TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

ARC EXTREME

Aged residential care needs of older adults with extreme obesity

School of Nursing, Midwifery, & Health Practice
Faculty of Health
2019

Collaborating Centres for
Safe Health Care

ACKNOWLEDGEMENTS

We would like to thank each of the aged care facilities who warmly welcomed and facilitated the presence of the research team. This research would not have been possible without your support. To all those who willingly gave their time to speak to the research team we thank you, your insights and experiences have helped us to construct a picture of the barriers and enablers of caring for older adults with extreme obesity. It is not possible to conduct research without funding and we thank Victoria University of Wellington for providing the financial means to undertake this research. Finally, the research team would like to acknowledge the support of the Faculty of Health and the School of Nursing, Midwifery, and Health Practice particularly Dr Kathy Nelson, *Senior Lecturer*, and Pam Green, *School Manager*.

This report was prepared by:
Dr Caz Hales (CH), *Senior Lecturer, School of Nursing, Midwifery, and Health Practice, Victoria University of Wellington.*
Dr Helen Rook (HR), *Lecturer, School of Nursing, Midwifery, and Health Practice, Victoria University of Wellington.*
Isaac Amankwaa (IA), *Research Assistant, School of Nursing, Midwifery, and Health Practice, Victoria University of Wellington.*
Lesley Gray (LG), *Senior Lecturer, Department of Primary Health Care & General Practice, Otago University, Wellington.*

FUNDING
This study was funded by Victoria University of Wellington, University Research Fund.

ADVISORY TEAM
Provider partner: Pakize Sari, General Manager of Te Hopai Home and Hospital, Wellington
Industry partners: Perry Robertson, NZ Operations Manager; Todd Bishop, Company Director, Essential Helpcare, Provider of specialised medical equipment
Consumer partner: Alyson Kana, Senior Policy Analyst, New Zealand Aged Care Association (NZACA)
Māori partner: Dr Lisa Te Morenga, Senior Lecturer in Māori Health, School of Health, Victoria University of Wellington

CITATION: Hales, C., Amankwaa, I., Gray, L., & Rook, H. (2019). ARC Extreme: Aged residential care needs of older adults with extreme obesity**.** Victoria University of Wellington, Wellington.

Published October 2019

FOREWORD

Tēnā koutou katoa

Thank you for the invitation to write the foreword to this timely and important report.

In 2018 our family was faced with the challenging task of supporting my beloved mother-in-law Ngaire to transition from living at her home (with a significant level of assistance) into aged residential care. Ngaire had had a tumultuous few years living with complex multiple morbidities (including increasing weight gain related in part to her limited mobility and increasing oedema) and frequent hospital admissions. She had required at times short periods in a local aged residential care service provider to stabilise medication changes and support mobility prior to returning home. However it became apparent that Ngaire needed a higher level of support than could be provided at home and plans were made for her to return to the same provider she had come to know and trust through those previous admissions.

However as reported by this research, this was not straightforward and the provider declined admission on the basis that they did not have the capability or capacity to safely care for Ngaire based on her increased weight – this was devastating for her and distressing for us as family. As a health professional with over 20 years hospital experience, I understand the challenges of caring safely for people living with extreme obesity however had not previously appreciated the impact of this in the aged residential care setting.

Discussions with my colleagues Drs Caz Hales and Helen Rook about our experience as a family throughout this process sparked questions that became the focus of this study. I hope that their recommendations are considered carefully and changes are made to support the increasing numbers of bigger bodied older adults who will find themselves in need of respectful and safe aged residential care support.

Ngaire would be very pleased to know that out of her significant troubles came the impetus for this careful examination of the issues and clear recommendations to support future improvements in care for others. We did eventually find a supportive and safe care facility for her, sadly however she passed away in August 2018. As health professionals working in partnership with families, the most important thing is that we provide the finest support we can based on the best evidence we can get – this report provides a significant contribution to that.

Ngā mihi
Dr Kathy Holloway

Associate Professor
Director of School of Nursing, Midwifery and Health Practice, Faculty of Health.
Victoria University of Wellington.

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

New Zealanders are living longer and many live with disabilities requiring care. With obesity rates increasing with age; 24% and 1% of adults aged 75 years and older are identified with obesity and extreme obesity, respectively. Aged Residential Care (ARC) facilities have a key role in caring for people who can no longer live on their own or with their families. It is widely known that extreme obesity (body mass index [BMI] of greater or equal to 40kg/m2), impacts upon people in these facilities, however caring for them brings challenges. To date New Zealand research exploring this population (obese/bariatric) group has focused on acute hospital management, and little is known regarding the ARC sector.

1.2 RESEARCH OBJECTIVES AND DESIGN

Aim: To establish the needs of ARC facilities to deliver best practice bariatric specific care for older adults with extreme obesity.

Objectives:

1. *To determine the barriers and enablers for best practice in the ARC setting for the care of older adults with extreme obesity*
2. *To establish the adequacy of infrastructure and equipment of ARC facilities to manage the care of older adults with extreme obesity*
3. *To understand the impact of different ARC financial models in caring for older adults with extreme obesity in ARC facilities*
4. *To describe healthcare professionals' specific educational preparation to provide bariatric specific care for older adults with extreme obesity in ARC facilities*
5. *To make policy and service recommendations to ARC facilities, District Health Boards and Ministry of Health.*

The setting for this study was three ARC facilities in the North Island of New Zealand. Each facility had a unique philosophy and business model. Facility 1 was a charitable trust, Facility 2 a privately listed company, and Facility 3 was a faith-based organisation.

Design: A collective case study approach was used with mixed methods. Standards to determine links with best practice were taken from multiple documents.

InterRAI data: Aggregated InterRAI data for all ARC facilities within New Zealand and separate facility data was used to provide context for the care needs of older adults with extreme obesity. The data presented are from 2015-2018.

Observational and interview data*:* One week was spent at each facility during which observations of infrastructure, equipment and layout were recorded. In addition, 28

facility staff were interviewed about care practices (10 in Facility 1; 9 in Facility 2; 9 in Facility 3).

1.3 MAIN RESEARCH FINDINGS

Despite a willingness by healthcare staff to care for older adults with extreme obesity, ARC facilities were not well equipped or ready to provide safe equitable care for this resident population. Key areas of concern for ARC facilities related to limitations in the infrastructure of current facilities, and financial barriers for Aged-Related Residential Care contracted services which incorporated equipment and safe staffing ratios.

Demographics of residents

Age:	*Mean* 86 years	*Range:* 44-105 years	
Gender:	72% Female	*Range:* 67.9-84.9%	
Ethnicity:	88.5% NZ European	1.5-1.8% Māori	0-1.5% Pacific Peoples

Obesity prevalence

More residents were overweight, obese and extremely obese than underweight in all three facilities (underweight 12.9%, normal weight 46%, overweight/moderate/ severe/extreme obesity 31.6%, missing data 9.5%) and this was comparable to the national trend in BMI ranges across all ARC facilities in New Zealand. The national prevalence of ARC residents with overweight, mild/moderate, severe and extreme obesity were 22.1%, 6.7%, 3.7% and 1.1%, respectively.

Infrastructure

In all three facilities there were infrastructure challenges that hindered the care of older adults with extreme obesity. None of the entrance doorways met the width requirements of 1.8m, ranging between 1.3-1.7m. Of the four randomly measured corridors, only two met the minimum dimension of 1.8m wide. With one corridor measuring 1.4m wide. The sizes of rooms measured fell far below the recommended bariatric dimensions of 25.3m^2. The largest room size measured was 13.9m^2. Ceiling hoists were noted in some rooms however, none of the hoists extended into the ensuite and none were multidirectional. There was poor access to ensuite facilities with door width of 0.8m; the recommended width to allow bariatric access is 1.5m. Overall the ensuite room size ranged from 1.3m^2 to 4.0m^2; minimum recommendations are 4.2m^2. All facilities had toilets positioned close to a corner of the ensuite, restricting movement of residents and caregivers assisting with the care.

Equipment

All three facilities had the ability to care for fully dependent (non-mobile) residents up to the weight of 120kg without having to procure additional equipment[i]. Beyond 120kg, each facility would need to procure different pieces of equipment and all facilities would

[i] The room size would still be inadequate to safely manoeuvre the mobilisation equipment and accommodate necessary extra staff.

need to procure a bariatric bed for any resident weighing over 170kg. For some residents, the physical dimensions of the person could mean a bariatric bed would be required for body weights considerably less than 170kg. This could be as low as 130kg. All facilities had issues with storage space of the larger pieces of bariatric equipment and there was limited equipment owned by the facilities and often, the more costly equipment such as a bariatric bed, was purchased by the resident.

Finances

The current government funding significantly impacted on the ability of ARC facilities to provide equitable care services for older adults with extreme obesity across all four components of the Aged Related Residential Care (ARRC) agreement contract for services (accommodation, everyday services, core care and support, and additional care and support). The financial risk for the provider acted as a deterrent for ARC facilities to accept older adults with extreme obesity into their facility; equipment procurement and safe staffing ratios were key barriers. Residents and family were often expected to contribute to care needs because of a resident's larger size and the financial implications for continued care.

Education

Staff identified a lack of education specifically around the clinical care needs of older adults with extreme obesity. Safe moving and handling were taught across all the facilities, but specifics related to moving a larger physical body were inconsistent across the three facilities. This was identified by many staff as a key educational need.

Decision-making

The decision-making process to accept an older adult with extreme obesity into an ARC facility was complex and multifaceted with a primary focus on the assessment of risk for the potential resident, staff and ARC facility. When making decisions, decision-makers considered the person's individual needs with regard to their general care and the acuity of other resident's currently living at the facility. Decisions focused around the assessment process at the time of referral, the care burden of the resident, occupancy of the facility and nearby facilities, the continued care needs and predicted increase in needs of the resident, funding limitations, and physical and human resources. Staff highlighted that the referral process was fraught with issues particularly around the sharing of information between the District Health Board (DHB) and ARC facility in relation to the specific care needs of the potential resident. There were real issues of safety concerns around the emergency management of older adults with extreme obesity.

1.4 CONCLUSION

Aged residential care facilities are unprepared to accommodate the existing and increasing number of New Zealanders who will require bariatric specific care. A significant government investment is needed to address the equity and care concerns of older adults with extreme obesity. This investment needs to address infrastructure, funding and workforce development. The healthcare workforce in this report demonstrated a high

degree of care and compassion despite the lack of resources and education available to them in caring for this resident population. Whilst only three ARC facilities were explored, the issues highlighted in regards to safety and equity are significant enough to warrant careful examination at a national level. In addition, further research is needed to understand the care needs of older adults who continue to be cared for in their own homes or community. There are implications of not addressing the concerns outlined in this research and these include: an increasing financial burden on the aged care sector; longer length of acute hospital stays; financial repercussions on older adults and their families/whānau; unsustainability of the aged care workforce and; further stigmatisation of people with obesity.

1.5 RECOMMENDATIONS

1. *The Ministry of Health needs to urgently review the national and regional capacity of ARC facilities to care for older adults with extreme obesity to identify who can accommodate this resident population, what physical and human resources (equipment and staffing) are needed and develop a plan for addressing the service gaps.*
2. *The Ministry of Health needs to urgently develop comprehensive New Zealand standards and infrastructure specifications for bariatric care within acute and community settings.*
3. *The Ministry of Health needs to develop a strategy for implementing bariatric specific infrastructure standards for all planned new and remodelling building work.*
4. *The Ministry of Health needs to review financial support for ARC facilities to upgrade existing buildings to meet bariatric specifications as part of a national and regional obesity strategy to address bariatric standards in different regions.*
5. *The Ministry of Health needs to urgently review ARRC service agreement funding arrangements (funding model) to ensure safe equitable care for older adults with extreme obesity. This agreement needs to include funding for the additional financial costs associated with bariatric equipment which is essential but not standard sized.*
6. *District Health Boards need to review hospital transition processes to ensure clear communication and decision-making pathways are in place to support timely transition of older adults with extreme obesity into an ARC facility.*
7. *The aged care sector in partnership with the Ministry of Health need to review the human resources that are required to safely care for older adults with extreme obesity.*
8. *The aged care sector in partnership with education providers and obesity experts should establish tailored education packages to meet the needs of the sector and older adults with extreme obesity.*
9. *ARC facilities need to review their infrastructure against the current standards outlined in this report. Consideration should be given to how facilities will go about meeting the standards in existing buildings and planned new building work.*
10. *ARC facilities need to review their existing and planned infrastructure in relation to the needs of bariatric populations to identify how service gaps can be addressed.*
11. *ARC facilities need to review and develop emergency management procedures that take into consideration the weight and size of their residents.*

GLOSSARY AND ABBREVIATIONS

ARC	Aged Residential Care
ARRC	Aged Related Residential Care
Bariatric	Describes a person with a BMI greater or equal to 40kg/m^2, or the subspecialty of health care practice for people with extreme obesity
BMI	Body Mass Index
DHB	District Health Board
InterRAI	A nationwide clinical assessment tool used by ARC facilities
kg	Kilograms
m	Metres
SWL	Safe Working Load
MELAA	Middle Eastern/Latin America/African
iHFG	International Health Facility Guidelines

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

2. INTRODUCTION

The New Zealand Health Strategy (NZHS)[1] guides change in the public health system. The strategy comprises two parts: NZHS Future Directions - highlighting strategic themes and challenges[1]; and NZHS Roadmap of actions 2016 identified 27 action areas[2]. Action 10 in the Roadmap sets out the need to provide support for older people with high and complex needs[2] and is provided in Appendix 1. One group of people with high and complex care needs, currently under researched and under resourced, is the older adult with extreme obesity.

The prevalence of obesity increases with age, and is of concern internationally due to the world's aging population[3]. Obesity coupled with advancing age has been associated with increased co-morbidities and declining functional abilities[4], leading to an increase in health service need. Whilst the needs of this specific older adult population has increased, service support within the Aged Care sector has largely remained unchanged[5]. This report presents findings of a study designed to examine the requirements of Aged Residential Care (ARC) facilities to deliver best practice bariatric specific care for older adults with extreme obesity. The implications for current care provision, and recommendations for the development of ARC services into the future will be discussed.

2.1 AGED CARE

Aged Residential Care within New Zealand refers to the variety of services provided to older persons who reside in the facility of the service provider and who require assistance on a regular basis because of declining physical and cognitive function[6]. ARC facilities comprise of Retirement Villages, Rest Homes and Private Hospitals with each facility offering different levels of care provision. There are four levels of care provision: Rest Home, Hospital (continuing), Dementia and Psychogeriatric[7].

Table 1 Levels of long-term care provision

Level	Care provision and resident need
Rest Home	Provide 24-hour care by trained staff. Older adults in rest homes can do some daily tasks themselves, but struggle to live independently in their own home
Hospital (Continuing)	Provide 24-hour healthcare for older adults with high clinical needs. Most residents cannot move without the assistance of another person, and need assistance to do most daily tasks
Dementia	Provide care to older adults with dementia or other mental illness. They provide the same services as rest homes in a secure environment and have staff trained in specialist dementia care
Psychogeriatric	Provide high levels of care for older adults with a very high level of dementia or challenging behaviours.

Source: New Zealand Aged Care Association (2018). Caring for older kiwis: The right place, at the right time. NZACA[7].

More New Zealanders are living longer and older people are more likely to live with a disability and or with a health burden of more than one long-term condition such as

diabetes, dementia, musculo-skeletal conditions and cardiovascular disease[1]. Each year around 33,700 people require ARC support in New Zealand. This number is estimated to increase to 58,000 people by 2024[8]. In conjunction with increasing acuity of older adults living with high and complex health care needs, ARC facilities must deliver appropriate care to meet those needs.

The existing funding model for ARC facilities was developed in the 1990s and a review has recently been released detailing seven primary recommendations and 16 areas for consideration[5]. Given the changing clinical profiles and care needs of older adults, the existing four categories of the funding model no longer accurately reflect these diverse needs with 90% of residents spanning across two care categories[5]. Residents such as those with extreme obesity and others with marked disability are costly to care for because of their need for specialist or additional equipment. Such residents could therefore be considered a financial risk for both DHB funders and providers of care services. Funding data related to ARC facilities within this report are based on the funding model and Aged-Related Resident Care service agreement contractual rates for 2018-9.

The Age-Related Residential Care (ARRC) service agreement is a national agreement that specifies the terms and conditions of ARRC services purchased by DHBs from individual ARC facilities[9]. These terms cover four components of care funding: 1) Accommodation, outlined as being a safe and appropriate physical environment; 2) Everyday services, identified as daily living requirements such as catering and laundry; 3) Core care and support, identified as regular ongoing resident care such as assistance with activities of daily living, care assessments, general practice visits, and administration activities by the ARC and allied health staff and; 4) Additional care and support, identified as episodic care above normal care needs for short periods of time such as rehabilitation, access to clinical specialist or end-of life care[5,9]. The national standards that ARC facilities need to comply with are audited against the ARRC service agreement.

2.2 PREVALENCE OF OBESITY IN NEW ZEALAND OLDER ADULTS

Overweight and obesity is becoming more common with obesity rates peaking in New Zealand in the 65-74 age group[10], as shown in Figure.1. The numbers of adults living with extreme obesity is increasing globally[11] and this trend is evidenced in New Zealand and amplified in Māori and Pacific Island populations[12]. The percentages of adults living with extreme obesity has increased in the 10 years since 2006 with around 198,000 people currently estimated to be living with extreme obesity in New Zealand[13]. Extreme obesity prevalence of around 6% is notable in age groups between 25-64 years[10], as shown in Figure. 2.

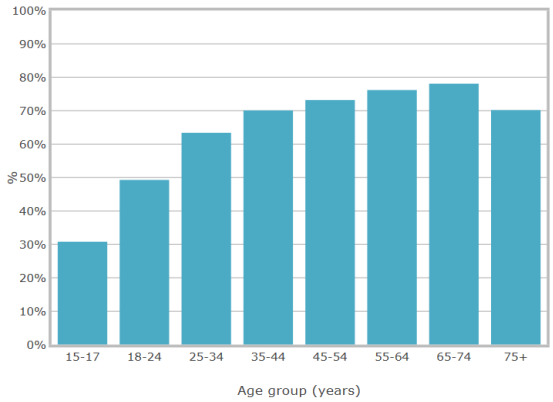

Figure 1 Overweight and obesity percentage by age

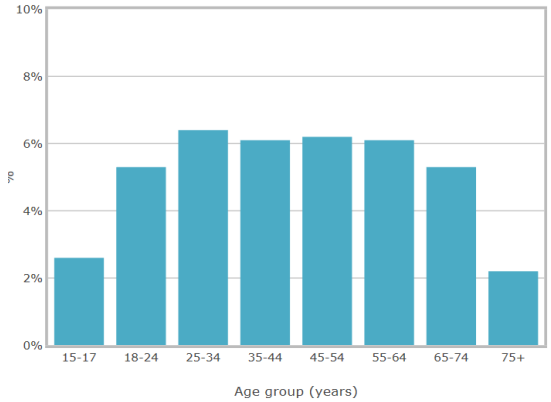

Figure 2 Extreme obesity percentage by age

Source: Ministry of Health. (2017). *Annual data explorer 2016/17:New Zealand Health Survey*[10].

People with high levels of obesity are more likely to develop chronic health conditions earlier in life leading to increasing numbers of individuals with complex care requirements in later life[14].

A range of terms are applied to the spectrum of obesity, classified by body mass index (BMI) which is a proxy for indirectly assessing body fat[14] and measures weight adjusted for height (Table 2). Extreme obesity involving bariatric care is classified for those people with a BMI at or over 40 kg/m^2.

Table 2 Body Mass Index (BMI)- Classification for adults

Classification	Class	BMI (kg/m^2)	Risk of co-morbidities
Under Weight		≤18	Not applicable
Normal weight		19-24	Average
Overweight (pre-obesity)		25-29	Increased
Obesity (mild/moderate)	I	30-34	Moderate
Obesity (severe)	II	35-39	Severe
Obesity (extreme, bariatric, very severe)	III + IV	≥40	Very severe

Source: Adapted from National Heart, Lung Institute[15] and Ministry of Health[14]

The BMI index is routinely criticised for being a rather blunt instrument as it does not distinguish between fat and lean muscle and does not provide information about how fat is distributed throughout the body[14]. Despite these limitations BMI continues to be the primary index utilised in international medical diagnostic coding and classification for adults and continues as the primary measure for global data on overweight and obesity prevalence[10,11].

2.3 OBESITY AND AGING

Obesity is known to exacerbate age-related decline in physical function[4], is strongly linked to declining mobility, and is a main risk factor for mobility disability[4]. In this older

population, extreme obesity has been associated with poorer lower extremity mobility[16,17], with activities such as self-care and moving around public places physically difficult or impossible[17]. Obesity specifically compromises walking, stair climbing and chair rise ability, especially if the BMI exceeds 35kg/m[16,18], with women disproportionately affected more than men[17].

Sarcopenic obesity, a chronic condition linked to aging, is of particular concern in the aging population as it is a result of progressive loss of muscle and strength with age combined with increases in fat mass[19] leading to frailty[20]. Despite sarcopenic obesity having been associated with deterioration in quality of life[21] and all-cause mortality[22], this condition continues to be largely undiagnosed, which can have significant consequences for the older adult and for healthcare provision[19].

2.3 BARIATRIC CARE NEEDS

The necessity to manage the unique needs of people with extreme obesity has driven the development of a sub-specialty of nursing practice known as bariatric nursing[23]. Specific health needs of this population group, regardless of age, include specialised equipment that supports the larger physical dimensions and weight of the person (bed, air mattress, chair, commode, shower chair), specialised moving and handling aids (ceiling and standing hoists, hoover mats, grip bars), and increased staff knowledge of specific clinical care needs (hygiene and toileting, nutrition, altered centre of gravity during mobilisation)[24].

Addressing the health needs of this population group when requiring hospital level care has been found to pose considerable healthcare delivery and resource utilisation challenges[25,26]. To date New Zealand research exploring this population (obese/bariatric) group has focused on acute hospital management[27–30], and little is known regarding the aged residential care sector. There is an urgency to understand the needs of ARC facilities to deliver best practice for this specific population when requiring hospital level care. This research will provide important evidence about how to improve access and service delivery at local and national levels for this older adult population.

3. RESEARCH OBJECTIVES AND DESIGN

3.1 AIMS AND OBJECTIVES

AIM: To establish the needs of ARC facilities to deliver best practice bariatric specific care for older adults with extreme obesity.

***Objectives**:*

1. *To determine the barriers and enablers for best practice in the ARC setting for the care of older adults with extreme obesity*
2. *To establish the adequacy of infrastructure and equipment of ARC facilities to manage the care of older adults with extreme obesity*
3. *To understand the impact of the different ARC financial models in caring for older adults with extreme obesity in ARC facilities*
4. *To describe healthcare professionals' specific educational preparation to provide bariatric specific care for older adults with extreme obesity in ARC facilities*
5. *To make policy and service recommendations to ARC facilities, DHBs and MOH.*

An important element of this project was partnership and as such a research advisory group was established. The group comprised of key partners influential in the aged care sector and the care of people with extreme obesity.
Membership included:

- *Provider partner*: Pakize Sari, General Manager of Te Hopai Home and Hospital, Wellington, was involved in the co-construction of the project including the design and development of the research, advisement on the InterRAI database and regularly consulted throughout the project.
- *Industry partner:* Perry Robertson, NZ Operations Manager; Todd Bishop, Company Director, Essential Helpcare, provider of specialised medical equipment had a key advisory role in the infrastructure and equipment specifications and requirements for best practice.
- *Consumer partner:* Alyson Kana, Senior Policy Analyst, New Zealand Aged Care Association (NZACA) who provided consumer and national interagency and policy perspective.
- *Māori partner:* Dr Lisa Te Morenga, Senior lecturer in Māori Health, School of Health, Victoria University of Wellington and Māori advisor who ensured responsiveness to Māori.

3.2 METHODOLOGY

3.2.1 Case study

The methodological approach taken in this study was collective case study. This approach allowed for the holistic exploration of the needs of ARC facilities to deliver best practice bariatric specific care for older adults with extreme obesity. Case study permits the description and exploration of the phenomenon of interest in the context of the real world[31]. This real world description was important given the need to understand from key stakeholders their thoughts on the barriers and enablers to best practice care of older

adults with extreme obesity. A collective approach allowed for the exploration of several cases (ARC facilities) to gain understandings of similarities and differences in the ability to care for residents with extreme obesity. A central element of case study methodology is the concept of a 'bounded system', the idea being that the boundaries are clear from the outset[31,32]. The facilities in this research related to one District Health Board region and all received government funded subsidies to support care delivery.

3.3 METHODS

3.3.1 Study setting and recruitment

The setting for this study was three ARC facilities in the North Island of New Zealand. Each facility had a unique philosophy and business model. Facility 1 was a charitable trust, Facility 2 a privately listed company and Facility 3 was a faith-based organisation. Because of the differing philosophies there was an opportunity for diverse perspectives to be garnered. The research advisory group deemed this approach important. Each facility was approached and in turn granted access to the research team.

Participant recruitment was purposive[33]. Carers who were directly involved in the provision of residents' care were invited to participate in the study. This included those who delivered regular direct care to the residents (nurses, health care assistants, and physiotherapists) and those involved in the operational aspects and the allocation of resources (facility managers, finance managers). The research team visited each facility, meeting with facility staff and communicated details about the intent of the study and its relevance to the sector inviting them to participate. In addition to the face-to-face meetings, a facility wide email was sent on behalf of the research team and poster displays in shared spaces that explained the study were used to notify facility staff about the project. The only exclusion criteria was non-consent.

3.3.2 Data collection

Case study methodology enabled the use of a combination of methods as well as multiple forms of evidence to understand the preparedness of ARC facilities. Four sources of data were used; including spatial measurements, InterRAI dataset review, resident profile data, and interviews with staff. The approach to data collection was flexible with up to three members of the research team on site attending to different aspects of the data collection at any one time. Data collection took place between March and June 2019 with a minimum of one week spent in each facility.

In preparation for taking spatial measurements, the research team developed an observational tool to facilitate the easy measurement of space within the facility. Spaces measured included: disability and ambulance parking, facility entrances, emergency exits, lift spaces, corridors, bedrooms, toilet and hygiene areas, and lounge and dining areas. The width, length and ceiling height of each space was measured. Where appropriate the room size was captured in metres squared. Available equipment was also documented in the observational tool. Equipment specifications including the safe working load was recorded. Equipment specifications were validated with equipment providers.

To ensure the accuracy of measurement several strategies were employed. The tool was tested independently by each member of the research team. The research team then met and compared measurements. Some adjustments were made to ensure that each member of the team was using the laser measuring device accurately and measuring from the same point. When measurements were taken at facility level at least two members of the research team were present to ensure accuracy.

Approval was sought via the Central Region's Technical Advisory Services (TAS) to access the InterRAI dataset with subsequent approval granted in April 2019. National level data as well as facility level data was collected. The data provided by InterRAI New Zealand was anonymised, so individuals could not be identified, however, the three research sites gave authorisation to have access to de-identified data about their facilities. Whilst InterRAI data has been frequently analysed, the intent of this analysis was to specifically identify the prevalence and clinical profile of older adults with extreme obesity residing in ARC facilities.

Profile data was gathered at each facility. Staffing information included, the number of staff employed at the facility, staff to resident ratios, staff turnover, vacancy rates and shift patterns. Facility characteristics included occupancy rates, numbers of rest home, hospital and other beds including dementia or serviced apartments, business models, model of care, the number of premium and standard rooms, cost breakdown of rooms and any additional charges for care. A standard form for collecting this data was developed and each facility manager completed and validated the information.

Twenty-eight facility staff (9 Registered Nurses, 1 Enrolled Nurse, 9 Healthcare Assistants, 2 Physiotherapists, 6 Facility/Clinical managers) were interviewed (10 in Facility 1; 9 in Facility 2; 9 in Facility 3). The approach to interviewing was semi-structured. An interview schedule guided the interview process ensuring that the same questions were asked of each interviewee. Using a semi-structured approach meant the research team could modify how questions were asked depending on the context of the conversation and nature of the person's role. Each interview was audio recorded and later transcribed.

3.3.3 Ethical considerations

Te Tiriti o Waitangi recognises the Māori people are the tangata whenua of New Zealand. While Māori are underrepresented in the aged residential care sector, Māori consultation provided important partnership with Māori. Ethical approval was sought and granted by Victoria University of Wellington Ethics Committee (Approval Number 27169). When on site at each facility researchers were aware that they were in people's home and took care not to interrupt facilities' daily routines. Residents whose rooms were measured gave permission and could be present when this was done. All interviewees were given a detailed information sheet about the study and its intended outcomes. The information sheet had a statement about the voluntary nature of participation and the right to withdraw from the study at any time without prejudice. All data gathered during the study was stored securely either in a locked cabinet or electronically password protected. The data has been viewed by the research team only. The transcriber signed a confidentiality

agreement. Names of the facilities and those interviewed have been de-identified to protect confidentiality.

3.2.4 Analysis

Each of the facility's profile data, spatial measurements, interview data, and InterRAI data was analysed separately. This was followed by a cross case analysis to identify the similarities and differences across cases[33]. This triangulation[ii] of findings highlights similarities and differences across the care provision in the facilities leading to a detailed examination of both the phenomena of bariatric care and the context within ARC facilities.

Best practice guidelines and standards were used to assess the infrastructure and care practices within the facilities. We identified some guidelines relating to the design of health facilities in New Zealand (e.g. Moving and Handling People: The New Zealand Guidelines, published by Accident Corporation Company, 2011)[24] and Australia (e.g. A Guide to Designing Workplaces for Safer Handling of People, by Worksafe Victoria, 2007)[35]. However, specific guidelines for bariatric clients were limited in both New Zealand and Australian guidelines, therefore we referred to evidence from the United States (e.g. Bariatric Safe Patient Handling and Mobility Guidebook, published by VHA Center for Engineering & Occupational Safety and Health, 2015[36] and Guidebook for Architects and Planners: Functional Design for Mobilisation and Ergonomics published by ArjoHuntleigh[37]). While measures have been taken to ensure that this report is sensitive to the variances within New Zealand context, the reader should be aware that these are interpretations of international evidence.

NVivo 12 computer software (QSR, International, Burlington, MA) was used to facilitate the management of interview data coding and analysis and provided an audit trail of coding decisions. Content analysis was undertaken independently by CH, HR and LG to examine and ensure consistency in the coding of interview data. This approach is regarded as a flexible method for analysing text data as well as being a pragmatic method for the development and extension of knowledge[38]. Content analysis is largely deductive however, it goes beyond the counting of words to an intense examination of language for the purposes of classifying large amount of text into several categories[39]. A central feature of qualitative content analysis is the creation of categories[40]; descriptive statements that describe the manifest content of text, and the visible and obvious components of the text[40]. Interviewee responses were aligned to the specific questions they were asked using the semi-structured interview schedule.

Numerical data were analysed using SPSS version 24. De-identified baseline characteristics of residents obtained from InterRAI database were examined by age, sex, ethnic group and underlying clinical condition using descriptive statistics such as proportions and means. Differences in baseline characteristics of the three ARC facilities

[ii] Triangulation refers to a practice of using multiple sources of data or multiple approaches to analysing data to enhance credibility of research[34].

were assessed by one-way analysis of variance (ANOVA) and Chi-square tests for continuous and categorical variables, respectively. Point estimates of individual facility scores for required spaces, equipment and staff were calculated and compared with baseline and demographic data from InterRAI. All statistical tests were conducted at a significance level of $p = \leq 0.05$.

3.2.6 Credibility and trustworthiness

Data trustworthiness relies on four elements: credibility, dependability, confirmability and transferability[41]. Credibility was established through triangulation of data, asking the same questions of different interviewees and the collection of different types of data from each of the ARC facilities. Cross checks such as second coding of transcripts by different members of the research team add to data credibility. Data dependability refers to the ability to replicate the study. As a research team we kept an audit trail capturing the rationale for methodological decisions as well as contextual data[42]. Ensuring that research findings reflect interviewees' views is confirmability. This was done by outlining how our interpretations were arrived at ensuring the neutrality and accuracy of the data. Where there was uncertainty in our interpretation, we sought clarification from either the interviewee or facility managers.

Even though the research is limited to three facilities, the purposeful selection of three different business models and the detailed description of their philosophies and of the findings has been provided with a view to support transferability of findings. It is anticipated by the researchers, that readers and other providers of aged residential care facilities will be able to relate and utilise the findings even though the study did not involve them.

4. FINDINGS

The findings of this research are presented in three sections. The first section presents the characteristics of each ARC facility. The second section presents the InterRAI data for all ARC facilities within New Zealand, and how national data relates to each facility, to provide context to the care needs of older adults with extreme obesity. The data presented is from 2015-2018. The third section presents the specific findings from the three ARC facilities related to extreme obesity. This data provides the findings on the preparedness of the three facilities to provide safe, equitable care for older adults with extreme obesity. Given this layout, the datasets for each facility in sections one and three do not directly align with section two and should be treated as discrete datasets.

4.1 FINDINGS AT A GLANCE

Resident characteristics affect their bariatric care needs as well as the level and type of staff and equipment resources required. While all residents in the three facilities require support in meeting their functional needs, bariatric residents may have greater levels of need and modification of the care environment. Residents in the three facilities represented an aged population (mean 86yrs; range 44-105) and were predominantly female (72%), with most identifying themselves as Europeans (88.5%). Dementia, Alzheimer's disease and stroke formed the commonest primary diagnosis within the study period.

Obesity prevalence

Outside of the normal BMI range, more residents were overweight, obese and extremely obese than underweight in all three facilities (underweight 12.9%, normal weight 46%, overweight/moderate/ severe/extreme obesity 31.6%, missing data 9.5%) and this was comparable to the national trend in BMI ranges across all ARC facilities in New Zealand. See appendices 2A, 2B and 2C for demographic and anthropometric characteristics stratified by facility, national aggregated data and DHB region.

Infrastructure

None of the three facilities met all current standards for bariatric care building specifications. In all facilities there were infrastructure challenges that would hinder the care of older adults with extreme obesity. None of the entrance doorways met the width requirements of 1.8m, ranging between 1.3-1.7m. Of the four randomly measured corridors, only two met the minimum dimension of 1.8m, and one corridor measured only 1.4m wide. The sizes of rooms measured fell far below the recommended bariatric dimensions of 25.3m^2; the largest room size measuring only 13.9m^2. Ceiling hoists were noted in some rooms however, none of the hoists extended into the ensuite and none were multidirectional. There was poor access to ensuite facilities with door width of 0.8m; the recommended width to allow bariatric access is 1.5m. Overall the ensuite room size ranged from 1.3m^2 to 4.0m^2; minimum recommendations are 4.2m^2. All facilities had toilets positioned close to a corner of the ensuite, restricting movement of residents and caregivers assisting with the care.

Equipment
All three facilities had the ability to care for fully dependent (non-mobile) residents up to the weight of 120kg without having to procure additional equipment. Beyond that body weight, each facility would need to procure different pieces of equipment and all facilities would need to procure a bariatric bed for any resident weighing over 170kg. It is noted however, for some residents, the physical dimensions of a person can mean a bariatric bed would be required for body weights considerably less than 170kg[28].

Finances
The current government funding model significantly impacted on the ability of ARC facilities to provide safe and equitable care services for older adults with extreme obesity in all four components of the ARRC agreement contract for services (Accommodation, Everyday services, Core care and support, and Additional care and support). The financial risk for the provider acts as a deterrent for ARC facilities to accept older adult with extreme obesity into their facility; with equipment procurement and safe staffing ratios as key barriers. In all facilities, residents and family were often expected to contribute to care needs because of the resident's larger size and the financial implications for continued care.

Education
Limited education regarding the clinical care needs of older adults with extreme obesity was available for staff. Safe moving and handling was taught in all the facilities but specifics around moving a resident with a larger physical body were inconsistent across the facilities. The need for more targeted education was identified by many staff as a key educational need.

Decision-making processes
The decision-making process to accept an older adult with extreme obesity into an ARC facility was complex and multifaceted with a primary focus on the assessment of risk for the potential resident, staff and ARC facility. When making decisions, the decision-makers considered the person's individual needs regarding the general care needs and acuity of other resident's currently living at the facility. Decision-making around emergency management raised serious concerns for staff.

4.2 SECTION 1: CHARACTERISTICS OF THE FACILITIES

4.2.1 Facility characteristics
Although operating within a different business model, each facility had explicit value statements that reflected the nature and history of their organisation and included concepts like respect, compassion, holism and excellence.

The history of the buildings used by the facilities was unique. The charitable trust was purpose built for aged care and did benefit from a recent new building extension purposely designed to cater for older adults in need of hospital level care. However, extreme obesity was not considered in the planning stage. The faith-based facility was

operating from a building that was originally designed for a variety of purposes other than aged residential care. This lack of purposeful design has led to a series of adaptations and modifications, many of which are ongoing. The publicly listed facility operated from a purpose-built building. However, the facility was outdated and did not meet the specification requirements that its current owner uses as part of all newly constructed buildings.

Facility size ranged from 57 to 153 beds. Facility 1 had 150 beds, this was broken down into 29 rest home beds, 16 specialised dementia beds and 105 hospital beds. The total number of beds in Facility 2 was 153, 58 rest home beds, 58 hospital beds and 37 serviced apartments and studios. Facility 3 was small in comparison. It had 57 beds; all of which were classified as *swing beds* meaning they could be either hospital or rest home beds, at the time of the research there were 28 rest home beds and 24 hospital beds in use. Occupancy rates ranged from 97.2% in Facility 1, 95.9% in Facility 2, and 80.0% in Facility 3.

In Facility 1 there was a distinction made between premium versus standard rooms. In Facility 1 all rooms had an ensuite and what differentiated standard from premium was the size of the room. For facility 2 all room were categorised as premium rooms with a cost variance between these premium rooms based on the vista. This will be further discussed in Section 4.3.3. Facility 1 had 63 premium rooms, Facility 2 had 116 premium rooms and Facility 3 did not operate any premium rooms.

Each facility operated using a volunteer workforce as well as permanent and contracted employees. Annual staffing turnover ranged from 3.7% (Facility 3) to 20.0% (Facility 1), to 33.0% (Facility 2). Facilities 1 and 3 were actively recruiting at the time of the research. Facility 1 and Facility 3 employed Diversional Therapist 5.0 FTE (7 people), and 1.3 FTE (2 people), respectively. Facility 2 also employed a diversional therapist and had several activity coordinators. Facility 3 was the only facility that did not have contracted physiotherapy hours or an appointed physiotherapist assistant. Facility 1 had 29 contracted hours for physiotherapy services as well as a 0.8 FTE (1 person) appointed physiotherapist assistant. Facility 2 had 20 contracted hours for physiotherapy services and 1.0 FTE (1 person) for a physiotherapist assistance.

The model of care espoused at Facilities 1 and 3 was team nursing and in Facility 2 it was primary nursing. All facilities had rostered and rotating shift patterns. There was a slight variance between these to allow for customised care. A further breakdown of staffing characteristics and staff to resident ratios is outlined in Table 3.

4.3 SECTION 2: DEMOGRAPHIC DATA

4.3.1 Use of ARC care services by age, gender and ethnicity

In 2015-2018, the age of residents in the three facilities ranged from 44 to 105 years, with a mean age of 86 (±7.8) years. Residents in Facility 2 recorded a significantly higher mean age of 87±7.6, compared to Facility 1 (85±8.0) and Facility 3 residents (86±7.4). This

finding is consistent with the national data analysed (InterRAI, 2015-2018), which saw most residents aged 60 years and above, with 19.3%, 44.1% and 28.9% being 70-79 years, 80-89 years and ≥90 years, respectively. The three facilities residents were predominantly female (71.8%); a proportion slightly higher than the national figure of 65.7%. Most residents identified themselves as European (88.5%), followed by Asian (7.3%), Māori (1.8%) and Pacific peoples (1.2%). The percentage of residents identifying as Māori was 2.8%, lower than the national figure of 4.6% (Table 4).

Table 3 Staffing Characteristics

Characteristic	Facility 1	Facility 2	Facility 3
RN Ethnicity*	Asian, Middle Eastern, Latin American and African (MELAA), European	Indian, Philippines, New Zealand European	Philippines, Africa, Pasifika.
HCA Ethnicity	Asian, European, Pasifika, MELAA	Indian, Philippines, New Zealand European, Samoan, Pasifika	Maori, Pasifika, Philippines
FTE RN (Actual)	25 (24 plus 2 ENs)	11 (17)	10 (9 plus 2 ENs
FTE HCA (Actual)	75 (81)	25 (53)	30 (28)

*Ethnicity was not specifically recorded at every facility therefore; general ethnicity data has been reported.

Table 4 Percent distribution of ARC services users by age, gender and ethnicity; InterRAI, 2015-2018

item	Variables	National (N=224,200)	Total (N=2,348)	Facility 1 (n=1,305)	Facility 2 (n=838)	Facility 3 (n=205)
A	**Age in years**					
1	Mean ± SD	-	86±7.8	85±8.0	87±7.6	86±7.4
2	Range	-	44-105	44-105	50-104	63-102
B	**Sex (%)**					
3	Male	**34.3**	28.2	32.1	25.4	15.1
4	Female	**65.7**	71.8	67.9	74.6	84.9
C	**Ethnicity (%)**					
5	European	**90.1**	88.5	86.6	90.3	93.2
6	Māori	**4.6**	1.8	1.8	1.8	1.5
7	Asian	**2.5**	7.3	9.1	5.7	2.4
8	Pacific people	**1.8**	1.2	1.5	1.1	0
9	MELAA*	**0.5**	0.8	0.5	0.8	2.0
10	Other	**0.8**	0.4	0.4	0.2	1.0

* *MELAA means Middle Eastern/Latin America/African*

4.3.2 Health and functional characteristics of ARC facility users

Disease diagnosis

Figure 3 shows the disease profile of the residents in the three facilities. These diagnoses have been grouped as: 1) primary diagnosis; 2) diagnosis present, receiving active treatment and; 3) diagnosis present, monitored but no active treatment. Dementia

(30.3%) was the most prevalent primary diagnosis, followed by Alzheimer's (9.3%), stroke (8.5%) and heart diseases (8.1%). Heart disease (20.3%), chronic obstructive pulmonary disease (11.0%) and stroke (7.4%) were the conditions that mostly received active treatment. Dementia, though most prevalent, was mostly monitored (just 1.1% of residents with dementia were receiving active treatment). See Appendix 2A for aggregated national data on disease, diagnosis and treatments for residents' current stay.

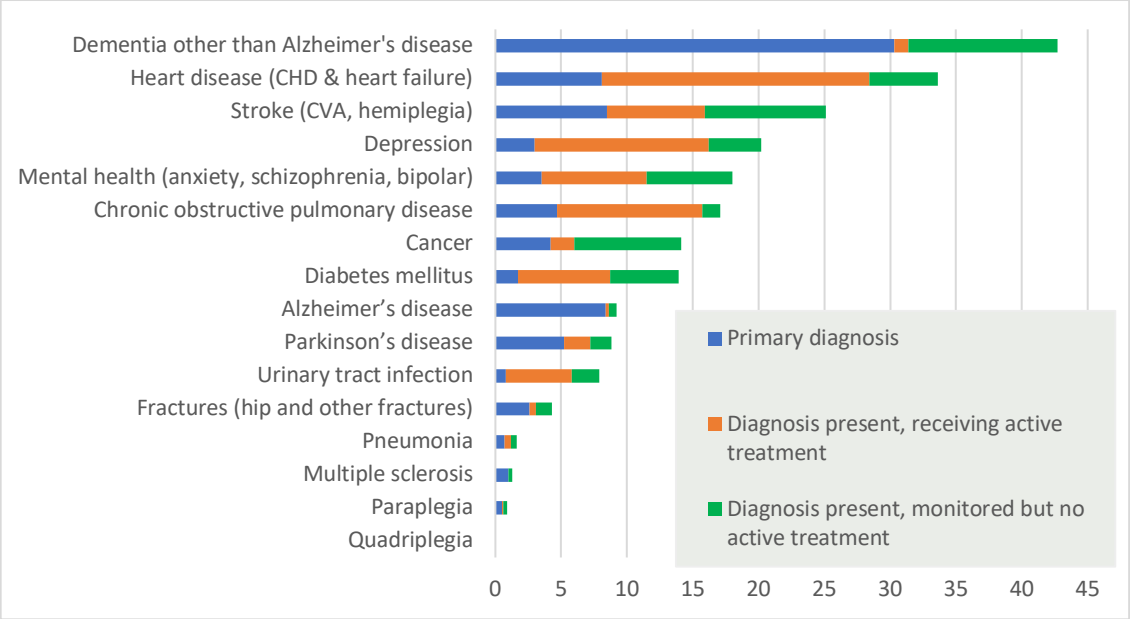

Figure 3 Diseases reported by the three ARC facility residents. [43]

4.3.3 Obesity prevalence by facility type

The mean weight and height of residents in the three facilities were 62.8±16.9 kg and 162.1±12.0 cm, respectively (Table 5). The prevalence of overweight, mild/moderate, severe and extreme obesity for residents in the facilities was 22.1%, 6.7%, 1.7% and 1.1%, respectively. These figures are significantly lower than the national proportion of residents classified with overweight (26.6%), mild/moderate obesity (11.3%), severe obesity (3.7%) and extreme obesity (1.7%) (InterRAi, 2015-2018). More residents (46%) in the three facilities fell within normal healthy weight compared to the national proportion of 37.7% (Table 5). Nationally, significant differences were observed in the anthropometric characteristics amongst the 20 DHB regions. The mean weight differs significantly between the regions with the highest and lowest mean weights observed in Midland region 67.0 (16.0) kg and Northern region 65.4 (15.8) kg, respectively. See appendices 2B, 2C, and 2D for demographic and anthropometric characteristics from a facility, national and DHB level.

Table 5 Description of the anthropometric parameters of residents in the three ARC facilities, compared to national figures; InterRAI, 2015-2018.

Item	Variable	National (N=224,200)	All 3 Facilities (N=2,348)	Facility 1 (n=1,305)	Facility 2 (n=838)	Facility 3 (n=205)
A	**Weight (kg)**					
1	Mean	*67.0*	62.8	62.0	63.6	62.9
2	Min/max	*24-264*	31-180	32-138	31-179	41-180
	Missing	*15,855*	*108*	*44*	*55*	*9*
B	**Height (cm)**					
3	Mean	*163.5*	162.7	162.5	163.6	160.7
4	Range	*143-213*	140-194	142-198	140-194	140-182
5	*Missing*	*21,258*	*190*	*130*	*63*	*11*
C	**Calculated BMI (%)**					
6	Normal weight	*37.7*	46.0	45.1	47.1	46.8
7	Overweight	*26.6*	22.1	20.2	21.8	34.6
8	Mild/Moderate obesity	*11.3*	6.7	8.2	4.5	6.3
9	Severe obesity	*3.7*	1.7	1.6	2.3	-
10	Extreme obesity	*1.7*	1.1	0.8	1.7	1.0
11	*Missing/not calculated*	*9.4*	*9.5*	*10.8*	*8.4*	*5.9*

4.4. SECTION 3: OBSERVATIONS OF ARC FACILITIES

4.4.1 Infrastructure

The bariatric population, although currently small in numbers in ARC facilities (approximately 570 residents per year)[iii], is expected to increase in the coming years. ARC facilities accommodate residents from admission until the end of the resident's life. During this period, residents typically experience deteriorating health status, including decreased mobility and its associated increase in weight. We assessed the current infrastructure of the facilities and how they could meet the needs of the increasing numbers of bariatric population. In this section of the report, we report on our review of the extent that the entrances and routes, resident rooms, toileting and hygiene facilities and lounges meet bariatric best practice standards contained in the literature.

Entrances and routes

Accessibility

Design of ARC facilities must provide ease of access, and this begins from the outside of the facility[44]. Car parks and drop off points in the three facilities were directly connected to the facility entrances by short, accessible paths that were clear, and slip-resistant as recommended for all health facilities[45,46]. Designated disability parking spaces were

[iii] Number of residents with extreme obesity based on the data that 33,700 people require aged care support each year[8]

observed at all facilities, these were mainly at 90^0 to the kerb, the ideal angle for accessible carparks[47]. The widest disability park was 0.4 metres (m) wider than the recommended 3.5m[48], while the narrowest park, measured 2.5m. Length of disability parks was of concern in all facilities, as 3 out of the 4 measured parks had dimensions that fell below the 5-metre recommended by Standards New Zealand[48]. See Appendix 3A: Disability and Ambulance Parking, for detailed parking space measurements. Only one facility had a designated ambulance park. Crook[49] advised that a building's entry points need to be designed with comfortable ramps with handrails. Worksafe Victoria[35] however, advises against the use of ramps where possible, as these can present hazards to carers and individuals in manual wheelchairs in view of the forces required to push the wheeled equipment. Reflecting this recommendation, only one ramp was observed at an entrance, where this was observed to be appropriate for the topography at that facility. Visibly missing in all the main entrances were hand or hand grab attachments.

Doorways

A conventional hospital entryway is usually 2 metres (m) high and 1.8m wide (p. 261)[24,iv]. The height of main entranceways in all facilities met the minimum height requirement (range 2-3.4m), but none met the minimum width requirement of 1.8m (range 1.3-1.7m). For bariatric purposes, this is an obvious structural deficiency unlikely to facilitate use of bariatric equipment (e.g., bariatric beds). Automatic opening, wider doorways that accommodate manoeuvring of large bariatric equipment has been recommended[24,35,37,50]. Main entrance doorways measured in all facilities had an outer and inner door. All doors were automatic apart from the inner door on Facility 3 that was manual and needed to be held open. See Appendix 3B: Facility Entrances, for detailed entranceway measurements.

Interviewees were aware of the need to enlarge doorways to accommodate larger beds and other equipment; "*We need a bigger door. Everything is affected. It's like a domino"* (Facility 2, interviewee 5).

Designated emergency exits were also measured and ranged from 1.0m-1.4m wide. Collier[51] recommends an emergency exit door width of 1.25m. Of the four exit doors measured only two emergency exits met the 1.25m minimum requirement. Additionally, three doors had obstructed access that would affect residents with restricted mobility exit in an emergency situation. See Appendix 3C: Emergency Exit Doorway, for detailed measurements.

Corridors

Along corridors, two wheelchairs and a mobile walking device should be able to pass without the need to move furniture. For this to happen, ArjoHuntleight[37] and ACC[24] recommend minimum passage dimensions of 1.2m and 1.8m respectively. However, in cases where it is anticipated that residents would be wheeled in their beds (and this is likely to coincide with a passing wheelchair), the recommendation is that the passing

[iv] Also read the International Health Facility Guidelines, Version 4, (2015) p. 29.

space is increased to 2.2m or even 2.4m if two beds are expected to pass each other in a corridor[24,37,52]. Of the four randomly selected corridors in this study, only two met the minimum dimension of 1.8m (range 1.2-2m). See Appendix 3D: Corridors, for detailed corridor measurements. In addition to ensuring wider corridors, the Australasian Health Infrastructure Alliance[52] recommends a minimum corridor heights of 2.4m to allow for high beds with the mattresses and large slings needed for bariatric patient management. Also identified in the three facilities was an apparent reduction in the width of the corridors by the presence of removable items such as mobile hoist, vital signs apparatus and chairs. In one facility, we observed fixed laptop holders that protruded significantly into a corridor.

Flooring

A bariatric bed (est. bed weight 285kg) and other bariatric equipment can be very heavy and therefore ARC facilities require flooring capacity that can endure such weight while allowing for a great degree of manoeuvrability of wheeled equipment[37,52]. We observed a mixture of flooring across all facilities, with commercial carpets being the predominant floor covering in residents' rooms and communal areas. Facility 2 had slip resistant tiles in the entranceways, and standard vinyl coverings in wet floor areas such as ensuites and bathrooms. Vinyl as a flooring material is recommended in the *Bariatric Safe Patient Handling and Mobility Guidebook*[36] and by the *Australian Health Infrastructure Alliance*[52] to be used on hospital floors. It provides the minimum rolling friction to wheeled equipment including beds, all trolleys, wheelchairs and hoists. In one facility, we identified two separate mats in front of the entrance. Additionally, several lips and joins, especially where old and new structures met were identified. For bariatric clients who typically struggle to see the floor in front of them, this and other elevations can pose trip hazards[35].

Internal fixtures (e.g. handrails)

To improve independence, Strongwater and Becker[46] advocate installing grab bars/rails on all surfaces, especially the corridors. Worksafe Victoria[35] further advises that these grab rails should be continuous around corners and for the full length of the corridor, where possible. Continuous grab rails were a common feature in Facilities 1 and 3, but not present in Facility 2. Alcoves or seating areas where bariatric clients can sit was observed in only one facility. Interviewees interviewed in Facilities 2 and 3 commented on the unlikely feasibility and retrofitting of handrails relating to corridor size and in relation to existing building infrastructure:

> *Our hallways are small.* (Facility 3, interviewee 6)

> *I am not sure that it would be feasible in this particular facility. And my reasoning around that is our size of our corridors, for a start.* (Facility 3, interviewee 7)

> *Retrofitting also depends on facility infrastructure – Handrails, we'd need to reinforce all the walls, because anything that you put pressure on will just easily cave -- fall away.* (Facility 2, interviewee 2)

Resident rooms

The size of residents' bedrooms measured in this study ranged from 9.5m^2 to 13.9m^2. See Appendix 3E: Patient Areas-Bedroom, for detailed resident room measurements. Even though these measurements are within the recommended dimensions for standard hospital rooms, none met the recommended bariatric room requirements. To accommodate obese residents, bariatric patients' rooms need extra space to allow for larger beds and family members who are often larger. The American Institute of Architects (AIA) recommends adding 9.3m^2 to the conventional inpatient rooms, leaving 1.5m clear space around beds[36]. An American manufacturing company (Hill-Rom) also recommended that bariatric rooms should be at least 25.3m^2 [49,53] compared to the average room size of 16.4m^2. This additional room is to allow 1.5m of clear space around three sides of the resident's bed to provide adequate room for wheelchairs, walkers, and portable patient lift [35,50,53],[v]. Many of the interviewees across the three facilities commented upon the size of rooms:

> *We have got a few rooms downstairs that we -- would cater for them, if they're available.* (Facility 1, interviewee 7)

> *I'm not sure if bariatric was one of their [managers/owners] like main aims or goals to address, but [Facility name], which is a purpose-built building, they have really big rooms, like I think you can -- you can park two, three hoist in like the -- near the bed, and that would be -- there's still plenty of room for…* (Facility 2, interviewee 7)

Toileting and Hygiene facilities

All residents in Facilities 1 and 2 had access to a private ensuite[vi]. Residents in Facility 3 had to share a toilet with the resident in the adjacent room or use a shared bigger bathroom located on their floor. See Appendix 3F: Toilet and Hygiene Areas, for detailed measurements and additional information relating to hygiene amenities and characteristics in each facility. Facility 3 interviewees noted issues relating to toilet facilities in terms of existing infrastructure, shared facilities, dignity and space:

> *There's a nominated toilet, but it's shared, it is too tiny. The toilet is not adaptable, is not even possible for a hospital-level care that requires a person assistance to go to the toilet. The -- what is happening at the moment is that we have a commode chair inside the patient's room, and it is just undignifying.* (Facility 3, interviewee 6)

---

[v] Bariatric room design suggestions can be found in the 2014 ArjoHuntleigh (pp. 56-68) *Guidebook for Architects and Planners: Functional Design for Mobilisation and Ergonomics* (ArjoHuntleigh, 2014). The guidebook provides useful drawings that demonstrate the space requirements at the bedside based on client's mobility and functional status.

[vi] For the purposes of this research an 'ensuite' is defined as an adjacent room with a toilet and shower facility.

My main thing is the -- is the -- and our bathroom situation. The toilets in between rooms, that -- so there would be quite an extensive remodelling process. Which wouldn't be viable, I don't think -- the bathrooms are so tight, you would never get an assisted person. (Facility 3, interviewee 7)

Ensuites

All ensuites were directly linked to bedrooms. In such situations, the international health facility guidelines recommend that a heavy capacity overhead tracking or a ceiling hoist that connects directly between the bedroom and the ensuite should be provided. This is to reduce the need to transfer the resident several times during care[54]. None of the facilities had this equipment, though we identified some bedrooms with ceiling mounted hoists. The Bariatric Room Design Advisory Board (BRDAB) recommends sliding doors with an opening space of 1.5m[44]. Only one facility had a cavity sliding door with a width of 0.8m; 0.7m less than the recommended 1.5m width. Unsurprisingly, the research team rated this cavity sliding opening as obstructing residents' access 'a great deal'. The ensuite with the widest width (0.9m) measured in Facility 2 was not a sliding type but opened outwards, a door opening recommended by Standards New Zealand[48]. Doors that open into a room usually obstruct care activities due to the space it takes, and this was observed in Facility 3, where we measured the smallest width of 0.6m.

Predominantly, Facilities 1 and 2 had combined the shower and toilet into a central bathroom or an ensuite. The BRDAB recommends a minimum ensuite size of 4.2m^2 to accommodate two caregivers and any special equipment that would be needed[44,55]. None of the facilities met this criterion. The largest and smallest ensuites measured were 4.0m^2 and 1.3m^2, respectively. Showers were wet room type, with no enclosing walls around. This type of enclosure is an important bariatric design consideration as it ensures an unrestricted movement of residents and caregiver assisting with the care. Fixtures such as toilets, sinks and grab rails should be strategically placed to allow more room for movement. For example, toilets should be situated close to the centre of the room, about 0.6m away from the back wall[49]. Worksafe Victoria[35], p. 268 reported 'A common design error in New Zealand health facilities is to place toilets in corners of bathrooms, with the backs of the toilets too close to the walls'. All facilities had toilets positioned close to a corner of the ensuite. Additionally, grab bars and paper dispensers were mounted just at the level of the hip area. According to VHA Centre for Engineering and Occupational Safety and Health[36], placing at this height could cause skin damage to residents, especially those with an excessively wide hips. Further, bariatric guidelines require toilets to be wider (about 1.1m), floor mounted and rated with higher weight capacity[49] than the standard ceramic toilets observed in this study. Toilets were mostly floor-mounted while sinks and grab rails were wall-fixed. To support bariatric clients weighing up to 363kg or more, walls mounted with sinks, toilets and grab bars need to be reinforced[49,55]. This requirement could not be explored in this study as building work specifications of this detail were not available.

Lounges

Three lounges were assessed in each facility. See Appendix 3G: Lounge and Dining Room, for detailed measurements. Doors into lounges were mostly manually operated that opened away from the lounge. They offered little to no obstruction to residents' movement. Lounges usually served as day room, waiting area and a place where residents dine. Lounges were mostly large spaces, with the largest measuring 205.1m^2. Weight capacity of chairs in the lounges was not available, but chairs were mostly a mixture of recliners and standard chairs. We did not identify bariatric rated chairs in any of the facilities, but rather, basic chairs with arms. These chairs do not offer the space and support required by bariatric residents and their relatives, who often feel reluctant to sit for fear of not fitting or breaking the furniture. Strongwater and Becker[46] recommends modifying existing seats to support bariatric clients. While doing this, Gallagher and Steadman[56] caution against creating an 'obese only' area in a facility. To address this issue ArjoHuntleigh[37] and Crook[49] suggest facilities have 10 to 20 per cent of lounge seating capacity being bariatric friendly. Furnishings in lobbies and waiting areas should also have the requisite size and right capacities needed for bariatric clients. In acquiring furniture for day and waiting areas, facilities are reminded to take into consideration the two main forms of severe obesity – the pear-shaped and the apple-shaped. Residents with pear-shaped bodies would usually not feel comfortable with chairs that have arms, whereas residents with apple-shaped bodies should be able to manage chairs with or without arms. Balancing different body shapes is remedied by having a mixture of both types of seating. In addition, seats should be at a height that make it easier for residents to stand without assistance.

Lift

Facilities 1 and 2 had two lifts each; both lifts were assessed in Facility 1 while only one lift was assessed in Facility 2. Facility 3 had no lift as all rooms were located on the ground floor. The team were unable to gain access to the main lift in Facility 2 which looked larger because it was closed for maintenance at the time of data collection. We assessed the immediate floor space that leads into the lift and the immediate space the lift opens into. Facility 1 had both the largest and smallest floor space that leads into the lift (5.4 and 3.6m^2 respectively). Lift 2 in Facility 1 recorded the largest space that a lift opens into while Facility 2 recorded the least space. Averagely, the floor space that goes into lift was slightly larger than the space the lift opens into (4.3m^2 vs 3.9m^2). Height and width of lift opening door space were similar in both facilities, except Facility 2 that had a narrower door width (0.9m). Facility 1 had the largest lift in terms of space (3.6m^2); about three times the size of the lift measured in Facility 2 (1.25m^2). See Appendix 3H: Facility Lift, for detailed measurements of lifts.

4.3.2 Equipment

International and New Zealand industry standards for bariatric equipment are based primarily on the safe working loads and specifications of the different types of equipment. The recommended considerations for bariatric equipment and storage are identified in Table 6.

Table 6 Standards for bariatric equipment and storage space

Type of equipment or space	Recommended consideration	Observed		
		Facility 1	**Facility 2**	**Facility 3**
Storage space for bariatric equipment	Facilities may consider creating larger spaces for bariatric equipment or deciding a priori to rent. Whenever possible and safe, equipment frequently used on client can be stored in a client's room, to facilitate access and regular usage[36].	Limited storage space available for bariatric equipment not in daily use. The storage of a bariatric bed would be problematic. The rooms were too small to store equipment; the bariatric wheelchair for a resident was stored at the end of the corridor outside of the resident's room.	Limited storage space for bariatric equipment not in daily use. The storage of a bariatric bed would be problematic. Equipment was stored in the resident's room with other non-essential items removed from the room to create more space.	Limited storage space for bariatric equipment not in daily use. The storage of a bariatric bed would be problematic. Equipment was stored in the resident's room. Although, none had a bariatric bed in use.
Friction reduction devices (FRDs)	Examples include sliding sheets, air-assisted devices, beds with turning features and ceiling lifters with repositioning slings. Using FRDs will require a great deal of exertion and expose the caregiver to increased spinal loads. To avoid this, up to 6 caregivers, which is one caregiver per 45kg would be needed[37].	Sliding sheets, ceiling hoists with repositioning slings (SWL 200kg), mobile sling hoist (SWL 227kg) and standing hoist (SWL 200kg) were available. Air assisted devices not available. Staff ratios for moving and handling were reported to range from 2-4 staff. No resident was reported to be over 200kg, in which case more than 4 staff would be required to provide safe care.	Sliding sheets, mobile sling hoists (SWL 227kg) and standing hoist (SWL 200kg) were available. Air assisted devices not available. Ceiling hoists were deliberately not installed, as the provider wanted to maintain a homely environment for residents. Staff ratios for moving and handling were reported to range from 2-4 staff. No resident was reported to be over 200kg, in which case more than 4 staff would be required to provide safe care.	Sliding sheets, ceiling hoists with repositioning slings (SWL 200kg), mobile sling hoist (SWL 227kg) and standing hoist (SWL 200kg) were available. Air assisted devices not available. Staff ratios for moving and handling were reported to range from 2-4 staff. No resident was reported to be over 200kg, in which case more than 4 staff would be required to provide safe care.
Bedframes and support surfaces	Bed width may range from 1.0m to 1.4m[56]. Preferably, facilities must procure bariatric beds with adjustable width. Additionally, the length of the bed is important, should be able to increase up to 3 meters[53].	Standards beds were 0.9m wide by 2m in length with a SWL 170kg. The standard mattress was 0.82m width by 1.9m length and had a weight capacity of 120kg Bariatric bed and mattress would need to be procured.	Standards beds were 0.9m wide by 2m in length with a SWL 170 kg. The standard mattress 0.82m width by 1.9m length had a weight capacity of 120kg. One bariatric bed and mattress was owned and in use.	Standards beds were 0.9m wide by 2m in length with a SWL 170kg. The standard mattress 0.82m width by 1.9m length had a weight capacity of 120kg. Bariatric bed and mattress would need to be procured.

All facilities had issues with storage space of the larger pieces of bariatric equipment when not in use:

> *And just the equipment and storage, and things like that. Because it – storage of that equipment when not in use, I mean even the size of the mattresses, oh gosh.* (Facility 1, interviewee 2)

Based on the standard equipment available in the facilities, most facilities could manage a resident weighing up to 120kg without requiring the additional purchase/procurement of equipment. The standard mattress (SWL 120kg) at all the facilities was the limiting factor for caring for residents with extreme obesity. All facilities had the ability to assist with the mobilisation of dependent (non-mobile) residents up to a weight of 227kg[vii], however, bariatric beds would need to be procured. The variety of equipment that was in use across the facilities is detailed in Appendix 4.

Where financially able the facilities attempted to cover the costs of the equipment:

> *We normally have wheelchairs and equipment available. However, some residents want to purchase their own.* (Facility 2, interviewee 2)

And when residents arrived for a short stay, they sometimes brought their own equipment in:

> *So, when most people come in with respite, they would bring their own equipment. They've already set up in their own homes, and normally well resourced. So, we say, "Well, if you need those items, you would best bring them with you." And that's what they do.* (Facility 2, interviewee 2)

Overall there was limited bariatric equipment owned by the facilities, and often, the more costly equipment such as a bariatric bed, was purchased by the resident. While some equipment was well used, other pieces were new:

> *We've got the odd bit of bariatric equipment that we can use, so shower commodes and things like that. So that just needs to be available for those people to use.* (Facility 1, interviewee 10)

> *We've actually just unpacked a large commode, right now.* (Facility 3, interviewee 1)

> *They wanted a particular special bed, which we didn't have, and they went out and purchased their own $8,000 bed…they purchased the linen as well*

[vii] Physical space and manoeuvrability of the heavy equipment (combined weight of equipment and resident) would still be problematic for staff.

> *for it. Because it was a different size. So, they went and did all that.* (Facility 1, interviewee 3)

Following a death, a family in Facility 3 bequeathed their gantry overhead hoist (SWL 200kg) to the facility for future resident use.

> *We also have one mobile overhead hoist as well. Which a family had bought for their mum, because she couldn't go into one of these rooms, and they have actually left that in the facility.* (Facility 3, interviewee 1)

If a resident had purchased a specialised piece of equipment, such as a bariatric wheelchair prior to admission to the ARC facility, it was not clear who was responsible for the maintenance or replacement of the equipment as this equipment did not form part of the ARRC agreement for contracted services as they relate to equipment requirements:

> *If you come in with something that expensive, it has a warranty attached to it. So now we're talking about it they've been here three or four years, and it's broken, then you would be going back to perhaps the family and saying well what are we going to do about it.* (Facility 1, interviewee 3)

> *And the family go, "oh the bed – the chair's broken." And I said, "Well it's not one of our chairs, but we can get it serviced for you, but you will need to pay the cost on that."* (Facility 2, interviewee 2)

Interviewees provided a wealth of information around standard equipment, bariatric equipment, purchase, lease or loan. The following quotes provide illustrations of positive experiences as well as the challenges with equipment used. Equipment that worked well mainly concerned hoists and some chairs.

> *Here we've got the ceiling hoists…. you just hook it on the person on the bed, you're done.* (Facility 2, interviewee 4)

> *I know our overhead hoist we've got four bedrooms that have got overhead hoists. And I am sure they take 150 kilos.* (Facility 3 , interviewee 1)

> *We cater for bigger shower chairs, which is great. And they tilt back, so it makes it easier and comfortable for the residents. And easy for them. So, they're sort of tilted back, and they're relaxed while you shower them.* (Facility 1, interviewee 7)

There was no one specific equipment need, rather interviewees spoke about wish lists and equipment they no longer had. Getting such equipment was sometimes easy, but on other occasions appeared opportunistic.

> *And the facility are quite accommodating when we say, "we actually need this," because they listen to your reasons.* (Facility 3, interviewee 1)

> *I'm hoping we can be a pilot site, and then if we can get some of this equipment added onto the head office, like, approved equipment list, then it would be easier to get that kind of thing for these kind of residents* (Facility 2, interviewee 10)

> *If I had a wish list. Well at the moment I'm desperate to try this maxi-air thing [hoover mat friction reducing device].* (Facility 2, interviewee 10)

> *We used to have a really big bath that used to be in that equipment room with all the stuff in it, and it used to even have a hoist that you could hoist them up into it. But they got rid of it, for whatever reason.* (Facility 3, interviewee 2)

Challenges with equipment impacted resident care in two ways. Firstly, the equipment had to be shared, and secondly, a lack of equipment meant some potential new residents were declined a place at a facility.

> *We have allocations for instance you'll have -- there's an allocation that says that there's like, say, eight residents in the morning. And in that eight residents you might have four slings.* (Facility 1, interviewee 7)

Several instances were described by interviewees where a potential resident had to remain in an acute hospital because a suitable facility as the appropriate equipment could not be found:

> *Obviously when you don't have equipment, you can decline entry, just say no. We don't have resources. So, we can decline entry a person requiring a bed, with the ones where we don't have a bed, when we don't have equipment, or staffing issues.* (Facility 1, interviewee 2)

4.4.2 Finance

The ARRC contracted care services payments are based on four care categories (Rest home, hospital, dementia and psychogeriatric care) and are purchased as a single bed-day. This single bed-day purchase price is expected to cover four components of care funding (accommodation; everyday services; core care and support; additional care and support). In addition to the contracted services payment ARC facilities have access to some specific supplementary funding streams for assistance in managing costs associated with certain care needs, with bariatric care identified as one of these funding streams[5].

ARC facilities have some flexibility in determining staff to resident ratios based on the two national service agreements that provide recommendations for safe staffing. For hospital

level (continuing) care each resident is allocated 2.4 hours of caregiver and one hour of registered nurse time (can be up to 2 hours for high acuity)[9]. All staffing costs, however, must be managed under the constraints of the single-bed day payments. Staffing ratios across each facility are listed in the Table 7.

Table 7 Staff to resident ratios at each Facility

Staffing ratios	Facility 1	Facility 2	Facility 3
Hospital level RN to resident ratio	Morning: 1:20 Afternoon: 1:20 Night: 1:47	Morning: 1:20 Afternoon: 1:20 Night: 1:58	Morning: 1:28 Afternoon: 1:28 Night: 1:57
Hospital level HCA to resident ratio	Morning: 1:4 Afternoon: 1:6 Night ratio: 1:47	Morning: 1:5 Afternoon: 1:7 Night: 1:20	Morning: 1:7 Afternoon: 1:9 Night: 1:28

Interviewees in each of the facilities discussed staffing ratios as one of the decision-making considerations in caring for older adults with extreme obesity. Some interviewees shared that the staffing ratio would be considered in advance and others retrospectively on arrival:

> *And then we'd be looking at the staffing, and how we might need to look at the roster in terms of having the staffing on board for the time that the person would require the cares, and you know at the certain times of the day, to make sure we had enough people on board. Cause we wouldn't necessarily need to carry that number of staff across a whole shift.* (Facility 3, interviewee 7)

Staffing ratios may be stretched, irrespective of care needs:

> *In the hospital, you get two nurses in the morning, and then one in the afternoon and one at night. But that's for 40, 43 residents.* (Facility 1, interviewee 1)

> *If the person is really really heavy, I would love to have two.* (Facility 2, interviewee 5)

> *Because they [obese people] can be very time-consuming - and as you know, it's like everything, is like fast space- and as much as you want to give the time to each and every resident, you can't.* (Facility 1, interviewee 4)

Additional staffing needs were identified to address the care needs of older people with extreme obesity:

> *You really need that teamwork to discuss, and saying, 'Hey, we need, you know, three or four people here to help and we're doing the cares.' If we're going to do it properly…. Respect, you just need more humans* (Facility 3, interviewee 3)

Staffing needs also involved the physical attributes of staff for one facility:

> *If I got smaller staff - like, smaller stage of people [referring to staff of small stature], I have to shift them up and - like, and put the males, because they say isn't that good, I have to take a male from that group, and I got to be in there so that and I give them three staff. I got two males to do cares.* (Facility 3, interviewee 5)

Resident contributions and DHB contracted subsidies

The maximum resident weekly contribution (inclusive of GST) for contracted care services provided to them in the region in which their rest home or continuing care hospital was located ranged from $1,033.55 to $1,124.41[57]. The maximum contribution is the same for all residents regardless of the type of care services the person receives. It is equivalent to the rest home contract price applying to residential care facilities in each territorial local authority region[57]. All three facilities reported charging residents a maximum of $156.60 per day for contracted care services. The three facilities received the following maximum funding from the DHB for daily contracted services per bed-day: Rest home care: $156.60; Hospital level care $245.30; and Dementia care $209.75 (only one facility offered dementia care). Residents make the $156.60 contribution in accordance with the assessment of their financial assets[58].

Supplementary funding sources

There are supplementary funding streams for assistance in managing costs associated with certain care needs which are considered in addition to the requirements set out in the ARRC agreement. Whilst there is provision for extra financial support to care for bariatric residents, bariatric equipment, a significant financial cost to procure, is currently considered standard equipment under the ARRC agreement[9]. 'Standard' equipment refers to equipment that all residents are entitled to as part of their contracted care services. Therefore, beds, chairs, and commodes are standard. The implications for older adults with extreme obesity is that standard sized equipment (owned by providers) does not fit this population and is not seen as 'customised' when using the definitions of what residents are entitled to. Older adults with extreme obesity need 'customised' standard equipment. The daily bed rates do not fully cover the cost of ARC facilities providing this essential equipment. This inequitable funding approach has a significant impact on the individual residents, families, ARC facility and the District Health Board. Interviewees in the study noted that families bring in or purchased equipment:

> *Sometimes the families, when they're bringing in someone that is obese, sometimes they come with the equipment.* (Facility 1, interviewee 7)

Or the facility made do with the existing equipment knowing that it was not fit for purpose:

Equipment's an issue, and in this lady's case we were able to – she already had very large chair, so she already sleeps in her chair all – all night. So, she doesn't sleep in a bed, so the bed would never ever be wide enough for her, the bed we have at the moment. (Facility 1, interviewee 6)

Provision for high acuity patient needs are considered on a case-by-case basis between the DHB funder and ARC facility:

People that are here for long-term care, that are through the system, the most a person has to pay is $156.65 personally. The top-up to dementia and hospital, where -- of the $53 and $88, is always paid by the DHB. So, we have a funding schedule that every fortnight we update, and we get funded. The $156.65, that can be funded anywhere between 0 and $156.65 by the person, or that can be funded, and that drops back to personal circumstances. (Facility 1, interviewee 3)

So, if the DHB have a respite person, they will ring us and say we've got respite. So, we will say are the family prepared to pay for the premium? DHB pay the daily rate, family pay the $33. Sometimes the family will say no, and if we have an empty bed for two weeks, we might take them anyway and not charge. We have that discretion or option…And so on a daily basis we're going "Are you rest home? Are you dementia? Are you hospital?" Are you prepared to pay premium? Are you long term? Are you short term? Yeah. It's a juggling game. It is. (Facility 1, interviewee 3)

Premium room service charges

ARC facilities may charge residents additional costs for 'premium' rooms which are defined as having 'additional features of a permanent or fixed nature'[8]. This is different to a resident having additional room services, such receiving a daily newspaper, or having pay-for-view TV or a personal phone line. Charges applied to the resident for 'premium' rooms are negotiated between the facility and the resident and must be specified in the admission agreement and contract. There is no public funding available for residents for premium room fees or additional services[8].

Each facility had different criteria in place for the additional charges applied to residents for premium and personal (non-care) services which are not covered in the ARRC services agreement. Facilities 1 and 2 charged varying premium room charges and these were related to the size of the room, the vista/outlook from the windows and the relative newness of the chattels. The premium charges for Facilities 1 and 2 ranged from $30-49 per day. Additional room service fees varied considerably between facilities for the different services offered to residents and the range of services offered varied. Facility 2 had no standard rooms available for residents as all rooms were described as being above the Ministry of Health standard requirements.

> *Technically each and every one of our rooms, legally, is a premium room. Because you're not obliged to give an ensuite with aged care. So, the aged care have criteria about what is an aged care room, and it doesn't include an ensuite. So technically we could choose to charge a premium on each and every room that we have. But we don't.* (Facility 1, interviewee 3)

Differential costings apply to Facility 2, although these may not be associated directly with size of room or grade of facilities within the room, whereas Facility 1 interviewees described newer, larger rooms:

> *Then add on a room premium. And ours are based on an 'A' through 'H' classification, and that primarily is driven by the outlook of the room. Nothing to do with the size of the room, or anything else. It's primarily due to the view they have out their window. Or if it's an outside view versus an inside view.* (Facility 2, interviewee 2)

> *So, our [Facility name], which is newer with bigger rooms, we have a $33.87 a day Extra charge on top of that. But primarily, as I said, it's for the room.* (Facility 2, interviewee 3)

Facility 3 never charged for any premium room rates. Facility 1 had only premium rooms that was appropriate for managing an older adult with extreme obesity due to the larger sized room and ensuite, double doorway and the installation of ceiling hoists. If a premium room was available and not requested by the resident/family, Facility 1 did not charge the premium rate. Although, as soon as a standard room became available the resident would be offered the choice to remain in the premium room at the premium cost of room or be transferred to the available standard room. Premium charges may be applied to older adults with extreme obesity purely on the basis of the facility charging processes but any decision to apply these charges in Facility 1 was made on a case-by-case basis.

> [*Building B] would be best for them [resident with extreme obesity] …Yeah, it would still -- as far as we would be concerned, it is a premium room. We're not obliged because there are no conditions for larger people, there are no exceptions. So, we have the discretion to say, 'Look, we understand you can't pay, we won't charge.' We do have that discretion…. Financially we clearly try our best not to do that [charge]. And our answer is, if you need to come in and you can't pay the premium, and that's our only room, then you need to look elsewhere. And only if there is no bed in a certain radius, and we are under a certain occupancy that there's a formula for what we can do.* (Facility 1, interviewee 3)

Interviewees from Facilities 1 and 2 discussed how additional costings would be raised, at what point and why. Discretional decisions around charging were also possible and may change over time:

So, if the DHB have a respite person, they will ring us and say we've got respite. So, we will say are the family prepared to pay for the premium? DHB pay the daily rate, family pay the $33. Sometimes the family will say no, and if we have an empty bed for two weeks, we might take them anyway and not charge. We have that discretion or option. (Facility 1, interviewee 3)

There are slight restrictions about when we can and cannot charge a premium room. So, if we have the only bed left available in Wellington, and there is not one other aged care facility with one bed, we – and someone can't afford to pay the premium, we're not allowed to charge. (Facility 1, interviewee 3)

You ask them when they come, or when they look in the first place. 'Are you looking for a premium room?' I now will have conversations with people, sometimes if I'm showing them around, and explain exactly how it works -- - So sometimes you'll find people say that's fine, the family have agreed to pay it. Somebody came in recently to our dementia ward, so slightly different, but that EPOA said look, that's fine, he has enough money to pay for that premium for the next, you know, three to five years, at which point maybe we have a conversation in five years and say, 'Look, we understand you can't pay any longer, we'll play our discretion card.' (Facility 1, interviewee 3)

You'd talk about the room classification, and they could, if able, choose a room. If not, it would be the available room. And then in that case if they wanted to go to a cheaper room, they could waitlist for the next available one, and that's what we often do. (Facility 2, interviewee 2)

So, our dementia wing is now premium, it never used to be. But we do run a - we budget that for 50/50. Like 50% non - because we run a much bigger discretion card there. And any of our existing residents, at no point do we go and try to bump them up to a premium. (Facility 1, interviewee 3)

The financial risk for the provider acted as a barrier for ARC facilities to accept older adult with extreme obesity into their facility; with equipment procurement and safe staffing ratios as key barriers. Residents and family were expected to contribute to care needs as a result of the resident's larger size and the financial implications for continued care.

4.4.3 Education

McCabe et al.[59] argue that education in aged care needs to move away from a focus on task to a prioritisation of resident's choice and control. It has been recommended that the focus of education in the sector needs to be on person-centred care. Sjögren, Lindkvist, Sandman, Zingmark and Edvardsson[60] found that units with higher levels of

person-centred care correlated with a higher proportion of staff engaged in continuing education, and staff supervision.

The New Zealand Qualifications Framework outline a range of qualifications suitable for those working in the health care sector[61]. Up until December 2018 the National Certificate in Health, Disability and Aged Support (Level 3) and the National Certificate in Health, Disability, and Aged Support (Senior Support) (Level 4) were available. These qualifications were reviewed in 2018 and discontinued. The qualifications were recently replaced with the New Zealand Certificate in Health and Wellbeing and while the term 'aged support' has disappeared from the course description, this qualification includes elements of health assistance. A graduate Diploma in Health (Aged Care) (Level 7) is available, although this was due for review in 2017 and no updates are shown on the qualifications website at the time of preparing this report. Courses are available at a number of institutions, for example, the Open Polytechnic offer course 77328 Working with Older People (Level 7)[62]. Local training is available and some but not all District Health Boards provide safe moving and handling training.

An interviewee from Facility 1 suggested that education and training was person specific, this was not echoed by any other interviewee in the study:

> *Well, you can always get more -- training, more education. You know, according to the needs of the person.* (Facility 1, interviewee 4)

In all three facilities interviewees reported participating in what they considered standard education and training, primarily this related to manual handling:

> *Education-wise, it's the manual handling that we have. It's like a regular manual handling updating and I went recently, last week, I think.* (Facility 2, interviewee 8)

In all instances training and education was delivered by the facility itself, as part of a standardised educational package. Many Health Care Assistants reported having completed their level three or level four New Zealand Qualification Authority (NZQA) qualification:

> *At the moment I'm doing my Level 3 healthcare assistant. I have my Level 2 healthcare assistant. And apart from just caring for the [residents]… the model that they give us, I actually don't really recall anything special about larger people, yeah, to be honest.* (Facility 3, interviewee 8)

For registered nurses there is an expectation from the Nursing Council of New Zealand that each nurse will continue to learn and maintain their competence. There is an expectation that nurses complete 60 hours of professional development in three years and that this professional learning includes more than mandatory core training required by employers and must relate to the nurses area of practice[63]. Across all facilities

interviewees reported participating in what they considered standard education and training, primarily this related to safe moving and handling which was an annual event in all facilities.

Interviewees indicated a variety of training was provided in relation to equipment, safe handling and health care approaches. Many also identified gaps in training, including training specific to people with extreme obesity that left staff feeling unsure of how to best care.

> *Maybe if -- because I'm not trained in it [bariatric care], you know? I'm not aware of it. That's probably why. I don't know-- I'm overwhelmed, you know? I'm not sure how to care for these people.* (Facility 3, interviewee 4)

Training that should be provided should be tailored and evidenced based. Interviewees were particularly interested in gaining skills and tools in how to effectively and safely handle, turn and mobilise residents with extreme obesity and to maintain the integrity of their skin.

> *One [area] would be safe transfer. And equipment that is out there that we could use. But it would also be on maybe a bit of research…what people have found actually works for these people that makes them comfortable that doesn't make their joints sore, what are good pressure relieving ideas, what skin conditions they get. I think skin would be the big one. And being aware of how quickly your skin can deteriorate. Your signs and symptoms, what to look for, when to be aware.* (Facility 3, interviewee 1)

4.4.4 Decision-making

The decision-making process to accept an older adult with extreme obesity into an ARC facility was complex and multifaceted with a primary focus on the assessment of risk for the potential resident, staff and ARC facility. When making decisions, decision makers considered the person's individual needs with regard to the general care needs and acuity of other resident's currently living at the facility.

Decisions focused around the assessment process at the time of referral, the care burden of the resident, occupancy of the facility and nearby facilities, the continued care needs and predicted increase in needs of the resident, funding limitations, and physical and human resources.

Interviewees shared that sometimes they were involved in decisions to accept a resident with extreme obesity into a facility, but on other occasions they were just informed of the decision, as the responsibility for residents' concerned management. Not being involved in decisions was considered by some to be a feature of the interviewee's role in the facility. When they were involved in decisions, discussions pertained to rooms, equipment and resident acuity. An aspect of accepting a resident involved meeting the person:

Decision-making process if we had a[n] appropriate room, and appropriate equipment and that I would be thinking about the acuity of our current residents. So, there's a lot that goes into decision-making. (Facility 3, interviewee 7)

Have to see the person. [If] She's 200 kilos, so she will be like only 60 kilos more of our obese resident. So how tall is she? If she's very tall…I have to -- I need to eyeball her and assess her physically, her cognitions and everything. Because a referral is a referral, and is also nice - it is also good to entertain those enquiries as a clientele, especially the social workers, the relationship we have that with them we cannot just say no. And then I need to assess if we have the equipment. Mostly -- most likely with a 200kg [person], she might be like 6 foot 7, or 6 foot 5, we don't have that long bed. She might -- can turn around, that is okay, but with her body mass index, perhaps it's not too good. And I will just tell her that I'm sorry, but we don't have that -- we currently don't have those equipment. Perhaps I will talk to your social worker how we can accommodate you. (Facility 3, interviewee 6)

Once a decision is made about accepting a new resident, plans are then put in place to prepare for and accommodate the person. Planning involved not only conversations internally within a facility, but also with social work and hospital staff:

So, the clinical manager who will oversee the process of admission, making sure that we have the right bed, the right stuff, the right…staff, caregivers, people, who look after the patient. (Facility 1, interviewee 9)

I would ask like, 'oh, is this person coming in for permanent or respite care?' If it's permanent, I [would say]…before you actually transition this person, can we make sure that things are actually put in place, like what are her mobility needs, what are any…things that we need to put in place?...So I really want to be[prepared] –I know sometimes it sounds like a OCD, but you just don't know what you're going to receive, you know, what comes in from the door…So that becomes quite tricky. Sometimes I can get a good handover from the social worker…Or somebody from care coordination. Other times not really, no [handover]. (Facility 2, interviewee 7)

Staff highlighted that the referral process was fraught with issues particularly around the sharing of information between the DHB and ARC facility about the specific care needs of the potential resident. Interviewees spoke about being called a number of times to accept a resident and then "*they* [referring to the DHB] *were not quite truthful about everything"* (Facility 1, interviewee 2). They also spoke about the need for clear and accurate handover, and how that has not always been the case.

> *I think it's about being honest. I think that we need to be honest with each other, and we're trying to do that and say, look -- I went down to see someone last week, but far too complex for us at the moment. And I've had to say, look it's just -- at the moment we won't be able to do this successfully, and it wouldn't be fair on him or his family, or my staff, because they've got too many complex people at the moment. So yeah, and then -- but then we have taken other people as well. That are complex, and you know, and looked after them.* (Facility 1, interviewee 6)

The weight of the resident was often not disclosed unless specifically asked for.

> *Sometimes they are a little bit economical with some details in regard to particular issues. So, I have to be rather tactful and explore those [weight/size] …. We have been caught out twice. In terms of little surprises that come through the door on a bariatric-size stretcher. And learnt the hard way around making sure that you do that clinical due diligence, and just ask those questions, and make sure that you're satisfied with what you're hearing. Often discharge summaries from the hospital lack detail. The key ones where they lack the detail are often about size, and community-acquired infections.* (Facility 1, interviewee 2)

After a person is admitted to a facility, there are a number of considerations taken into account particularly in relation to safety of the resident and of the healthcare workers. Each facility had a number of policies related to moving and handling and emergency management. However, these policies did not reflect the specific needs of extremely obese residents. Study interviewees were asked to think how they would manage an extremely obese resident in specific situations such as a fall, a fire, an earthquake etc. Many interviewees had a different approach on how they would manage in a given situation; there was no shared approach amongst the healthcare team. The resident's weight was a key factor in the decision-making around evacuation, emergency management and falls. One interviewee commented that in the event of a fire the resident would have to stay behind:

> *I don't know whether I should be saying this, but they cannot be taken out from the room--the bed can't fit through the door [and the resident is immobile].* (Facility 2, interviewee 8)

Another interviewee stated:

> *Oh, that would be the last person…Definitely, because we have to consider the others. And this [a fire] demands a lot of staff to lift that person. So definitely if there's a fire, that person is the last person.* (Facility 3, interviewee 5)

Other interviewees talked about the need to avail emergency services (fire, ambulance) if a resident could not be moved or evacuated. Others still had a very pragmatic approach

in using whatever means necessary to keep a resident safe while attending to their individual needs:

> *Unfortunately, there's no way we could get her out. If she wanted to go up in the hoist, and then get her in a lazyboy and get her out, we could physically do it…but I think she would have so much panic and anxiety around it, I don't think she'd let us.* (Facility 2, Interviewee 10)

> *If for instance it's a fire, and they are away from the fire, you don't have that time to get the hoist, or -- so you would try and get the slippery Sam, or sheet, and you'd be like two or three of you, and you'd use the sheet to pull along.* (Facility 1, interviewee 7)

5. DISCUSSION AND RECOMMENDATIONS

The key findings of this research identified that whilst healthcare staff are willing to care for older adults with extreme obesity, the ARC facilities were not well equipped or ready to provide safe equitable care for this resident population. Key areas of concern for ARC facilities related to limitations in the infrastructure of current facilities, and financial barriers for ARRC contracted services which incorporated equipment and safe staffing ratios. The *Healthy Ageing Strategy* is premised on healthy independence, connection and respect for older people[64]. Therefore, it is necessary that the development of services to address the areas of concern within this report are person-centered, geographically accessible and equitable for all. It is important therefore that information about which facilities can accommodate older adults with extreme obesity is available for potential residents, families/whānau, aged care providers and District Health Boards.

The challenges and barriers to providing safe equitable care are partly an issue because of outdated financial models and infrastructure that were developed prior to the need for bariatric specific care services. ARC facilities in this study were not purpose built and have been remodelled and retrofitted for aged residential care. Although the adaptations to the facilities meet the care of most residents, none have areas specifically designed to meet the needs of older adults with extreme obesity. This is not surprising given that infrastructure specification standards are relatively new for the care of bariatric people in the New Zealand. However, the New Zealand population is ageing, and obesity rates are increasing. As the peak obesity rate in New Zealand is in the 65-74 age group[10] it is not unsurprising that the proportion of adults living with extreme obesity has increased in the 10 years since 2006[13]. Our findings identify that 31.6% of residents in ARC facilities are overweight, obese or extremely obese (1.7%). While the facilities can typically manage those residents, who are overweight or obese, they are not set up to effectively care for those with extreme obesity.

The aged care sector and the Ministry of Health need to prioritise addressing this issue and find ways to accommodate older adults who are extremely obese in ARC facilities. Achieving this will require addressing infrastructure as the current infrastructure does not meet international and Australasian recommendations for safe working conditions and resident comfort. New Zealand specific specifications are urgently required to ensure that bariatric spaces are appropriately designed to meet resident care needs and that these standards are factored into architectural plans for all new ARC buildings. The cost of retrofitting/remodelling ARC facilities is prohibitive given the current funding model and acts as a barrier for providers to make these building modifications. One study in India noted the estimated costs of retrofitting existing buildings for bariatric residents is US$ 39,139 per bed/room [50]. The government may have to consider making available targeted funding to enable some facilities in all District Health Boards have some suitable rooms and resources for people with extreme obesity.

Recommendations 1-6

The Ministry of Health needs to urgently develop comprehensive New Zealand standards and infrastructure specifications for bariatric care within acute and community settings.

The Ministry of Health needs to urgently review the national and regional capacity of ARC facilities to care for older adults with extreme obesity to identify who can accommodate this resident population, what physical and human resources (equipment and staffing) are needed and develop a plan for addressing the service gaps.

The Ministry of Health needs to develop a strategy for implementing bariatric specific infrastructure standards for all planned new and remodelling building work.

The Ministry of Health needs to review financial support for ARC facilities to upgrade existing buildings to meet bariatric specifications as part of a national and regional obesity strategy to meet bariatric standards in different regions.

ARC facilities need to review their infrastructure against the current standards outlined in this report. Consideration should be given to how facilities will go about meeting the standards in existing buildings and planned new building work.

ARC facilities need to review their existing and planned infrastructure in relation to the needs of bariatric populations to identify how services gaps can be addressed.

The current funding model developed in the 1990s was based on the resident clinical profile of that time. This average pricing approach of the 1990s makes it difficult for providers to manage the higher care costs associated with bariatric residents. Equally, the supplementary funding streams in the existing funding model are not fit for purpose. Whilst there is provision for extra financial support to care for bariatric residents, bariatric equipment, a significant financial cost to procure, is currently considered standard equipment under the ARRC agreement. The implications for older adults with extreme obesity is that standard sized equipment (owned by providers) does not fit this population and is not seen as 'customised' when using the definitions of what residents are entitled too. For older adults with extreme obesity they need 'customised' standard equipment. Given the high cost of bariatric equipment (Bed NZ$14,700, Pressure relieving mattress NZ$5,700, wheelchair NZ$6,750 commode NZ$5,170)[viii] it is important that such care items are not considered 'standard' equipment that a resident is entitled to under the ARRC agreement. At present families and individual residents often bear the financial burden of purchasing essential care equipment (such as a bed or a chair). As such, the current funding approach has a significant impact on the individual residents, families, ARC facility and the District Health Board.

[viii] Prices quotes by NZ industry provider of bariatric equipment, September 2019

Recommendation 7

The Ministry of Health needs to urgently review ARRC service agreement funding arrangements (funding model) in order to ensure safe equitable care for older adults with extreme obesity. This agreement should include funding for the additional financial costs associated with bariatric equipment which is essential.

Current staffing ratios for residents who require hospital level (continuing) care across the 24-hour period are not sufficient for older adults with extreme obesity (2 hours of Registered Nurse time per day per resident with high acuity needs and 2.4 hours of Health Care Assistant support). When assessing care needs current practice standards recommend one caregiver per 45kg of patient weight when using safe moving and handling equipment (friction reduction devices i.e. sliding sheets)[37]. When applying the standards to future patient profiles of approximately 150kg who require moving and handling assistance, it is expected that staffing ratios need to be higher. For example, if a resident with a weight of 150kg is bed bound and requires repositioning 6 times a day the human resources required are conservatively estimated to be in excess of 6 hours (3 staff at 20 mins a time). These staffing hours exclude any additional clinical and individual care needs. International studies have found that as older people's BMI increases carers need more time than when they perform the same task with non-obese residents These studies consistently showed the need for extra time allocation to assist in care needs[65–67].

Recommendation 8

The aged care sector in partnership with the Ministry of Health needs to review the human resources that are required to safely care for older adults with extreme obesity.

There is a clear lack of specific education on extreme obesity in the aged care sector. The findings from this research demonstrate that tailored education specifically focused on obesity in older adults is highly sought after from healthcare workers in the aged care sector. This education should address the gaps in current knowledge which were identified to be clinical assessment, nutrition, mobilisation, mental health and wellbeing as well as emergency management procedures. Education and training specific to bariatric care needs should be undertaken prospectively and not on or after arrival of a patient with bariatric care needs. Given the financial constraints of aged residential care facilities the model of education delivery needs to be interdisciplinary, flexible, creative and cost-effective.

Recommendation 9

The aged care sector in partnership with education providers and obesity experts need to establish tailored education packages to meet the needs of the sector and older adults with extreme obesity.

The decision-making process to accept an older adult with extreme obesity into an ARC facility is complex, multifaceted and fraught with difficulty. There is an emphasis on the assessment of risk for the potential resident, staff and the facility. Identified issues related to interprofessional communication and collaboration between District Health Board and ARC provider teams. There was a lack of clarity and transparency around the status of a potential resident and their specific care needs. The weight of the resident was often not disclosed unless specifically asked for. These issues impacted on the transition from acute hospital services to ARC facilities where often the facility was under resourced to care for older adults with extreme obesity. In some circumstances, individuals had to wait considerable time in the acute setting before a bed became available to them. These challenges have been well documented in studies investigating the transition of care of older adults from hospital to community settings[68]. Notably delays are related to the structure of the healthcare systems, scarcity of beds, lack of communication between healthcare teams and insufficient patient and family/whānau involvement[68,69]. The impact of the delays can result in an increased risk of infection and impact on individuals feelings of health and wellness as well as an increase the financial costs and the overall performance of the healthcare system[70]. Additionally, decision-making regarding resident safety relied on existing health and safety policies. These policies lacked specific weight-based risk assessment to guide care in the event of patient and facility emergency management (for example falls, fire, earthquake).

Recommendations 10-11

District Health Boards need to review hospital transition processes to ensure clear communication and decision-making pathways are in place to support timely transition of older adults with extreme obesity into an ARC facility.

ARC facilities need to review and develop emergency management procedures that take into consideration the weight and size of their residents.

This research has identified some of the barriers and enablers in caring for older adults with extreme obesity in aged residential care facilities. A larger study is required on this topic to better understand the issues nationally. In addition, research is required on the experiences and health outcomes of those with extreme obesity in the residential care facilities. Given that many people with extreme obesity never go into a residential care facility, research is required to understand the care needs of older adults with obesity and extreme obesity who continue to live in the community and the needs of their caregivers (both whānau and professional carers). Specifically, it is important to understand both Māori and Pacific Peoples' experiences and perspectives in caring for older adults with extreme obesity as these groups typically reside in the community. We recommend that further research is needed to understand the different clinical profiles of older adults with extreme obesity in order to inform resource provisions.

6. STUDY STRENGTHS AND LIMITATIONS

The key strengths of this research is the research was undertaken in three facilities with different business models and different philosophies. Secondly, by using a mixed method approach to data gathering data on the actual dimensions and equipment available as well as ARC staff perspectives on the resources to care for those with extreme obesity were able to be obtained. The combined findings provide a rich picture of the issues of delivering care for people with extreme obesity in ARC facilities. Whilst every effort was taken to ensure findings were derived independent of researcher bias and triangulated from different data obtained about/from each facility and across facilities there are limitations to this research. Firstly, although the research only focused on three facilities, it is possible the facilities are 'outliers' compared to facilities of similar locations, characteristics or business models. All three facilities were in urban North Island of New Zealand. It is likely facilities in South Island and/or rural facilities would provide some different context and experiences, although demographically the facilities included were typical of most facilities in New Zealand.

InterRAI provides a large quantitative data source for national and facility level data. A key limitation of this study is that the Central Region's Technical Advisory Services Limited (TAS) in New Zealand gives no warranty that the information supplied in the InterRAI system is free from error. Routine data collection and processing may contain errors, including data linkage problems and underreporting, which could reduce the validity of the data. Differences in management practices within and across the ARC facilities could also reflect differences in reporting demographic and disease classifications. In the data we had access to, we observed some outliers that may relate to data entry errors (e.g. input of height and weight). However, studies from other countries utilising InterRAI datasets report consistent and stable trends in internal consistency (e.g., Hogeveen, Chen & Hirdes, 2017)[71].

While every effort was taken to ensure the accuracy of facility measurements by using two researchers for all measurements, it is possible operator error could have meant incorrect measurement data. Ethnicity data for facility staff was poorly recorded across all three facilities making it difficult to gather and profile. However, while lacking in actual numbers it was possible for the research team to gather a picture of the overall ethnicity of the staff.

7. CONCLUSION

Aged residential care facilities are not prepared to accommodate the existing and increasing number of New Zealanders who will require bariatric specific care. A significant government investment is needed to address the safety, equity and care concerns of older adults with extreme obesity. This investment needs to address infrastructure, funding and workforce development. The healthcare workforce in this report demonstrated a high degree of care and compassion despite the lack of resources and education available to them in caring for this resident population. Whilst only three ARC facilities were explored, the issues highlighted in regard to safety and equity are significant enough to warrant careful examination at a national level. There are implications of not addressing the concerns outlined in this research and these include: an increasing financial burden on the aged care sector; longer length of acute hospital stays; financial repercussions on older adults and their families/whānau; unsustainability of the aged care workforce and; further stigmatisation of people with obesity.

8. REFERENCES

1. Minister of Health. New Zealand Health Strategy: Future direction. (2016).
2. Minister of Health. New Zealand Health Strategy: Roadmap of actions 2016. (2016).
3. Marcellini, F. *et al.* Obesity and body mass index (BMI) in relation to lifestyle and psychosocial aspects. *Arch. Gerontol. Geriatr.* **49**, 195–206 (2009).
4. Amarya, S., Singh, K. & Sabharwal, M. Health consequences of obesity in the elderly. *J. Clin. Gerontol. Geriatr.* **5**, 63–67 (2014).
5. Ernst Young. Aged Residential Care Funding Model Review. (2019).
6. New Zealand Government. About residential care. *New Zealand Government* https://www.govt.nz/browse/health/residential-care/about-residential-care/ (2019).
7. New Zealand Aged Care Association. *Caring for our older kiwis. The right place, at the right time*. https://nzaca.org.nz/policy/caring-for-our-older-kiwis/full-report/ (2018).
8. Technical Advisory Services. Aged Residential Care (ARC) - TAS Harnessing smart thinking on health for New Zealand. https://tas.health.nz/dhb-programmes-and-contracts/health-of-older-people-programme/aged-residential-care/#National (2019).
9. Technical Advisory Services. Aged Related Residential Care Services Agreement 2019: For the provision of Aged-Related Residential Care. (2019).
10. Ministry of Health. Annual Data Explorer 2016/17: New Zealand Health Survey. https://minhealthnz.shinyapps.io/nz-health-survey-2016-17-annual-data-explorer/_w_468cf4a0/_w_47fa6472/_w_830ee5c9/#!/home (2017).
11. NCD Risk Factor Collaboration. Trends in adult body-mass index in 200 countries from 1975 to 2014: A pooled analysis of 1698 population-based measurement studies with 19.2 million participants. *Lancet* **387**, 1377–1396 (2016).
12. Ministry of Health. Annual Update of Key Results 2016/17: New Zealand Health Survey. *Ministry of Health NZ* https://www.health.govt.nz/publication/annual-update-key-results-2016-17-new-zealand-health-survey (2017).
13. Ministry of Health. Annual update of key results 2017/18: New Zealand health survey. *Ministry of Health NZ* https://www.health.govt.nz/publication/annual-update-key-results-2017-18-new-zealand-health-survey (2019).
14. Ministry of Health. Understanding excess body weight: New Zealand health survey. (2015).
15. National Heart, Lung, and Blood Institute. Classification of overweight and obesity by BMI, waist circumference, and associated disease risks. https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi_dis.htm.
16. Stenholm, S., Sainio, P., Rantanen, T., Alanen, E. & Koskinen, S. Effect of co-morbidity on the association of high body mass index with walking limitation among men and women aged 55 years and older. *Aging Clin. Exp. Res.* **19**, 277–283 (2007).
17. Vincent, H. K., Vincent, K. R. & Lamb, K. M. Obesity and mobility disability in the older adult. *Obes. Rev. Off. J. Int. Assoc. Study Obes.* **11**, 568–579 (2010).
18. Bohannon, R. W. Body mass index and mobility of older home care patients. *Physiother. Theory Pract.* **27**, 460–462 (2011).

19. Polyzos, S. A. & Margioris, A. N. Sarcopenic obesity. *Hormones* **17**, 321–331 (2018).
20. Baumgartner, R. N. *et al.* Sarcopenic obesity predicts instrumental activities of daily living disability in the elderly. *Obes. Res.* **12**, 1995–2004 (2004).
21. Cho, Y., Shin, S. Y. & Shin, M. J. Sarcopenic obesity is associated with lower indicators of psychological health and quality of life in Koreans. *Nutr. Res.* **35**, 384–392 (2015).
22. Tian, S. & Xu, Y. Association of sarcopenic obesity with the risk of all-cause mortality: A meta-analysis of prospective cohort studies. *Geriatr. Gerontol. Int.* **16**, 155–166 (2016).
23. Camden-Gallagher, S. Nursing care of the bariatric patient. *Bariatr. Nurs. Surg. Patient Care* **1**, 21–30 (2006).
24. Accident Corporation Company. *Moving and Handling People: The New Zealand Guidelines.* (2011).
25. Westerly, B. D. & Dabbagh, O. Morbidity and mortality characteristics of morbidly obese patients admitted to hospital and intensive care units. *J. Crit. Care* **26**, 180–185 (2011).
26. Winkelman, C. & Maloney, B. Obese ICU patients: Resource utilization and outcomes. *Clin. Nurs. Res.* **14**, 303–323 (2005).
27. Hales, C. Misfits: An ethnographic study of extremely fat patients in intensive care. (Victoria University, Wellington, 2015).
28. Hales, C., deVries, K. & Coombs, M. The challenges in caring for morbidly obese patients in Intensive Care: A focused ethnographic study. *Aust. Crit. Care* **31**, 37–41 (2018).
29. Hales, C., Curran, N. & deVries, K. Morbidly obese patients' experiences of mobility during hospitalisation and rehabilitation: A qualitative descriptive study. *Nurs. Prax. N. Z.* **3**, 20–31 (2018).
30. Hales, C. & Bishop, I. Developing care services for large patients: A partnership model of service delivery. Bariatric Management Innovations Research Seminar Series. in *Research Seminar* (2016).
31. Stake, R. E. *The art of case study research*. (SAGE Publications Ltd, 1995).
32. Stake, R. E. *Multiple case study analysis*. (The Guilford Press, 2006).
33. Creswell, J. *Research design: Qualitative, quantitative, and mixed methods approaches*. (SAGE, 2018).
34. Hastings, S. L. & Salkind, N. Triangulation. Encyclopedia of research design. (2010).
35. Worksafe Victoria. *A guide to designing workplaces for safer handling of people: For health, aged care, rehabilitation and disability facilities.* (2007).
36. Veterans Health Administration Center for Engineering & Occuational Safety and Health. *Bariatric safe patient handling and mobility guidebook: A resource guide for care of persons of size*. (2015).
37. ArjoHuntleigh. *Guidebook for Architects and Planners: Functional Design for Mobilisation and Ergonomics*. (2014).
38. Hsieh, H. & Shannon, S. E. Three approaches to qualitative content analysis. *Qual. Health Res.* **15**, 1277–1288 (2005).
39. Weber, R. *Basic Content Analysis*. (SAGE Publications, Inc., 1990). doi:10.4135/9781412983488.

40. Graneheim, U. H. & Lundman, B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Educ. Today* **24**, 105–112 (2004).
41. Shenton, A. K. Strategies for ensuring trustworthiness in qualitative research projects. *Educ. Inf.* **22**, 63–75 (2004).
42. Ryan-Nicholls, K. & Will, C. Rigour in qualitative research: Mechanisms for control. *Nurse Res.* **16**, (2009).
43. InterRAI. InterRAI. https://www.interrai.co.nz/ (2018).
44. Null, R. *Universal design: Principles and models*. (CRC Press, 2014).
45. International Health Facility Guidelines (iHFG). International health facility guidelines. (2017).
46. Strongwater, D. & Becker, F. The inclusion of the bariatric population providing greater patient access at a community based hospital. (2009).
47. New Zealand Roadmarkers Federation. NZRF Accessible parking guide. (2012).
48. Standards New Zealand. NZS 4121:2001 Design for access and mobility: Buildings and associated facilities. (2001).
49. Crook, K. Strategies for accommodating obese patients in acute care settings. *Hammes Company* https://www.hammesco.com/obesity_bariatrics_hospital_design.html (2009).
50. Dutta, S., Jain, K. & Siddharth, V. Retrofitting healthcare facilities for bariatric patients: A cost analysis study in a public sector hospital of a developing country. *Bariatr. Surg. Pract. Patient Care* **13**, 185–189 (2018).
51. Collier, P. *Exit width provisions for emergency egress*. (2008).
52. Australasian Health Infrastructure Alliance. Australasian health facility guidelines. (2009).
53. Collignon, A. Strategies for accommodating obese patients in an acute care setting. (2008).
54. International Health Facility Guidelines (iHFG). Part B: Health Facility Briefing & Design; 105 Inpatient Unit -Bariatric. (2014).
55. Gabel, L. & Musheno, E. Understanding the special needs of the bariatric population. *Popul. Des. Innov. Respect* (2010).
56. Gallagher, S. M. & Steadman, A. K. Tackling tough conversations: Recognising societal bias as a barrier to crucial conversations. Bariatric Times, 7(6), 1-28. *Bariatr. Times* **7**, 1–28 (2010).
57. New Zealand Gazette. Maximum contribution applying in each Territorial Local Authority region from 1 July 2019. *New Zealand Government* (2019).
58. Ministry of Health. *Long-term residential care for older people: What you need to know (revised 2019).* (Ministry of Health, 2012).
59. McCabe, M. P. *et al.* A randomized controlled trial to evaluate the effectiveness of a staff training program to implement consumer directed care on resident quality of life in residential aged care. *BMC Geriatr.* **18**, 287 (2018).
60. Sjögren, K., Lindkvist, M., Sandman, P. O., Zingmark, K. & Edvardsson, D. Organisational and environmental characteristics of residential aged care units

providing highly person-centred care: A cross sectional study. *BMC Nurs.* **16**, 1–9 (2017).
61. New Zealand Qualifications Authority. The New Zealand qualifications framework. (2016).
62. Open Polytechnic NZ. Working with older people course: Online learning. *Open Polytechnic* https://www.openpolytechnic.ac.nz/qualifications-and-courses/77328-working-with-older-people/ (2019).
63. Nursing Council New Zealand. Continuing Competence. https://www.nursingcouncil.org.nz/Public/Nursing/Continuing_competence/NCNZ/nursing-section/Continuing_Competence.aspx?hkey=6542ac27-9b56-4e89-b7ae-db445c5cb952.
64. Ministry of Health. *Healthy Ageing Strategy*. (2016).
65. Harris, J., Engberg, J. & Castle, N. Obesity and intensive staffing needs of nursing home residents. *Geriatr. Nurs. N. Y. N* **39**, 696–701 (2018).
66. Apelt, Ellert, Kuhlmey & Garms-Homolová. Temporal and structural differences in the care of obese and non-obese residents of full-time care facilities. *Pflege* **25**, 271–283 (2012).
67. Felix, H. C. *et al. Staff time and estimated labor cost to bathe obese nursing home residents: A case report*. https://papers.ssrn.com/abstract=1492703 (2009).
68. Baillie, L. *et al.* Care transitions for frail, older people from acute hospital wards within an integrated healthcare system in England: A qualitative case study. *Int. J. Integr. Care* **14**, (2014).
69. Bryan, K., Gage, H. & Gilbert, K. Delayed transfers of older people from hospital: Causes and policy implications. *Health Policy* **76**, 194–201 (2006).
70. The Kings Fund. Delayed transfers of care: a quick guide. *The King's Fund* https://www.kingsfund.org.uk/publications/delayed-transfers-care-quick-guide (2018).
71. Hogeveen, S. E., Chen, J. & Hirdes, J. P. Evaluation of data quality of InterRAI assessments in home and community care. *BMC Med. Inform. Decis. Mak.* **17**, 150 (2017).

APPENDICES

APPENDIX 1: THE NEW ZEALAND HEALTH STRATEGY ROADMAP ACTION 10

Support for older adults with high and complex needs	
Action 10	Involve health and other social services in developing shared care for older people with high and complex needs in residential care facilities or those needing support at home, so that older people and their family and whānau receive integrated support to live well. a. Enhance the role of shared-care plans, using lessons learned from the new model of disability support. b. Improve connections between primary care and support services delivered in people's homes and in the community. c. Work with the Ministry of Social Development and other social sector agencies to improve health and social outcomes for vulnerable older people and improve support for those who care for them at home. d. Review, together with service users, quality dimensions for aged residential care and home support. e. ACC, Health Quality and Safety Commission New Zealand (HQSC), DHBs and the Ministry of Health work jointly on injury prevention and rehabilitation to improve the quality of life for older people.

Source: Minister of Health. (2016).*New Zealand Health Strategy: Roadmap of actions* p. 13.[1]

APPENDIX 2A: DISEASE DIAGNOSIS AND TREATMENT FOR CURRENT STAY: AGGREGATED NATIONAL DATA

Item		Not present N (%)	Primary diagnosis / diagnoses for current stay n (%)	Diagnosis present, receiving active treatment n (%)	Diagnosis present & monitored but no active treatment n (%)
1.	Fractures (hip and other fractures)	214926 (95.9)	4075 (1.8)	2230 (1.0)	2969 (1.3)
2.	Alzheimer's disease	193169 (86.2)	24485 (10.9)	2551 (1.1)	3995 (1.8)
3.	Dementia other than Alzheimer's disease	145468 (64.9)	57252 (25.5)	5069 (2.3)	16411 (7.3)
4.	Stroke (CVA, hemiplegia)	172158 (76.8)	20953 (9.3)	12433 (5.5)	18656 (8.3)
5.	Multiple sclerosis	222737 (99.3)	1097 (0.5)	156 (0.1)	210 (0.1)
6.	Paraplegia	223249 (99.6)	647 (0.3)	54 (0.0)	250 (0.1)
7.	Parkinson's disease	212109 (94.6)	6597 (2.9)	4175 (1.9)	1319 (0.6)
8.	Quadriplegia	223830 (99.8)	205 (0.1)	61 (0.03)	104 (0.05)
9.	Heart disease (CHD & heart failure)	143627 (64.1)	19671 (8.8)	50970 (22.7)	9932 (4.4)
10.	Chronic obstructive pulmonary disease	196420 (87.6)	8927 (4.0)	13407 (6)	5446 (2.4)
11.	Mental health (anxiety, schizophrenia, bipolar)	181563 (81.0)	9293 (4.1)	21912 (9.8)	11432 (5.1)
12.	Depression	169623 (75.7)	9142 (4.1)	38009 (17.0)	7426 (3.3)
13.	Pneumonia	221689 (98.9)	781 (0.3)	949 (0.4)	781 (0.3)
14.	Urinary tract infection	210168 (93.7)	1683 (0.8)	8125 (3.6)	4224 (1.9)
15.	Cancer	192926 (86.1)	6654 (3.0)	5017 (2.2)	19603 (8.7)
16.	Diabetes mellitus	180616 (80.6)	7574 (3.4)	23016 (10.3)	12994 (5.8)

APPENDIX 2B: DEMOGRAPHIC AND ANTHROPOMETRIC CHARACTERISTICS BY FACILITY

Item	Variables	Total (N=2348)	Facility 1 (n=1305)	Facility 2 (n=838)	Facility 3 (n=205)
A	**Age in years**				
1	Mean ± SD	86±7.8	85±8.0	87±7.6	86±7.4
2	Range	44-105	44-105	50-104	63-102
B	**Gender, N (%)**				
3	Male	663 (28.2)	419 (32.1)	213 (25.4)	31 (15.1)
4	Female	1685 (71.8)	886 (67.9)	625 (74.6)	174 (84.9)
C	**Ethnicity, N (%)**				
5	European	2078 (88.5	1130 (86.6)	757 (90.3)	191 (93.2)
6	Maori	42 (1.8)	25 (1.8)	15 (1.8)	3 (1.5)
7	Asian	172 (7.3)	119 (9.1)	48 (5.7)	5 (2.4)
8	Pacific people	29 (1.2)	20 (1.5)	9 (1.1)	0 (0)
9	Middle Eastern/Latin America/African (MELAA)	18 (0.8)	7 (0.5)	7 (0.8)	4 (2.0)
10	Other	9 (0.4)	5 (0.4)	2 (0.2)	2 (1.0)
D	**Weight**				
11	Mean±SD	67.0±16.9	62.0±15.6	63.6±19.3	62.9±14.9
12	Min/max (Range)	24/264(240)	32/138 (106)	31/179 (148)	41/180 (139)
	Missing	*108*	*44*	*55*	*9*
E	**Height**				
13	Mean±SD	162.7±12.0	162.5±11.0	163.6±13.7	160.7±10.0
14	Range	140/198 (58)	142/198 (56)	140/194 (54)	140/182 (120)
15	*Missing*	*209*	*134*	*39*	*11*
F	**Calculated BMI N (%)**				
16	Very severely underweight	30 (1.3)	21 (1.6)	9 (1.1)	0 (0.0)
17	Severely underweight	31 (1.3)	20 (1.5)	11 (1.3)	0 (0.0)
18	Underweight	241 (10.3)	131 (10.0)	99 (11.8)	11 (5.4)
19	Normal healthy weight	1080 (46.0)	589 (45.1)	395 (47.1)	96 (46.8)
20	Overweight	518 (22.1)	264 (20.2)	183 (21.8)	71 (34.6)
21	Mild/Moderate obesity	158 (6.7)	107 (8.2)	38 (4.5)	13 (6.3)
22	Severe obesity	40 (1.7)	21 (1.6)	19 (2.3)	-
23	Extreme obesity	27 (1.1)	11 (0.8)	14 (1.7)	2 (1.0)
24	*Missing/not calculated*	*223 (9.5)*	*141 (10.8)*	*70 (8.4)*	*12 (5.9)*

APPENDIX 2C: DEMOGRAPHIC AND ANTHROPOMETRIC CHARACTERISTICS: NATIONAL AGGREGATED DATA

Item	Variables	Frequency N=224200	Percentage
A	**Age group**		
1	<50	862	0.4
2	50-59	2997	1.3
3	60-69	13362	6.0
4	70-79	43324	19.3
5	80-89	98834	44.1
6	90+	64820	28.9
7	Unknown	1	0.0
B	**DHB region**		
8	Central	44688	19.9
9	Midland	45524	20.3
10	Northern	67071	29.9
11	South Island	65991	29.4
12	Unknown	926	0.4
C	**Gender, N (%)**		
13	Male	76914	34.3
14	Female	147286	65.7
D	**Ethnicity, N (%)**		
16	European	201956	90.1
17	Maori	10284	4.6
18	Asian	5683	2.5
19	Pacific people	3933	1.8
20	MELAA*	1026	0.5
21	Other	1286	0.6
22	Missing data/ not identified	35	0.02
E	**Weight**		
23	Mean±SD	67.0±15.9	-
24	Min/max (Range)	35/120 (85)	-
25	*Missing/implausible*	*15855*	-
F	**Height**		
26	Mean±SD	163.5±9.1	-
27	Range	140/213 (50)	-
28	*Missing/implausible*	*21258*	-
G	**Calculated BMI, N (%)**		
29	Very severely underweight	1468	0.7
30	Severely underweight	2154	1.0
31	Underweight	17796	7.9
32	Normal healthy weight	84483	37.7
33	Overweight	59641	26.6
34	Moderately obese	25442	11.3
35	Severely obese	*8231*	3.7
36	Very severely obese	*3781*	1.7
37	Missing/not calculated	*21204*	*9.5*

**MELAA means Middle Eastern/Latin America/African*

APPENDIX 2D: DEMOGRAPHIC AND ANTHROPMETRIC CHARACTERISTICS: STRATIFIED BY DHB REGIONS

Item	Variables	DHB region				P-value
		Central N (%)	*Midland N (%)*	*Northern N (%)*	*South Island N (%)*	
A	**Age group**					<0.001
1.	<50	108 (0.2)	191 (0.4)	382 (0.6)	175 (0.3)	
2.	50-59	485 (1.1)	560 (1.2)	1181 (1.8)	759 (1.2)	
3.	60-69	2458 (5.5)	2643 (5.8)	4512 (6.7)	3689 (5.6)	
4.	70-79	9145 (20.5)	8261 (18.1)	13180 (19.7)	12560 (19.0)	
5.	80-89	20091 (45.0)	20609 (45.3)	28256 (42.1)	29483 (44.7)	
6.	90+	12401 (27.8)	13260 (29.1)	19559 (29.2)	19325 (29.3)	
B	**Gender, N (%)**					<0.001
7.	Male	15798 (35.4)	15335 (33.7)	23072 (34.4)	22378 (33.9)	
8.	Female	28890 (64.4)	30289 (66.3)	43999 (65.6)	43613 (66.1)	
C	**Ethnicity, N (%)**					<0.001
9.	European	40843 (91.4)	41314 (90.8)	55340 (82.5)	63617 (96.4)	
10.	Maori	2137 (4.8)	3293 (7.2)	3583 (5.3)	1236 (1.9)	
11.	Asian	725 (1.6)	340 (0.7)	4122 (6.1)	453 (0.7)	
12.	Pacific people	583 (1.3)	216 (0.5)	2909 (4.3)	217 (0.3)	
13.	MELAA*	122 (0.3)	197 (0.4)	592 (0.9)	114 (0.2)	
14.	Other	253 (0.6)	159 (0.3)	521 (0.8)	***353*** *.5)*	
D	**Weight**					<0.001
15.	Mean±SD	66.5±16.1	67.0±16.0	65.4±15.8	66.7±15.7	
E	**Height**					0.145
16.	Mean±SD	163.5±9.2	163.4±9.1	163.4±9.2	163.3±9.1	
F	**Calculated BMI, N (%)**					<0.001
17.	Very severely underweight	298 (0.8)	295 (0.7)	487 (0.8)	381 (0.6)	
18.	Severely underweight	464 (1.2)	418 (1.0)	695 (1.1)	571 (0.9)	
19.	Underweight	3591 (9.1)	3526 (8.5)	5868 (9.7)	4735 (7.8)	
20.	Normal healthy weight	16192 (40.9)	16552 (40.0)	26353 (43.6)	24982 (41.2)	
21.	Overweight	11679 (29.5)	12298 (29.7)	17099 (28.3)	18327 (30.2)	
22.	Moderately obese	4972 (12.5)	5567 (13.5)	6748 (11.2)	8052 (13.3)	
23.	Severely obese	*1638 (4.1)*	1868 (4.5)	2140 (3.5)	2560 (4.2)	
24.	Very severely obese	*803 (2.0)*	827 (2.0)	1095 (1.8)	1040 (1.7)	

**MELAA means Middle Eastern/Latin America/African*

APPENDIX 3A: DISABILITY AND AMBULANCE PARKING

		Facility 1		Facility 2	Facility 3
		Building 1	*Building II*	*N/A*	*N/A*
Disability Parking					
Designated disability parking		Yes	Yes	Yes	Yes
	Type	90^{o}	Angle	90^{o}	Parallel
	Length (m)	4.7	5.4	4.3	4.2
	Width (m)	3.2	2.5	3.9	2.8
Ambulance park					
Designated ambulance park		No	No	No	Yes
	Length (m)	-	-	-	5.2
	Width (m)	-	-	-	3.8

APPENDIX 3B: FACILITY ENTRANCES

		Facility 1		Facility 2	Facility 3
		Entrance 1	*Entrance 2*	*N/A*	*N/A*
Doorway One					
Opening space dimensions					
	Height(m)	2.3	3.4	2.0	2.0
	Width(m)	1.4	1.3	1.6	1.3
Opening space characteristics					
	Automatic	Yes	Yes	Yes	Yes
	Opening	Sliding	Sliding	Sliding	Sliding
	Handrails	No	No	No	No
	Accessibility ramp	Yes	Yes	No	No
`Doorway Two					
Opening space dimensions					
	Height (m)	2.2	2.4	2.0	2.0
	Width (m)	1.4	1.4	1.7	1.7
Opening space characteristics					
	Automatic	Yes	Yes	Yes	No
	Opening	Sliding	Sliding	Sliding	Opens into building
	Handrails	No	No	No	No
	Accessibility ramp	Yes	Yes	No	No

APPENDIX 3C: EMERGENCY EXITS DOORWAY

		Facility 1		Facility 2	Facility 3
		Exit 1	Exit 2		
Doorway dimensions					
	Height (m)	2.2	2.2	1.9	2.0
	Width (m)	1.4	1.2	1.4	1.0
Doorway properties					
	Exit door manual	Yes	Yes	Yes	Yes
	Door opens out of room	Yes	Yes	Yes	Yes
	Door obstruct access	A little	A little	None	A lot

APPENDIX 3D: CORRIDORS

	Facility 1		Facility 2	Facility 3
	Corridor 1	Corridor 2		
Width of corridor (residents' section) (m)	2.0	1.8	1.4	1.2
Continuous corridor handrails	Yes	Yes	No	Yes
Sitting areas along corridors	No	No	No	Yes
Seating areas accessible to bariatric patients	No	No	No	Yes

APPENDIX 3E: PATIENT AREAS- BEDROOM

	Facility 1				Facility 2	Facility 3
	Bedroom 1	*Bedroom 2*	*Bedroom 3*	*Bedroom 4*	*Bedroom 5*	*Bedroom 6*
Doorway dimensions						
Height (m)	2.0	2.0	2.0	2.0	1.9	2.0
Width (m)	1.2	1.4	1.2	1.2	0.8	1.2
Manual opening	Yes	Yes	Yes	Yes	Yes	Yes
Door opens into the room	Yes	Yes	Yes	Yes	Yes	Yes
Does door obstruct access	None	None	A little	None	A little	None
Bedroom dimensions						
Height of ceiling	2.7	2.6	2.7	2.4	2.4	2.4
Size, (m^2)	13.5	13.9	10.3	9.7	9.5	10.6
Length (m)	4.1	4.0	3.2	2.8	3.5	3.7
Width(m)	3.2	3.4	3.2	3.4	2.7	2.8

APPENDIX 3F: TOILET AND HYGIENE AREAS

	Facility 1		Facility 2	Facility 3
Ensuite toilet	**Ensuite 1**	**Ensuite 2**		
			-	-
Does bedroom have an ensuite toilet	Yes	Yes	Yes	Yes
Doorway				
Dimensions of doorway				
Height	2	2.1	2.2	2.0
width	0.8	0.8	0.9	0.6
Characteristics of doorway				
Doorway manual	Yes	Yes	Yes	Yes
Opening of doorway	Cavity slider	Cavity slider	Opens out of room	Opens into room
Door obstruct resident access	A great deal	A lot	None	None
Toilet area				
Ensuite toilet: Size				
Height (ceiling)	2.4	2.7	2.4	2.4
size (m^2)	4.0	3.0	3.4	1.3
Length (m)	2.0	1.5	2.9	1.4
Width (m)	1.9	2	1.2	0.9
Characteristics of toilet area				
Is toilet floor or wall mounted	Floor	Wall	Floor	Floor
Sink, wall or floor mounted	Wall	Wall	Wall	-
Grab rails present	Yes	Yes	Yes	Yes
Towel rail present	Yes	No	Yes	Yes
Type of grab rails	Wall fixed	Wall fixed	Wall fixed	Wall fixed
Hygiene				
Where can the residents take a shower	Ensuite	Ensuite	Ensuite	other
Is the shower a wet room or cubical style	-	Wet room	Wet room	Wet room
Dimensions of shower				
Size (m^2)	4.0	-	3.4	4.4
Length (m)	2.0	-	2.9	2.2
Width (m)	1.9	-	1.2	1.9
Grab rail support	L-shaped	Angled	Horizontal	Angled
Bathtub?	No	No	Yes	No

APPENDIX 3G: LOUNGE AND DINING ROOM

		Facility 1			Facility 2			Facility 3		
		Lounge 1	**Lounge 2**	**Lounge 3**	**Lounge 1**	**Lounge 2**	**Lounge 3**	**Lounge 1**	**Lounge 2**	**Lounge 3**
Size of doorway										
	Height	2	2.4	-	2.0	2.0	2.0	2.0	2.0	2.0
	Width	1.3	4.1	-	1.1	1.2	0.9	1.7	1.6	0.9
Characteristics of doorway										
	Doorway has door	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
	Doors manual	Yes	-	-	Yes	Yes	Yes	Yes	Yes	Yes
	Door opens out of the room	Yes	-	-	Yes	Yes	Yes	No	No	No
	Door restrict access	Little	-	-	Little	Little	None	None	None	None
Size of lounge										
	Height of ceiling	2.2	2.6	2.6	3.5	2.3	2.1	2.2	2.2	2.0
	Size (m^2)	163.4	45.3	24.7	86.8	79.4	47.6	85.5	205.1	43.7
	Length	9.4	10.9	5.1	11.7	11.2	5.3	12.4	21.5	11.2
	Width	17.4	4.2	4.8	7.4	7.1	9	6.9	9.5	3.9

APPENDIX 3H: FACILITY LIFT

		Facility 1		Facility 2[ix]	Facility 3
		Lift 1	Lift 2		
Immediate floor space going into lift					
	Distance to far wall (m)	2.8	4.5	4.4	-
	Floor space (m^2)	3.6	5.4	4.0	-
	Weight limit (kg)	2000	2000	780[x]	-
Lift opening door space-					
	height	2.1	2.1	2.0	-
	width	1.3	1.2	0.9	-
Size of lift					
	Lift space (m2)	3.6	3.6	1.3	-
	length	2.1	2.7	1.2	-
	width	1.3	1.3	1.1	-
Immediate floor space that lift opens into					
	Distance to far wall (m)	2.7	4.0	3.8	-
	Floor space (m2)	3.5	4.8	3.4	-

[ix] At the time of data collection, the main lift had been closed for repairs. The measurement found here therefore is for the accessory lift.

APPENDIX 4: BARIATRIC EQUIPMENT AVAILABLE AT EACH FACILITY IN MARCH-MAY 2019

Equipment	Facility 1	Facility 2	Facility 3
Ceiling hoist SWL 200kg	6 (Building B)	-	6
Mobile gantry hoist SWL 200kg	-	-	2
Sara Maxi 500 mobile sling hoist SWL 227kg	1	1	1
Sara 3000 mobile standing hoist SWL 200kg	1	1	1
Bariatric bed SWL	-	1 (purchased for resident)	-
Bariatric chair SWL	1	1	
Bariatric orthopaedic chair SWL	-	-	-
Bariatric commode SWL	1	1	1
Bariatric shower chair SWL	1	1	1
Bariatric wheelchair SWL	1 (on trial from company)	-	-
Bariatric walker SWL	1	-	-

All facilities used ArjoHuntleigh and Cubro as their chosen equipment provider