Exploring Relationships between the Residential Neighbourhood Environment and Well-being Outcomes in New Zealand Residing Older Adults.

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Abstract

As New Zealand's population continues to age, we face the increasing challenge of supporting our older adults to live well for longer. Non-communicable diseases have taken over from infectious diseases as the leading cause of mortality, leaving much of our older population living longer with increased health concerns. Amid rising inequality and as the pressure on our health system rises, the health field turns its attention to the social determinants of health for the answer. Environmental influences on well-being have garnered particular attention in recent years. Older adults are theorised to be more susceptible to the neighbourhood environment as functional ability decreases. However, there have been inconsistencies in the research regarding objective and subjective measures of the neighbourhood. This study addresses two objectives; to determine the relationships between objective and subjective measures of the neighbourhood and to test the hypothesis that older adults who reside in more desirable neighbourhoods report higher levels of well-being. The study comprises two population samples; the first comprises 4351 New Zealand residing adults aged 55-92 years old, the second consists of a subgroup of 60 participants aged from 55- 82. Bivariate correlations and multiple regression analysis were used to evaluate the data. The study found Natural Elements (trees, public grass, and sounds of nature) and objective measures of the environment to be the most strongly associated with positive perceptions of Neighbourhood Quality. Perceived Neighbourhood Quality, but not objective neighbourhood features, were predictive of well-being outcomes as measured by Loneliness, Depression, and Anxiety in older adults. The study was limited by the low availability of objective assessments and corresponding subjective assessments and the unknown impact of the Covid-19 pandemic. While causality cannot be claimed, the study found evidence of relationships between Neighbourhood perceptions and well-being in older adults.

Key Words: Healthy Ageing, Older Adult Well-being, Neighbourhoods, Loneliness, Depression, Anxiety

Dedication

This work is dedicated to my Family and Supervisor; this would never have been completed without their unwavering support and faith.

Lucas, your patience when mum had to “work” has been amazing; I could not have asked for a better inspiration to get this finished. Thank you for the pictures in my notebooks and reminding me there is a world outside my laptop.

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Exploring Relationships between the Residential Neighbourhood Environment and Well-being Outcomes in New Zealand Residing Older Adults.

A topic receiving increasing attention worldwide is that of the world's ageing population; medical and technological advancements and improved living conditions are thought to contribute to our increasing longevity (World Health Organization, 2018). This increased lifespan and an overall drop in fertility and birth rates contribute to an exponentially growing aged population. Following the pattern set by much of the world, New Zealand is experiencing its own ageing population. In 2018 15.2% of the population was 65 or over, and by 2043 that number is expected to hit 23.1% (Environmental Health Intelligence New Zealand, n.d.).

However, despite medical advances, an ageing population is not without its drawbacks, and older adults are not without their medical ailments (Ministry of Health, 2017a). Non-communicable diseases have overtaken infectious diseases as the leading cause of disability and mortality, thus leading to adults living longer with medical conditions and increasingly unmet health needs (Blakely et al., 2019). In addition, several conditions are of increased prevalence in older adults. As a result, they have the propensity to cause a significant decrease in quality of life, namely loneliness (P. Dykstra, 2009), anxiety (Lenze & Wetherell, 2011), depression (Fiske et al., 2009), neurodegenerative diseases, arthritis, stroke, heart disease, and chronic pain (Ministry of Health, 2017b).

As noted above, there are two basic driving forces behind this phenomenon: increased life expectancy and fluctuations in birth rates. New Zealand's current life expectancy is 82.5 years compared with just 69.22 years in 1950 (Macrotrends, 2021). United Nations project this number will increase to 88.47 years by 2070, just 50 years from now (Macrotrends, 2021). New Zealand's birth rates hit an all-time high between the mid-1940s and early 1970s; at its peak in the 1960s, the fertility rate was above four births per woman (Pool & Du Plessis, 2017). The eldest of these 'baby boomers' are currently in their mid to late-70's, with the younger of the cohort entering their mid-50's. With an increase in women seeking further education and focusing on careers, women are starting to have children later and hence having fewer children (Ní Bhrolcháin & Beaujouan, 2012), a trend

noted in most countries worldwide (Pool & Du Plessis, 2017). The 1970s-80s saw the largest drop in birth rates in New Zealand, with the trend slowly declining to an estimated 1.87 births per woman in 2020 (United Nations, 2019). With 'baby boomers' continuing to enter retirement years and a steadily declining number of people entering work age, it is more crucial than ever to address well-being in older age and prepare our environments to meet the population's needs (Jackson & Cameron, 2018).

Living well in old age is about more than being healthy or free from illness it is about enjoying the fullness of life despite any ailments. The World Health Organisation (WHO) defines healthy ageing as "the process of developing and maintaining the functional ability that enables well-being in older age"(World Health Organization, 2020b, para. 3). It should be noted that WHO's definition does not necessitate the absence of health conditions or lack of impairment, but rather a functional ability that allows participation in activity resulting in a rich and meaningful life.

To reflect this more holistic vision of ageing well, we will refer to well-being rather than health going forward. So, although we focus on the mental health outcomes of loneliness, depression, and anxiety, these will be discussed in terms of supporting or harming the well-being of older adults. We do not distinguish mental well-being from physical well-being because the binary idea of mind and body is somewhat arbitrary, considering increasing evidence that no such divide exists. Over and over, studies from both the human and biophysiological sciences demonstrate that our cognitive processes affect our bodily functions and vice versa (Brondino, 2017; Kim et al., 2020; Soria et al., 2018; Windle et al., 2010). Indeed our peripheral nervous system shows that the brain and body are unquestionably interconnected and that events in one almost invariably causes a change in the other (Breit et al., 2018; Moraes et al., 2018).

A good example of functioning as a measure of well-being and the transition to a focus on the social determinants of health can be found in the International Classification of Functioning, Disability, and Health (ICF). First introduced in 1980 for trial purposes (World Health Organization, 2002) is a framework with several related categories: health conditions, impairments, activities, participation, environmental factors, and personal factors. At that time, its relative, the International Statistical Classification of Disease and Health-Related Problems (ICD), was already in its 9th edition (Topaz et al., 2013). The two

frameworks are designed to be used alongside one another, but they have vast differences in focus and conceptual basis, reflecting the changing focus over time. For example, the ICD classifies disease and primarily tracks disease outbreaks and mortality (World Health Organization, 2016). However, the ICF is a measure of health in a more holistic sense, taking into consideration both intrinsic and extrinsic factors that influence health through a biopsychosocial lens (World Health Organization, 2002).

Depression

Defining Depression

Alongside loneliness, depression is one of the biggest health challenges faced by older adults, approximately 13.6% of the New Zealand Population aged 55+ has mild or greater depression (Ministry of Health, 2017a). Therefore, depression, particularly clinical depression or Major Depressive Disorder, has been a major area of interest due to this risk of suicide, which claims many lives annually in NZ (11 per 100,000) and worldwide. While teenagers and young adults have our highest rates of suicide at (15-24yrs = 16.8 per 100,00), suicide is a serious concern for older adults with over 65's dying by suicide at a rate of 9.2 per 100,000 (Ministry of Health, 2019). Aside from increased mortality, it is undisputable that a life lived with depression lacks a level of quality of life that people would want to experience in their 'golden years' (Chen & Austin, 2019; Fiske et al., 2009).

There are several depressive disorders in the Diagnostic and Statistical Manual of Mental Health Disorders 5th edition (DSM-5) which are collectively characterised by a "sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's ability to function" (American Psychiatric Association, 2013, p. 155). While most people will experience symptoms of depression or refer to themselves as depressed at some stage of their life, most of these instances will be transient shifts in mood that do not meet the criteria for clinical depression. The classic presentation of depression, in its clinical sense, is Major Depressive Disorder which requires the presence of at least five symptoms for a duration of at least two weeks (American Psychiatric Association, 2013). The DSM-5 states those five or more symptoms should be any of: low mood, sadness, or emptiness; anhedonia or the loss of interest in previously enjoyed activities; significant changes in weight (loss or gain); sleep disturbances (early waking or hypersomnia); psychomotor agitation or retardation; consistent fatigue or loss of energy;

feelings of worthlessness or guilt; diminished concentration or indecisiveness; recurrent thoughts or preoccupation with death (American Psychiatric Association, 2013). These should all be experienced in the context of distress and cause significant functional disruption.

The Ambiguity of Depression in Older Age

Depression in older adults is often overlooked due to reporting and presentation, as even though it is essentially the same experience in older adults as it is in their younger counterparts, it typically manifests differently (American Psychiatric Association, 2013; Fiske et al., 2009). Older adults with depression are more likely to display cognitive changes, physical symptoms, and loss of interest and less likely to report feelings of low mood (Fiske et al., 2009). Further complicating for older adults is the tendency to suffer memory issues as a symptom of depression (American Psychiatric Association, 2013; Kang et al., 2014). This symptom presentation is particularly problematic because memory issues are often thought of as synonymous with dementia or Alzheimer's disease. While the term is not isolated only to depression, the term "pseudo-dementia" is most often associated with the cognitive profile of older adults with depression (Kang et al., 2014). Once these conclusions are made, it can be very easy to dismiss other symptoms of depression and even normal age-related cognitive changes as further evidence for dementia.

It is theorised that loneliness is a significant risk factor for depression in older adults. Once loneliness increases in chronicity, the associated low mood becomes more pervasive, encouraging the kind of negative cyclic cognitions and withdrawal behaviours that characterise MDD (Domènech-Abella et al., 2019). Kowitt et al. (2020) found loneliness the most strongly associated with depression of all neighbourhood characteristics they investigated. However, from what we know of the characteristics of MDD, the relationship is likely much more complex than a single direction causal one. For example, Domènech-Abella et al. (2019) found several distinct patterns of the relationship between loneliness and depression, suggesting that both relationship type and size mediated the relation between the two. People with MDD typically experience little pleasure from once-coveted activities, participate in fewer activities, including social ones, and develop pervasive negative cognitions about themselves, others, and the future (Beck, 2011; Sadock et al., 2014). It has been suggested that the main underlying cause of depression in older adults is

the curtailment of daily activity (Fiske et al., 2009), thus fitting with a co-morbid model of loneliness and depression.

Depression and Well-being

While depression is associated with morbidity via suicide risk, the reality is that not all older adults with depression will suicide, but most will still experience increased morbidity. One measure of the well-being cost of depression is the Disability Adjusted Life Years (DALY) reported as per 100,000 people, where each DALY represents one year of healthy life lost. The reported global DALY (2017) for older adults aged 50-69 is 926, and for older adults, 70+ is 926.82 (Our World in Data, n.d.-b). For comparison, the next closest group was 15-49 year-olds with a DALY of 647.75 (Our World in Data, n.d.-b). For older adults, each of those years lived with depression may involve a plethora of additional issues that affect the individual and their family and wider community. For example, depression is associated with decreased marital happiness (Chen & Austin, 2019), daily activity (Sadock et al., 2014), cognitive performance (Cuijpers et al., 2013), caregiver burnout (which ironically is a high-risk factor for loneliness and depression) (Lee & Montelongo, 2016; Zebrack & Lim, 2004), poorer physical health (Brondino, 2017).

Anxiety

Defining Anxiety

Anxiety is interesting in that it is both a universal and very personal experience. That is to say that almost everyone will experience anxiety; it is a normal and physiologically adaptive process designed to help the body identify and survive threats (Levine, 2018; Porges, 2018). But how each of us identifies and reacts to threats is intrinsically different based on several variants such as biological responsiveness, our previous exposure to and experience of threats, and our access to protective and supportive resources (Baksh et al., 2021). Certain anxiety experiences are so common that developmental psychologists have been able to identify trends in anxieties by developmental age; for example, loud noises in infancy, social anxiety in the early teens, health-related anxieties become more prevalent in the middle ages, while the later years are predominated by generalised anxiety (Byrne, 2002; Lenze & Wetherell, 2011). Overall, people with anxiety tend to experience symptoms in four categories: Physiological, behavioural, cognitive, and emotional. The extent to which they experience symptoms from each category will vary based on the anxiety type and the

individual. For instance, panic attacks are characterised by high physiological and emotional responses with moderate behavioural and cognitive responses, where someone with Obsessive Compulsive Disorder is likely to experience high levels of cognitive and behavioural activation (American Psychiatric Association, 2013).

Anxiety is the most prevalent mental health challenge in older adults; its prevalence surpasses depression and dementia (Byrne, 2002; Lenze & Wetherell, 2011). Clinical anxiety affects around 30% of the population and is characterised by excessive fear or anxiety coupled with behavioural disturbance (American Psychiatric Association, 2013; Creighton et al., 2018). Like depression, there are many types of anxiety ranging from the more specific anxieties (phobias, panic disorder, and obsessive-compulsive disorder) to the more general anxieties (such as generalised anxiety disorder) (American Psychiatric Association, 2013). Although Lenze and Whetherall (2011) note a general positive correlation between increasing age and generalised anxiety, the exception to this general rule is 'Fear of Falling', which is a very specific anxiety condition almost exclusively affecting older adults.

Anxiety in Older Adults

While anxiety may become more problematic in older adulthood, the prevalence of anxiety disorders tends to fall with age (Byrne, 2002; Thomas et al., 2016). Despite this drop, the prevalence has contributed to the false belief that anxiety is a normal part of ageing. At the same time, there is a correlation between age and Generalised Anxiety Disorder (Byrne, 2002; De Vito et al., 2020; Lenze & Wetherell, 2011); it should not be considered a normal aspect of ageing. Anxiety is largely comorbid with other mental health disorders such as depression as well as being associated with other chronic illnesses, somatic pain experiences, and a higher risk of falls (Bryant et al., 2008; Creighton et al., 2018; De Vito et al., 2020; Gum & Cheavens, 2008; Sadock et al., 2014). Saddock et al. (2014) suggest comorbidity rates of between 50-90% for generalised anxiety disorder, with as many as 25% going on to experience panic disorder.

Generalised Anxiety Disorder (GAD), which is characterised by general or non-specific anxiety similar in content to 'normal' worry, is associated with a decreased quality of life and greater functional impairment (De Vito et al., 2020). Individuals with GAD are

most likely to display cognitive, behavioural, and emotional symptoms with less severe physiological involvement. Anxiety disorders are responsible for 429.08 Disability Adjusted Life Years (DALYs) in adults aged 50-69 and 355.64 in adults aged 70+ (Our World in Data, n.d.-a). Interestingly, anxiety rates for those in supported aged care are higher than community-dwelling peers; Creighton et al (2018) find prevalence rates of 19.4% and 11.7% for clinical and subclinical anxiety across 12 aged care facilities in Melbourne, Australia. New Zealand anxiety statistics suggest a prevalence of 9% in adults aged 55+ (Stafford et al., 2003), more recent health survey data suggests a prevalence closer to 11.8% (Ministry of Health, 2017a)

Biological Mechanisms of Anxiety

Anxiety conditions, while having many other symptoms have a very formal biological perspective in that we are biologically programmed to maintain optimal safety and ensure our survival. A large portion of the central and peripheral nervous systems has a hand in the priming, activation, and maintenance of anxiety (Schoenberg & Scott, 2011). We have two biological pathways in the body dedicated to activating physiological responses, the hypothalamic-pituitary-adrenal (HPA) axis and the vagal nerve, which makes up much of the peripheral nervous system, the latter of which is discussed in the next chapter, as well as structures such as the hippocampus, amygdala, and prefrontal cortex which shape our emotional, cognitive, and behavioural experience (Lezak et al., 2012).

The thalamus, medially located within the brain, is a major receptor of input to the brain and relays information directly to the HPA axis, starting with the Hypothalamus, which is responsible for the majority of the body's homeostatic control, including the fight-flight-freeze response, which is activated during anxiety and stress (Anderson, 2017; Lezak et al., 2012). It does so by relaying chemical messages to the pituitary glands, which activate the adrenal glands to release cortisol, thus activating the sympathetic nervous system. The sympathetic nervous system increases the acuity of lifesaving functions by mobilising energy stores, directing additional nutrients to muscle tissues through increased blood flow, increasing breathing rate to compensate for higher muscle activity, inhibits the prefrontal cortex, and heightens the senses (Anderson, 2017; Lezak et al., 2012). Simultaneously it initiates the temporary inhibition of non-essential bodily functions such as salivation, digestion, and sexual functioning (Anderson, 2017). The combined effects produce the

physical symptoms of anxiety, flushing or increased heat, dizziness, dry mouth, rapid heart rate, muscular tension, impaired decision making, loss of libido, urinary and faecal incontinence. The hypothalamus is also associated with forming 'fear associations' in the hippocampus and the amygdala, which helps mediate anxiety and fear responses in the future (Lezak et al., 2012; Schoenberg & Scott, 2011).

While sympathetic activation is helpful and responsible for amazing feats of human survival in the short term, it is far from the perfect system. For starters, the system is susceptible to activation in response to non-threatening stimuli, can be manipulated by incoming stimuli relying heavily upon bias and schemas, and long-term activation leads to the down regulation of the system and decreased immunity (Hek et al., 2013; Moraes et al., 2018; Soria et al., 2018). Ultimately the neuroinflammation which accompanies the immune responses to long-term anxiety accumulates, contributing to depression, further anxiety, and neurodegenerative conditions such as dementia.

Loneliness

Defining and Conceptualising Loneliness

Loneliness is a subjective state in which people's social needs are not fulfilled by their current social participation (Perlman & Peplau, 1981). It is not merely the presence or absence of social interaction but rather an interplay between the desired social interaction and the quantity, nature, and quality of the achieved social interactions (P. Dykstra, 2009). For example, Hawkley and colleagues (2008) found that loneliness was negatively associated with social network size but not with the frequency of one's social interactions.

While loneliness can be experienced at any age and does not specifically relate to older adults, many of the socio-demographic characteristics associated with loneliness correlate with experiences of ageing (van den Berg et al., 2016). These include lower income, level of education, living arrangements, and perceived neighbourhood environment (de Jong Gierveld & van Tilburg, 2010a; Hawkley et al., 2008; van den Berg et al., 2016). Furthermore, older adults are again at higher risk of the ill effects of loneliness as the risk and its effects are accumulative across the lifetime. For example, a New Zealand study has linked loneliness and social isolation in childhood to an increased risk of cardiovascular disease in adulthood (Caspi et al., 2006). While Shiovitz- Ezra & Ayalon (2010) found that

those chronically lonely were at a higher risk of cardiovascular disease than those who were regarded situationally lonely, and Martìn-Marìa and colleagues (2020) found that those experiencing chronic loneliness were more likely to experience major depression than those experiencing transient loneliness.

Robert Weiss (1973) proposed two distinct dimensions to loneliness in his work; Social loneliness, which results from an insufficient social network, and emotional loneliness, related to having secure attachment figures. This differentiation of social and emotional loneliness has been backed by several studies (see: Dahlberg & McKee, 2014; De Jong Gierveld & Van Tilburg, 2010a; Dykstra, 2009; Dykstra & Fokkema, 2007). Dahlberg and McKee (2014) found that being male, widowed, low well-being, low self-esteem, low-income comfort, low contact with family, low contact with friends, low activity, low perceived community integration, and in receipt of community care was predictive of social loneliness. However, being widowed, low well-being, low self-esteem, high activity restriction, low-income comfort, and non-receipt of informal care being risk factors for emotional loneliness. So, while some factors contribute to a universal experience of loneliness, there are enough differences to warrant the conceptual separation of social and emotional loneliness (de Jong Gierveld & van Tilburg, 2006, 2010a). This differentiation between the social and emotional aspects of loneliness help to explain why some people experience loneliness despite consistent social inclusion and why some individuals flourish socially with smaller social circles (Dahlberg & McKee, 2014).

Loneliness and Well-being

Regardless of the variability in social needs between people, studies identified loneliness as an important indicator of health risk comparable to smoking (Hawkley & Cacioppo, 2007). Loneliness, which affects an estimated 25% of the older population (van Beljouw et al., 2014), is associated with increased morbidity and mortality, which grows stronger the more chronic the loneliness experience. For example, many studies support a causative relationship to mental health and cognitive ailments such as depression, suicidality, anxiety, personality disorders, and cognitive decline including Alzheimer's and executive functioning deficits, (Hawkley & Cacioppo, 2010; Tiwari, 2013) as well as physiological ailments such as dysregulated immune function, cardiovascular disease,

coronary heart disease, and stroke (Caspi et al., 2006; Hawkley et al., 2010; Hawkley & Cacioppo, 2010; Holt-Lunstad & Smith, 2016; Tiwari, 2013).

Holt-Lunstan and Smith's (2016) study found the effects of loneliness on cardiovascular risk to be comparative to that of smoking 15 cigarettes per day and greater than the risk associated with hypertension and obesity alone. In addition, studies by Penninx et al. (1997), Thurston & Kubzansky (2009), and Shiovitz-Ezra& Ayalon (2010) have all shown the propensity for loneliness to predict all-cause mortality, even when adjusting for factors such as age, race, sex, and other health factors such as smoking and chronic disease.

Humans as Social Beings: Mechanisms of Loneliness

Humans are, by nature, social beings; despite individual variations in social needs, we are generally not designed to thrive in the absence of social interaction (van der Kolk, 2018). From an evolutionary perspective, social skills and interaction have evolved to ensure the safety and survival of the individual and species (Bowlby, 1973). It was historically thought that social connection with loved ones was only important from infancy through to about twelve years old, at which point we developed an inner sense of self and safety, allowing us to navigate the uncertainty of life autonomously.

Modern attachment theory, however, tells us that this need for safe, stable attachment stays with us for life, a notion which Weiss would acknowledge when identifying what he believed to be the six Social needs of humans; Attachment, Social Integration, Nurturance, assurance of worth, Sense of Reliable Alliance, and Guidance (DiTommaso& Spinner, 1997). Bowlby further hypothesised that no one relationship could suffice all six needs, nor could multiple friendships substitute for a close intimate attachment figure. The loss of these attachments or an inability to access attachment figures causes distress to the individual, leading to poor health outcomes both physically and mentally. The transition into older adulthood can be particularly detrimental to social interaction due to retirement, the passing of friends and spouses, families living further apart (Dahlberg & McKee, 2014; de Jong Gierveld & van Tilburg, 2010b), decreased access to transport (van den Berg et al., 2016), and increased prevalence of chronic health conditions and their increased burden on the individual's reserves (Zebrack & Lim, 2004).

While the exact mechanism for how loneliness causes increased mortality is not fully understood, it is theorised to result from long-term stress via the endocrine (HPA axis) system and the Automatic Nervous System (ANS) via the Vagal Nerve. Cortisol, the endocrine chemical most associated with stress, is often found in increased concentrations in lonely individuals, which provides a clue as to stress being a major player in line with the stress theory (Hawkley & Cacioppo, 2010). Furthermore, Jaremka et al. (2013) found that lonely individuals experienced a greater increase in pro-inflammatory cytokines when exposed to stress than those who were less lonely, indicating that loneliness increases our susceptibility to the negative effects of Stress. Similarly, Dantzer et al. (2008) found that injecting individuals with pro-inflammatory cytokines, which naturally occurs during prolonged stress, evoked behaviours that mimic social isolation. Further evidence for a stress-based aetiology is convincingly laid out in Steven Porges' Polyvagal Theory which, like Bowlby's attachment theory, proposes that Social Engagement is crucial for self-regulation of emotions, feelings of safety, and pleasure and meaning (van der Kolk, 2018).

The Vagus nerve, also known as the tenth cranial nerve, descends from the medulla oblongata in two pathways (Porges, 2018). The vagal nerve innervates most thoracic and abdominal organs from the throat down to the large colon and makes up a large portion of the autonomous nervous system (Anderson, 2017; Lezak et al., 2012). The vagus nerve has two pathways through the body; the myelinated ventral or smart vagus and the second, the unmyelinated dorsal vagal nerve. The ventral vagal nerve or the 'vagal brake' regulates the body's natural mobilisation state, while the dorsal branch is responsible for the 'Freeze or Faint' response (Anderson, 2017; van der Kolk, 2018; Van der Kolk, 2015). The Ventral and Dorsal portions of the Vagus nerve respond to external perceptive input, which Porges terms 'neuroceptive input'. For example, the ventral portion responds to feelings of safety in our environment and social interactions. In contrast, the dorsal portion responds to danger cues by initiating a withdrawal from social interaction to a state of self-protection and dissociation from the environment (Levine, 2018).

Steven proposes a three-level, hierarchical security system responsible for our stress and trauma responses. These levels are 'safety', regulated by the social engagement system and ventral vagus; 'danger', the culmination of increased sympathetic mobilisation and decreased ventral vagal activity; and 'life threat', regulated by the Dorsal vagal or reptilian

brain, which results in a full parasympathetic immobilisation of the body (Porges, 2018; van der Kolk, 2018). The ventral vagus is the evolutionarily younger of the two and developed to allow social and nurturing behaviours, which rely on an intricate balance of sympathetic mobilisation and parasympathetic immobilisation.

When exposed to potential danger, the ventral vagus carefully navigates social engagement by evaluating incoming social cues and environmental stimuli. For example, if a stranger bumps you in the street, your ventral vagus, the primary and faster security system, will initialise social engagement. This nuanced way of gauging and re-establishing safety may include analysing the others' body and facial language, averting the eyes, lifting vocal tone, apologising, reasoning, or recruiting physical backup or emotional support from others. For example, if the person smiles and apologises for being so clumsy, signalling safety, your ventral vagal would allow you to mobilise to acknowledge the person smile back, therefore, placating the stranger and having now successfully navigated the potential danger. If, instead, the person glared at you might apologise yourself. If they made further threatening advancements, your ventral vagal system would slow, allowing the body to succumb to sympathetic arousal via the HPA axis, which mobilises the body by directing energy resources to the heart, lungs, and muscles and shutting down the frontal lobe function with it. This initial secondary defence system prepares the body to run away or overpower the would-be assailant, fight or flight. If the fight or flight action fails to deliver you from harm, i.e., you are overpowered or can't run, the body will experience parasympathetic shutdown via the dorsal vagus, which feigns death or causes the body to expel excretions to make it a much less desirable target. You may have seen an animal frightened so severely it defecates itself then appears to have died. This tertiary defence system is the older of the two vagal responses and has existed in our reptilian predecessors.

Porges' argument that we are continuously scanning our social and physical environment to assess our safety or the presence of danger cues lays a solid biological foundation for the proposed relationship between the physical environment and loneliness that this thesis proposes exists. As we explore in the following paragraphs, many studies have found relationships between perceived neighbourhood environment, experiences of loneliness (Domènech-Abella et al., 2017; van den Berg et al., 2016) and general satisfaction (Black & Jester, 2020). Many of these studies have relied upon 'perceived environment'

adding weight to stress as a moderator in the Loneliness- environment relationship. Older adults who are securely attached would be more inclined to perceive their environment favourably as they have a greater sense of safety.

Physical Environments

Defining the Physical Environment

The physical environment includes both the natural environment (i.e. trees, beaches, rivers, and land elevation) and the built environment (i.e. buildings, roads, amenities, recreational facilities) (Keleher & MacDougall, 2016). A review of the existing literature shows that, in terms of older adults, most studies tend to focus on the built aspects of the environment, such as housing, parks, and roads (Black & Jester, 2020; Kowitt et al., 2020; van den Berg et al., 2016; Winters et al., 2015) with the social aspects of the environment given attention to a lesser extent. This emphasis is true also of WHO; their Global Network of Ageing-Friendly Cities and Communities focus' on core features of the built environment (housing, transportation, outdoor spaces, and public buildings) (Rémillard-Boilard et al., 2021) but also asserts the importance of social aspects of community inclusion and feelings of safety.

A systematic review of the literature by Peters et al. (2020) found wide discrepancies in the definition of the neighbourhood. Even the geographical boundaries of a neighbourhood are ill-defined within the field, with little consensus between studies and even less between objective and subjective measures of the neighbourhood. They cite geographical boundaries ranging from a 5-minute walk from a designated landmark, a 50 km radius from the residence in question, Census-defined areas, and entire postcodes.

The Physical Environment as a Determinant of Well-being

The physical environment moderate's well-being via three key areas, as identified by Kowitt et al. (2020) and generally corroborated by researchers such as WHO (World Health Organization, 2020a) and Keleher and MacDougall (2016). These key areas are psychosocial processes (social cohesion, feeling safe), health behaviours (physical exercise, healthy eating opportunities, access to gambling and substances of abuse), and access to resources (work opportunities, safe drinking water, medical care, suitable housing). All these environmental factors impact our ability to maintain good health in various interconnected ways (Donkin et

al., 2018; Keleher & MacDougall, 2016; Marmot et al., 2008). In general, the presence or absence of just one of these resources may have only a small effect on the well-being of otherwise well-resourced residents (Keleher & MacDougall, 2016). The effects, however, are accumulative, and the more of these available in an area to an adequate standard, the greater the likelihood of residents being equipped to take care of their health needs; likewise, the more of these that are absent or inadequate, the more likely well-being will suffer.

Person-environment fit is one theory that provides a framework for relationships between the neighbourhood and well-being. The theory's basic premise is that when the fit between the person and their environment is suboptimal, the result is stress, called 'environmental press' in the context of environment-person fit (Byrnes et al., 2006; Wahl et al., 2012). Of particular interest is that even objectively desirable environmental conditions can cause environmental stress if they do not meet the person's needs (Wahl et al., 2012; Wahl & Gerstorf, 2020). In this way, the fit is theorised as contextual and relies upon how the person experiences the environment rather than the mere presence or absence of environmental features. As functional ability decreases, the importance of the neighbourhood is said to increase (Wahl & Gerstorf, 2020). Despite this, many older adults prefer to age in place, signalling that social belonging is important to older adults (Byrnes et al., 2006; Oswald et al., 2007).

The research so far has been supportive of a relationship between the built environment and well-being, although much of the research in older adults has focussed on physical health and health behaviours (Moore et al., 2018; Peters et al., 2020), such as walking as a means of physical activity (see Borst et al., 2008; Foster et al., 2011; Owen et al., 2004; Winters et al., 2015; Zandieh et al., 2016). However, the literature presents a multifaceted and complex relationship (Domènech-Abella et al., 2019; Donkin et al., 2018; Kearns et al., 2015; Marmot et al., 2008; Rémillard-Boilard et al., 2021). For example, urbanisation is associated with social exclusion and the threat of violence, with urban neighbourhoods experiencing greater concentrations of both violence and crime (Marmot et al., 2008). However, Kowitt et al. (2020) and Singh and Siahpush (2014) suggest that rural living older adults may be at a greater risk than urban living older adults due to the sparseness of rural living, proving a barrier to accessing resources and social networks.

These effects may be exaggerated in older adults already experiencing changes in their mobility and social networks. Winters et al. (2015) found that when provided with covetable destinations and highly walkable neighbourhoods, older adults are very mobile and frequently chose active modes of transport. We do know that these covetable destinations may be different in older adults than for younger cohorts; for example, Winter et al. (2015) found that grocery stores, other houses, malls, and markets were popular destinations for older adults, many of which are found in higher concentrations in urban areas.

Assessing the Physical Environment

While there has been an increased interest in the relationship between older adults and the physical environment, few assessment tools are available to assess the environment with specific regard to the needs of older adults (Mercader-Moyano et al., 2020). Broadly speaking, there are two assessment categories for the neighbourhood environment, objective measures and subjective measures. Subjective measures of the neighbourhood tend to focus on the social features of the environment that are less tangible to the eye(Peters et al., 2020). On the other hand, objective measures of the neighbourhood typically involve the quantification of structural or physical features seen within a predetermined boundary (Peters et al., 2020).

Typical items of interest in subjective measures of the physical environment have been social cohesion (Chu et al., 2004; Domènech-Abella et al., 2019; Gan et al., 2021; Kearns et al., 2015; Kowitt et al., 2020); feelings of safety (Chu et al., 2004; Gyasi et al., 2019; Kearns et al., 2015; Kowitt et al., 2020; Scharf & de Jong Gierveld, 2008); feeling lonely (Chu et al., 2004; Domènech-Abella et al., 2017, 2019; Gan et al., 2021; Kearns et al., 2015; Kowitt et al., 2020; Scharf & de Jong Gierveld, 2008); walkability/perceived access to physical health resources (Domènech-Abella et al., 2019; Kearns et al., 2015; Kowitt et al., 2020); usability/usage of amenities (Domènech-Abella et al., 2019; Gyasi et al., 2019; Kearns et al., 2015); and perceived neighbourhood quality (Domènech-Abella et al., 2019; Kearns et al., 2015; Scharf & de Jong Gierveld, 2008).

While participant perception of the neighbourhood is undoubtedly important (Scharf & de Jong Gierveld, 2008), perhaps even more important than the alternative, we shouldn't assume these perceptions are simply an objective representation of the environment itself. Black and Jester (2020), recognising a gap in the research, set out to examine correlations

between older adult's health status and their perspectives on the built environment. They found that older adults perspectives varied greatly depending on several factors: self-reported health, age, income, and housing accessibility. Older adults who reported higher physical health, mental health and resiliency were less concerned about housing and transport; those with more house adaptations were particularly concerned with transport while having a higher income was negatively associated. This indicates that the physical environment is perceived differently by older adults with lower well-being. Further evidence can be found in Domènech-Abella et al (2019), whose study found that the positive effects of high built environment usability on loneliness were only found in participants without depression. However, for participants with depression, high walkability was more strongly associated with positive outcomes on loneliness measures. Byrnes et al. (2006) found that people with higher physical health needs and poorer mental health reported lower neighbourhood satisfaction than those with fewer physical needs or those reporting better mental health.

Social Determinants of Health and Aging Well

While medical advances continue to improve treatment options, it cannot be ignored that the number of people developing avoidable illnesses is increasing (Baum, 2017; Parker & Fleming, 2002). Relatively recent, though, the Social Model of Health, which acknowledges other determinants of well-being and quality of life such as social factors, has been gaining traction and recognition in the western world (Hogan, 2019). Under the lens of the Medical Model, ageing well has often been viewed as an intrinsic ability of the individual, that is to say, that an individual's capacity to age well lies within their mind and body and reflects their own actions (Hogan, 2019). Increasingly though, policymakers and practitioners within the health and allied health fields recognise the impact of social, political, environmental factors on population and individual health (Donkin et al., 2018; Van Dyck et al., 2015). As much as 45-60% of health inequality is now thought to be attributable to what have been termed 'social determinants of health' (Donkin et al., 2018). In recognising these social determinants, the social model of health represents a movement away from proximal or intrinsic health factors to those more distal or extrinsic in nature (Donkin et al., 2018; Marmot et al., 2008).

Several social determinants have contributed to the well-being of the population; socio-economic status, social discrimination/stigma/rejection, access to good nutrition, adequate housing, education and employment opportunities, and the physical environment are frequently cited in the literature (Donkin et al., 2018; World Health Organization, 2020a). These elements often have multi-directional relationships with one another and a person's health. They are known to have both direct and moderating effects on well-being whilst being intercorrelated with each other (Lowry et al., 1996). For instance, people with chronic conditions generally have lower socio-economic stability due to earning capacity and increased medical costs, which may decrease social participation, therefore, increasing loneliness (Donnelly, 2012). The increased loneliness may progress to a more pervasive feeling of depression or anxiety, or it may simply lead to a stress response causing hypertension, digestive disruptions, and in the long term, reduced immunity (Jaremka et al., 2013). While these social determinants can influence well-being at any age, including in utero, they are thought to be accumulative across the entire lifespan, placing older adults at an increased risk than their younger counterparts (Evans et al., 2021).

Ageing Well and Socioeconomic Status

Socioeconomic status is one of the most influential external factors when considering wellness at any age despite having very little to no direct influence on health (Donahoe & McGuire, 2020). Rather socioeconomic status moderates health inequality because the availability of economic resources greatly impacts access to health-promoting nutrition, medical care, preventative health practices, stable housing, heating, education, and greatly reduces the chronic stress associated with the absence of these things (Domènech-Abella et al., 2017; Donahoe & McGuire, 2020). Many studies have found solid relationships between socioeconomic status and health, including Lowry et al. (1996), who found that chronic illness risk factor behaviour in US teens was inversely related to their socioeconomic status. In addition, Donkin et al. (2017) cite a 20-year life expectancy gap between males living in the richest and poorest areas of Glasgow, Scotland, with similar trends noted in Washington DC and Baltimore in the United States of America.

Ageing Well and Social Participation

While there is more to loneliness than just social participation, the more involved one is in social activity and events, the more likely they will successfully fulfil their social needs (Hawkley et al., 2008). Older adults tend to face a reduction in certain social interactions, which increase as they age. This drop appears to coincide with lifestyle and life stage changes such as retirement, the death of partners and friends, family moving further afield, and changing social roles (Dykstra, 2009). Participation is so important that it is a key focus and measure of outcome in rehabilitation (World Health Organization, 2002). The International Classification of Functioning, Disability, and Health (ICF) is a framework presented by WHO that takes a person's level of functioning as a sum of Body Functions and Structures, Activity, and Participation (World Health Organization, 2002).

Ageing Well and Chronic Conditions

Studies and national data show that living with a chronic health condition increases inequitable access to resources across the lifespan (Chiaranai et al., 2018; Crook & Peters, 2008; Hefford et al., 2005). For instance, people with a chronic condition typically earn less than their 'healthy' counterparts and have increased healthcare costs (Hefford et al., 2005). They may also experience greater barriers to access resources, face increased social stigma or isolation, are at greater risk of harm from others, and depending on the illness, face vast differences in the standard of care and funding for live preserving measures (Chiaranai et al., 2018; Crook & Peters, 2008). They may also require greater support later in life as the condition advances or becomes compounded with other age-related physical or cognitive abilities (Chiaranai et al., 2018; Shamshirgaran et al., 2020).

The Current Study

The current study has two main purposes; the first is to establish the extent of the relationship between objective measures of the residential environment and participants subjective reports of neighbourhood quality. The second is to explore the correlation between the residential environment and the mental well-being of older adults as indicated by the endorsement of symptoms of loneliness, depression, and anxiety.

Research Question 1: What are the relationships between the objective measures of the environment and participants' subjective assessments of their environment.

Although the evidence from other studies cautions against the assumption of a direct correlation, we expect some level of correlation between objective and subjective measures of the same environment. Establishing this relationship is particularly important to this study as this will be the first study using an objective measure of the environment relevant to older people in New Zealand. Establishing a positive correlation between the two will contribute to understanding the role of the OPERAT for use in New Zealand neighbourhoods.

Suppose previous theories about the protective factors of a positive physical environment are accurate. In that case, we expect to see those who live in the more desirable neighbourhoods, as identified in both our subjective and objective assessments, reporting fewer feelings of loneliness, depression, or anxiety. Our current study's task is to determine if this relationship remains both when the physical environment is more objectively defined and when the neighbourhood is assessed using the residents' subjective perceptions.

Hypothesis 1: Those participants who live in more desirable neighbourhoods will report lower loneliness, depression, and anxiety.

Because we know that the social determinants of health share complex relationships, we will account for three proposed as most closely associated with our target variables; socioeconomic status, social participation, and chronic conditions. The expected relationship should prevail after accounting for these confounders. Figure 1 depicts the proposed relationship between the physical environment and well-being as measured by Loneliness, Anxiety, and Depression.

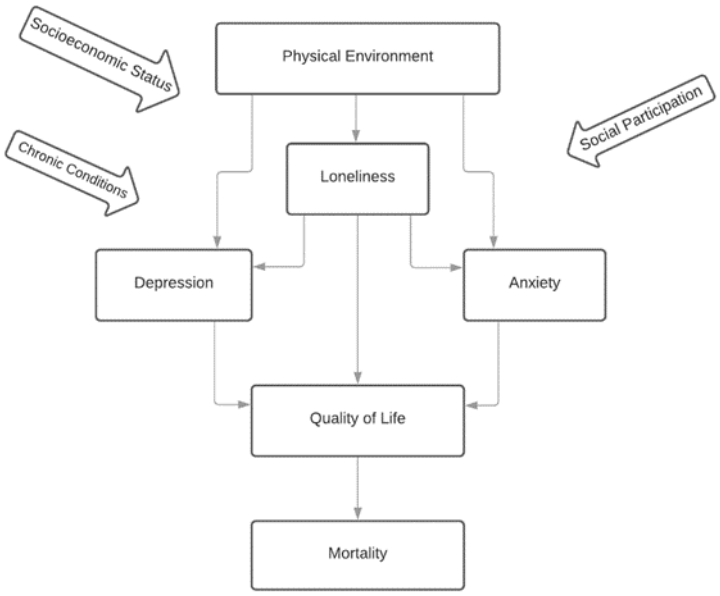

Figure 1*: The proposed relationship between the Physical Environment and Well-being as measured by Loneliness, Anxiety and Depression. Socioeconomic status, Chronic Conditions, and Social Participation are proposed as extraneous variables due to their known relationships with Well-being.*

Materials and Methods

This study was conducted in two separate modes of data collection, the first being a postal survey, part of the ongoing Health, Work, and Retirement study. The second part of the study involved the physical assessment of neighbourhoods. These are detailed separately below.

Data Collection 1

Participants

Participants for this study were identified from an existing nationwide longitudinal study, The New Zealand Health, Work, and Retirement Survey, a Biennial survey led by the Health and Ageing Research Team at Massey University. The data for this study is drawn from the 2020 participant cohort of the New Zealand Health, work, and Retirement Study, which consisted of 4351 participants aged 55-92 with a mean age of 66.83, *SD* =7.3. Made up of 2468 females (56.7%) and 1885 (43.3%) male, no participants identified themselves as gender diverse.

The 2020 Survey participants were made up of two cohorts, an existing cohort of participants from previous survey iterations (2006-2018) and a refresh cohort. Potential participants for the refresh cohort were identified from the New Zealand electoral roll as born between 30/10/1954 and 29/10/1965 and, therefore, aged 55-65 at the time of the survey. As identified in the original 2006 sampling protocol, an oversampling of participants of Māori descent (as identified by electoral roll) was desired, with a goal of a 1:1 sampling bias. All other participants were selected from within the general electoral roll. People residing overseas (n = 9742, 1.55%) and those who had already responded to the survey were excluded from the sample.

Based on desired numbers for representative sampling (n= 533 Māori, n= 533 general) and past response rates, a Māori descent sample of n = 2011 persons and a general sample of n = 1541 persons were invited to the 2020 refresh cohort. Response rates for new Māori invitees were 20% (n= 403), and the response rate for new general invitees was 30.4% (n= 468), giving a total refresh cohort of 871 participants. The refresh invitees combined with returning participant invitees from previous cohorts (n= 4614) meant 8166

participants were invited to the 2020 survey. Overall response rates for all invites to the 2020 Health, Work, and Retirement survey was 53.3%.

Measures

Sociodemographic Characteristics. Age and sex were included as personal characteristics. Age was considered a continuous variable ranging from 55 to 92 years (mean = 66.83 years). Sex was treated as a dichotomous variable (1 = male; 2= female, 3= Gender Diverse).

Loneliness. The 6-item De Jong Gierveld Loneliness scale was used to measure loneliness in participants. The 6-item test is an empirically valid and reliable self-administered measure of emotional, social loneliness, and overall loneliness (de Jong Gierveld & van Tilburg, 2010b; Penning Margaret J. et al., 2014). Reliability of the 6-item version is shown with Cronbach's α coefficients between .70 and .76 for the full scale for the total adult population (de Jong Gierveld & van Tilburg, 2006).

The 6-item assessment is taken from the longer original De Jong Gierveld Loneliness Scale, which consists of 11 items in response to concerns regarding the usability of the longer scale in large scale studies. Van Tilburg and de Leeuw (1991) analysed the robustness of the 11-Item scale across different administration methods (including face-to-face interviews, telephone, and self-administration). Overall, they found the scale robust in personal scalability and scale homogeneity but noted that participants displayed higher self-disclosure in the absence of an administrator and consequently had higher scale scores.

The De Jong Gierveld Loneliness Scale contains three positive effect statements (e.g. "There are plenty of people I can rely on when I have problems"), which make up the Social Scale and three negative effect statements (e.g. "I experience a general sense of emptiness") which make up the Emotional Scale. The items are scored on a 3-point Likert scale of "yes", "more or less", and "no". Negative and neutral responses to the social scale ("no" and "more or less") are scored 1 point each for the social scale, and "yes" responses are scored 0. The emotional scale is scored 1 point for each "yes" or "more or less" response and 0 for "no" responses. The overall Loneliness score is calculated by simply summing the social and emotional subscale scores. A scaled score of 2 or more indicates Loneliness on a secondary dichotomous scale of "lonely" "not lonely", this dichotomous scale was used for

preliminary analyses, but all correlations were calculated using continuous scale scores. The possible range is 0-6.

Depression. Depressive symptomology was assessed using the short form of the Centre for Epidemiological Studies Depression Scale (CES-D-10). The CES-D-10 is a widely used assessment tool for detecting depression in large scale studies with well-established validity and reliability (Mohebbi et al., 2018). For example, Andresen et al. (1994) found the CES-D-10 showed a positive correlation with poorer health status scores (r = .37), a strong negative correlation with positive affect (r = —.63), and retest correlations comparable to those in other studies (r = .71). In a more recent study of 19,114 Australian and USA participants, Mohebbi et al. (2018) found the CES-D-10 to have a reliability coefficient of α= 0.70 while our study found similar reliability of α= 0.72.

The CES-D-10 contains eight negative affect statements and two positive affect statements, which participants score on a 4-point Likert scale of "*rarely or none of the time"* (score of 0) to *"all of the time"* (score of 3). The two positive affect statements are reverse scored. Possible scores range from 0-30, with a higher score indicating more severe symptomology. A dichotomous score of "Depressed", "Not Depressed" is also calculated using a scale score of 13 as the cut-off point indicating the presence of depression. Dichotomous scores were used for preliminary frequencies checking, but all calculations used the original continuous scale score.

Anxiety. Anxiety was measured using the Geriatric Anxiety Inventory- Short Form (GAI-SF), a 5-item self-administered assessment designed specifically for participants aged 60 and over (Byrne & Pachana, 2011). The GAI-SF is an abbreviated form of the original GAI, which had 20 items and with which it shares high correlation (ρ = 0.88) (Byrne & Pachana, 2011; Johnco et al., 2015). While the full GAI is recommended for use in clinical settings, the GAI-SF was developed for and showed aptitude as a screening tool and for large scale epidemiological studies (Byrne & Pachana, 2011). Byrne and Pachana (2011) found the GAI-SF to have good internal consistency (α = 0.81) and to be correlated with the state scale of the State-Trait Anxiety Inventory (α = 0.48) but not correlated to age, education, MMSE score, or perceived income adequacy. Our study found the GAI-SF to be reliable, with an alpha of .81

The GAI-SF contains five negative affect statements with “yes”/ “no” responses. Participants score one point for each statement they endorse for a total possible score ranging from 0-5. Typically, a score of 3 or higher would indicate a positive screening for generalised anxiety and warrant further investigation. The standard cutoff score was used to calculate the prevalence of Anxiety within the population; however, no cut-off was required beyond that. Scale scores indicated severity, where greater numbers of symptom endorsements were presumed to represent higher anxiety levels.

Socioeconomic Status. Socioeconomic status was assessed using the Economic Living Standard Index Short Form (ELSI-SF). As assessed by coefficient alpha, reliability is .88 for the ELSI-SF, representing great internal consistency (Jensen et al., 2005); our data returned a coefficient alpha of .83. The scale consists of 25 items designed to assess economic well-being across three areas, ownership restrictions (e.g. “For the following questions, please indicate whether or not you have (or have access to) the item:”), social participation restrictions (e.g. “Have a night out for entertainment or socialising at least once a fortnight”), and economising (e.g. “Gone without or cut back on fresh fruit and vegetables to help keep down costs”).

The ELSI-SF employs several response sets across the scale ranging from a 5-point Likert scale (ranging High to low) to a 3-point Likert scale (“not at all”, “a little”, and “a lot”). The assessment produces several outputs; A continuous scale score that has a possible range of 0-31 with lower scores indicating greater levels of hardship and an ordinal scale which translates the continual scale scores into levels of hardship with scores of 0-16 indicating hardship, scores of 17-24 are considered ‘comfortable’, and 25-31 indicate good financial living standards.

Social Participation. Participants were asked to indicate whether they belonged to a series of organisations; this required a “yes” or “no” response. The options were Sports clubs; Community or service organisations that help people; Political party, or professional association, or business organisation; A trade union Religious, church, or other spiritual organisation; Hobby, leisure time, or arts association/group; Group that supports cultural traditions, knowledge or arts; and any other, club, lodge or similar organisation. Participants scored 1 point for each participatory activity they belonged to and scored 0 for all negative responses resulting in a continuous scale score with a possible range of 0 to 8.

Chronic conditions and Illness. Participants were asked to identify illnesses that a Health Professional had diagnosed; options for each condition were “never”, “Yes, in the last 12 months”, or “Yes, prior to 12 months”. Conditions included Arthritis or rheumatism, Disorder of the neck or back. (e.g. lumbago, sciatica, chronic back or neck pain, vertebrae or disc problems); Diabetes; A disability; Heart trouble (e.g., angina or heart attack); High blood pressure or hypertension; Depression; Other mental illness; Respiratory condition (e.g., bronchitis, asthma); Sleep disorder; Stroke; Active or chronic gout; Active/chronic hepatitis, cirrhosis or other liver condition; Cancer (e.g. lung, leukaemia, melanoma); or other illness. Any positive indication of the condition existing (prior to or within the last 12 months) was scored a 1, and all “no” responses were coded 0. Conditions were tallied for each participant to produce a single continuous scale score.

During the first wave of analysis, it was discovered that 1976 (45% of participants) Chronic conditions scores were missing in the system. On investigation, many surveys had no response to one or more of the items in the scale despite other items being responded to, leading to a missing scale score. Consequently, all missing data within the items were recoded to 0, and the scale score recalculated. Frequencies were rechecked to ensure the data showed similar trends after the recode. Although the same basic trend was still visible in the data, those with no conditions rose from 7.9% to 12.8%; the largest increases occurred between 1 and 4 chronic conditions present, consistent with the population distribution before the missing data was recoded.

The original questionnaire consisted of 15 chronic conditions choices; we removed two of these conditions from the scale for this study (depression and other mental illnesses) due to these being tested separately (CES-D and GAI). This left 13 items in the Chronic Conditions scale, giving a possible range of 0 to 13.

Perceived Neighbourhood Qualities. Perceived neighbourhood qualities were measured using 14 items taken from 2 Neighbourhood studies (Neighbourhood Social Cohesion (Stafford et al., 2003), the Housing Options for Older People tool (Elderly Accommodation Counsel, 2021), and the ENABLE-AGE Survey Study (Oswald et al., 2006)) designed to measure the participant's subjective experience of their neighbourhood and its qualities. Twelve of these items were positive affect items, with the remaining two being negatively oriented. The item responses were on a 5-point Likert scale with a response scale

ranging from “no, definitely not” (1 point) to “yes, definitely” (5 points). The two negative affect items were reverse-scored so that a “no, definitely not” response was scored 5 through to 1 point awarded for a “yes, definitely” response.

A Neighbourhood Quality score was calculated by summing the scores of each item; the scale had a possible range of 14- 70, with higher scores representing higher perceived neighbourhood quality. Scale reliability for Neighbourhood Quality was calculated using Cronbach’s alpha; the scale demonstrated excellent reliability at .84. The 14 items were grouped into four subscales based on the meaning of the item content. The resulting subscales were neighbourhood Trust, Neighbourhood Facilities, Neighbourhood Safety, and Neighbourhood Satisfaction.

Neighbourhood Trust was assessed using the trust subscale of the Neighbourhood Social Cohesion tool proposed by Stafford and colleagues (2003). The subscale contains six items designed to measure neighbourhood trust (e.g. “In this area people would stop children if they saw them vandalising things”), four are positive affect statements, and two are negative affect statements. The scale score is calculated by summing the item scores giving a possible scale range of 6-30. Although the original study found the scale reliable with a Cronbach’s alpha of 0.73, our calculations returned an alpha of 0.83.

Neighbourhood Facilities consisted of three items taken from the Housing Options for Older People tool (Elderly Accommodation Counsel, 2021) and were selected due to identification as important factors by Buckenberger (2012). The items included in the scale are “I can get to the shops easily”, “I am close enough to any help I need”, and “I am close enough to important facilities”. The scores of each item were summed to give a score with a possible range of 3-15. The neighbourhood facilities subscale returned a Cronbach’s alpha of 0.86, indicating excellent reliability.

The four items that make up the Neighbourhood Safety subscale were also taken from the Housing Options for Older People tool (Elderly Accommodation Counsel, 2021) and related to areas Buckenberger (2012) identified as important neighbourhood factors. Cronbach’s alpha was calculated to be .76. The items in this scale include “I feel safe in my neighbourhood”. The subscale had a possible score range of 4-20 and was calculated by summing the item scores.

Neighbourhood Satisfaction consisted of a single item, “I am satisfied with my neighbourhood”. This item is adapted from Oswald (2006), who used a similar question structure to assess a single item subscale for housing satisfaction. The subscale score in this instance was the item score, so it had a possible range of 1-5.

Procedures

The 2020 New Zealand Health, Work, and Retirement Survey, a 36-page postal survey, was sent to persons who had participated previously in the survey between 2006-2018 (‘existing’ cohort), as well as the new sample invited to participate in the study for the first time (2020 ‘refresh’ cohort). The survey, along with an introductory letter, information sheet, pen, consent form and reply-paid return envelope, was sent to prospective participants on 11th June 2020. A digital copy of initial materials sent to participants is provided in Appendix A.

A first reminder was sent three weeks later (7th July 2020), comprised of a postcard thanking persons who had returned the survey and asking those who had not to do so. A second reminder was sent to those who had not returned the survey (or otherwise notified as being lost to contact, deceased, or withdrawn) after 12 weeks from the initial contact (17th September 2020); this comprised of a final reminder letter, information sheet, a replacement survey booklet, consent form and a reply-paid return envelope.

Data Collection 2

Participants

The second participant group was identified from within the New Zealand Health, Work, and Retirement sample. Of those 4351 participants, we obtained the OPERAT Neighbourhood scores of 60. This participant subgroup consisted of 38 males (63.3%) and 22 females (36.7%). The participants were aged 55-82 with a mean age of 66.6 years old, *SD*= 6.5.

Measures

Physical environment. The tool used to obtain Neighbourhood scores, the Older Persons External Residential Assessment Tool (OPERAT), focuses on the physical environment of the residential neighbourhood at the meshblock level and doesn’t account for amenities and facilities so much as the general tidiness and presentation of the

neighbourhood (Burholt et al., 2016). Meshblocks are predefined, contiguous areas of varying size which cover the entire country and 200km of water surrounding our islands and represent “the smallest geographic unit for which statistical data is reported by Statistics NZ” (Statistics New Zealand, 2016, p. 5). Meshblock sizes vary greatly both geographically, from a single block in cities to large expansive areas covering several square kilometres in rural areas (Statistics New Zealand, 2016)(a map of New Zealand meshblock boundaries can be viewed at https://datafinder.stats.govt.nz/layer/27774-meshblock-2017-generalised-version/), and the number of households per meshblock, with the 2013 census data on privately occupied dwellings per meshblock ranging from 3 to 630 (Statistics New Zealand, 2014).

This approach differs from some studies in the field that have focused on much broader and less distinct neighbourhood boundaries, including postcodes, entire townships, and cities (see (Gyasi et al., 2019; Scharf & de Jong Gierveld, 2008)). Assessment takes place on two levels, the first being each residence in the meshblock (i.e. assessing the external state of property maintenance) and the second being the general state of the neighbourhood at the street level as a whole (i.e., footpaths, littering, graffiti, public transport, and maintenance.). The OPERAT represents one of the few objective tools for assessing the physical environment designed specifically to encompass the aspects of a neighbourhood most important to older adults (Burholt et al., 2016).

The development and validity measures of the tool are covered extensively in Burholt et al. (2016). In summary, however, the OPERAT represents a valid and reliable tool for assessing the physical environment concerning the needs of older adults aged 65+. Spearman’s rank correlations of ≥0.2 between any item and the item-domain total score were met to justify inclusion in the tool. Convergent Validity, the extent to which the items measured the neighbourhood environment, was estimated using Spearman’s Rank correlations for each factor domain and older adult's perception of their neighbourhood. Several weak but statistically significant correlations were found, indicating that the domain items correspond weakly with participants subjective experience of their neighbourhood. However, inter-rater agreement was strong, with Krippendorf’s Alpha scores of ≥0.80 suggesting the items have a clear and specific objective basis for assessment, making it ideal for use in broad-scale studies with multiple assessors.

The OPERAT provides five scores for each assessed Meshblock, four separate factor scores: Natural Elements (Scale score range 0-20), Incivilities and Nuisances (scale score range 0-20), Navigation and Mobility (scale score range 0-40), and Territorial Functioning (scale score range 0-20) and a Global Weighted score (range 0-100). The OPERAT is scored so that a lower score represents greater neighbourhood desirability, while higher scores indicate lower neighbourhood desirability.

The Natural Elements domain contains items about the presence or absence of public grass or verges, sounds of nature, and trees in gardens. Incivilities and Nuisances were calculated by observing the industrial or other offensive noises; incidences of litter, dog fouling and broken glass; and the number of vehicles passing during the assessment. Navigation and mobility were related to the condition of the roads and pavements, street lighting, the gradient of the land, and road signage. The final domain, Territorial Functioning, was assessed on both the property and street level, identifying external house and garden maintenance and decoration, the nature of parking, and the neighbourhood outlook. A sample OPERAT assessment sheet is included in appendix B.

Procedures

Assessors received training resources for the OPERAT and undertook a test assessment concurrent with a senior researcher to ensure inter-rater validity and understanding of the assessment. After initially selecting local meshblocks at random, anonymised meshblock codes were provided for New Zealand Health, Work, and Retirement study participants. Several assessors undertook OPERAT assessments for the study based on the geographical location of residence.

Residential assessments took place between December 2020 to March 2021 within the restrictions of Covid-19 social distancing and isolation policies. Assessment areas were Auckland City, Wellington, Kāpiti Coast, Horowhenua, Hastings, Nelson, and Dunedin. Raw assessment data for each meshblock was collated and input into the OPERAT NZ database (https://www.operat.co.nz/) which calculates the five assessment scores.

Ethics and Funding

This project was reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application – 20/07; Health, Work and Retirement Study 2020

The New Zealand Health, Work and Retirement survey receives funding from the Ministry of Business, Innovation and Employment (MAUX1705).

Analysis

All statistical analyses were computed using IBM SPSS version 27 software. The first wave of analyses was to calculate basic frequencies and descriptive data for all measures. The second wave of analyses was to calculate validity for the Neighbourhood quality subscales. Next, bivariate correlations were calculated between key variables using Pearson's Correlation Coefficient.

The third wave of analysis was to run three hierarchical multiple regression analyses with each of the Well-being Variables, Loneliness, Depression, and Anxiety as the dependant variable. Here, we employed a 3-step equation, first controlling for Socioeconomic Status, then Social Participation and Chronic Conditions in the second step, followed by Neighbourhood Trust, Neighbourhood Safety, Neighbourhood Facilities, and Neighbourhood Satisfaction in the third and final step. Again, all multivariate assumptions of linearity, normality, multicollinearity, and homoscedasticity were met for each regression analysis.

Results

Descriptive Statistics

Overall, scores represented the breadth of the variable scales with minimum and maximum scores at the lower and upper limits of the possible scale ranges (Table 1), the exception to this was the OPERAT scale in which the observed range of 5.86- 75.86 was positively skewed on the 0- 100 possible range. Looking at the prevalence of Loneliness, 1754 participants (40.3%) screened positive with a cut-off score of 2. Using the standard CES-D 10 cut off score of 13, 22.6% (982) of participants screened positive for Depression. Positive screens for anxiety were found in 15.9% of the participants using the standard cut-off of 3. The majority, 87.2%, of our participants lived with at least one chronic condition; 7.1% indicated they lived with six or more conditions. Social Participation was overall quite low, 22.7% engaged in none of the participation activities while a further 22.7% engaged in only 1. Our study participants were positively skewed on Socioeconomic Status scales, with only 15.5% falling into one of the three hardship categories (Severe Hardship, 2.4%; Significant Hardship, 2.4%; and Some Hardship, 10.7%).

Research Question 1

The OPERAT (full scale) shared moderate and significant correlations with the subscales Neighbourhood Trust (r= -.32, p< .05) and Neighbourhood Safety (r= -.38, p< .01).

OPERAT subscale Natural Elements strongly correlated with participants' perceptions of Neighbourhood Quality and its subscales with 4 of the 5 correlations meeting statistical significance. Moderate correlations were found with Neighbourhood Quality (full scale) (r= -.46, p< .01), Neighbourhood Trust (r= -.36, p< .01), Neighbourhood Satisfaction (r= -.34, p< .01), and Neighbourhood Safety (r= -.41, p< .01).

The Incivilities and Nuisance OPERAT subscale shared a moderate and statistically significant correlation with Neighbourhood Safety (r= -.32, p< .05), but there were no significant correlations with any other measures of Neighbourhood Quality. Navigation and Mobility shared a weak but statistically significant relationship with overall Neighbourhood Quality (r= -.28, p< .05). The OPERAT Territorial Functioning score had a moderate and significant correlation with Neighbourhood Safety (r= -.32, p< .05).

Hypothesis 1

Bivariate Correlations

Coefficient matrices were created to assess the correlations between the OPERAT and Loneliness, Depression and Anxiety (Table 3) and subjective measures of Neighbourhood Quality and the well-being variables (Table 4), respectively. Analyses found no statistically significant relationships between the neighbourhood as measured by the OPERAT or its domains and Loneliness, Depression, or Anxiety. However, two statistically significant relationships with moderate effect sizes were found between perceived Neighbourhood Quality and Loneliness. Those correlations were between Neighbourhood Facilities and both Loneliness (r= -.32, p <.05) and Social Loneliness (r= -.31, p < .05).

Table 1 Descriptive Statistics for All Study Variables

Variable	N	Possible range	Minimum	Maximum	Mean	Std. Deviation
OPERAT	60	0- 100	5.86	75.86	33.7	18.9
Natural Elements	60	0- 20	0.00	16.67	4.7	4.9
Incivilities and Nuisance	60	0- 20	0.00	20	8.9	6.4
Navigation and Mobility	60	0- 40	0.00	36.92	11.3	10.6
Territorial Functioning	60	0- 20	2.14	20	8.7	3.4
Neighbourhood Quality	4118	14- 70	16	70	61.9	7.4
Neighbourhood Trust	4205	6- 30	6	30	25.0	4.1
Neighbourhood Safety	4264	4- 20	4	20	18.7	2.4
Neighbourhood Facilities	4250	3- 15	3	15	13.7	2.2
Neighbourhood Satisfaction	4301	1- 5	1	5	4.5	0.8
Loneliness	4268	0- 6	0	6	1.6	1.7
Depression	4286	0- 30	0	29	6.3	4.9
Anxiety	4236	0- 5	0	5	0.9	1.5
Socioeconomic Status	3903	0- 31	0	31	24.9	5.9
Social Participation	3849	0- 8	0	8	1.6	1.4
Chronic Conditions	4351	0- 13	0	12	2.5	1.9
Age	4351	55+	55	92	66.8	7.3

To further test the hypothesis that participants who live in more desirable neighbourhoods will report lower levels of loneliness, depression, and anxiety, the third wave of correlations were run with the entire participant population of the New Zealand Health, Work and Retirement study (*N*= 3642). Again, we looked at perceived Neighbourhood Quality, Loneliness, Depression, and Anxiety but with the addition of Socioeconomic Status, Social Participation, and Chronic Conditions. Intercorrelations between all 14 variables, shown in Table 5, were significant except between Age and Depression.

With regards to the hypothesis, the overall trend shown is that Neighbourhood Quality shares statistically significant correlations of moderate effect size with Loneliness (*r*= -.42, *p* <.01), Depression (*r*= -.40, *p* <.01), and Anxiety (*r*= -.24, *p* <.01). Furthermore, Neighbourhood Quality subscales reflect the same general trend with the strongest effect sizes seen between Neighbourhood Trust and Loneliness and Neighbourhood Safety and Depression (both *r*=-.35, *p* <.01) and the weakest between Neighbourhood Facilities and Anxiety (*r*= -.15, *p* <.01).

Socioeconomic Status was moderately associated with Neighbourhood Quality (*r*= .45, *p* <.01) and all its subscales as well as with Loneliness (*r*= -.38, *p* <.01), Depression (*r*= -.45, *p* <.01), and Anxiety (*r*= -.30, *p* <.01). Age had low positive correlations with perceptions of Neighbourhood Quality and weak negative correlations with Loneliness and Anxiety. Chronic conditions had weak negative correlations with Perceived Neighbourhood Quality, weak positive correlations with Loneliness and Anxiety, but a moderate positive correlation with Depression (*r*= .32, *p* <.01). Social Participation had weak correlations with all variables; positive relationships were identified with Neighbourhood Quality and its subscales, whilst negative relationships were found with Well-being.

Multiple Regression Analysis

1. *Loneliness as the Dependent Variable*

At Step 1 of the hierarchical multiple regression analysis, Socioeconomic Status accounted for 15% of the variance in Loneliness scores, R^2= .15, $F(1, 3381) = 617.09$, $p <$ .001. At Step 2, Social Participation and Chronic Conditions were added to the regression

equation and accounted for an additional significant 1% of the variance in Loneliness, R^2 = .16, $F(3, 3379) = 212.48$, $p < .001$. At Step 3, the neighbourhood perception subscales were added to the equation accounting for an additional 7% of the variance in Loneliness, $R^2 = .23$, $F(7, 3375) = 146.04$, $p < .001$. A summary of these results can be found in Table 6.

After controlling for Socioeconomic Status, Social Participation, and Chronic Conditions, perceptions of Neighbourhood Satisfaction, Trust, Safety, and Facilities, are significantly related to Loneliness, though the strength of those correlations decreases. Neighbourhood Trust returned the strongest correlation with a β coefficient of -.15, $p < .001$, Neighbourhood Safety β= -.06, $p < .001$, Neighbourhood Facilities β= -.11, $p < .001$, and Neighbourhood Satisfaction β= -.08, $p < .001$.

2. *Depression as the Dependent Variable*

The same independent variables were entered to assess their effect on Depression. At step 1 Socioeconomic Status accounted for 21% of the variance in scores, $R^2 = .21$, $F(1, 3357) = 893.94$, $p < .001$. Social Participation and Chronic Conditions accounted for 4% of the variance when added at step 2, $R^2 = .25$, $F(3, 3355) = 374.13$, $p < .001$.

At the third step in the multiple regression analysis, Neighbourhood Trust, Neighbourhood Safety, Neighbourhood Facilities, and Neighbourhood Satisfaction accounted for a further 5% of the variance in Depression, $R^2 = .30$, $F(7, 3351) = 203.11$, $p < .001$. These results are summarised in Table 7.

Again, Neighbourhood Trust retained the strongest correlation to depression (β= -.11, $p < .001$), Neighbourhood Safety and Facilities maintained weaker correlations, both β= -.09, $p < .001$. Neighbourhood satisfaction was not significantly related to Depression.

3. *Anxiety as the Dependent Variable*

The third regression analysis found Socioeconomic Status to account for 9% of the variance in Anxiety scores at step 1, $R^2 = .09$, $F(1, 3335) = 330.21$, $p < .001$. At step 2, taken together, Social Participation and Chronic Conditions accounted for a further 1% of variance, $R^2 = .10$, $F(3, 3333) = 129.09$, $p < .001$. At the 3rd step, Neighbourhood Trust, Neighbourhood Safety, Neighbourhood Facilities, and Neighbourhood Satisfaction accounted for 2% of additional variance in Anxiety.

When assessing the Standardised β coefficients (Table 8), only Neighbourhood Safety retained a significant relationship with Anxiety with a β of -.12, p <.001. Neighbourhood Trust, Neighbourhood Facilities, and Neighbourhood Satisfaction retain no significant relationship to Anxiety following hierarchical multiple regression analysis accounting first for Socioeconomic Status, then Social Participation, and Chronic Conditions.

Table 2 Correlations between OPERAT and Perceived Neighbourhood Quality (n= 60)

	OPERAT	Natural Elements	Incivilities and Nuisance	Navigation and Mobility	Territorial Functioning	Neighbourhood Quality	Neighbourhood Trust	Neighbourhood Safety	Neighbourhood Facilities	Neighbourhood Satisfaction
OPERAT	1.00									
Natural Elements	.65**	1.00								
Incivilities and Nuisance	.75**	.56**	1.00							
Navigation and Mobility	.82**	0.25	.35**	1.00						
Territorial	.67**	.39**	.40**	.45**	1.00					
Neighbourhood Quality	-.40**	-.46**	-0.25	-.28*	-0.24	1.00				
Neighbourhood Trust	-.32*	-.36**	-0.17	-0.23	-0.21	.91**	1.00			
Neighbourhood Safety	-.38**	-.40**	-.32*	-0.20	-.32*	.79**	.58**	1.00		
Neighbourhood Facilities	-0.24	-0.21	-0.13	-0.24	-0.05	.50**	0.24	.26*	1.00	
Neighbourhood Satisfaction	-0.03	-.34**	-0.04	0.10	0.09	0.21	0.13	0.08	-0.08	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3 Correlations between OPERAT and Loneliness, Depression, and Anxiety (n= 60)

	OPERAT	Natural Elements	Incivilities and Nuisance	Navigation and Mobility	Territorial Functioning	Loneliness	Emotional Loneliness	Social Loneliness	Depression	Anxiety
OPERAT	1.00									
Natural Elements	.65**	1.00								
Incivilities and Nuisance	.75**	.56**	1.00							
Navigation and Mobility	.82**	0.25	.35**	1.00						
Territorial Functioning	.67**	.39**	.40**	.45**	1.00					
Loneliness	-0.05	-0.07	0.02	-0.03	-0.14	1.00				
Emotional Loneliness	-0.19	-0.12	-0.10	-0.16	-0.18	.67**	1.00			
Social Loneliness	0.07	-0.01	0.11	0.08	-0.05	.84**	0.16	1.00		
Depression	-0.07	-0.09	0.05	-0.11	-0.04	.37**	.49**	0.14	1.00	
Anxiety	-0.22	-0.17	-0.20	-0.12	-0.21	.28*	.48**	0.02	.65**	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 Correlations between Perceived Neighbourhood Quality and Loneliness, Depression, and Anxiety (n= 60)

	Neighbourhood Quality	Neighbourhood Trust	Neighbourhood Safety	Neighbourhood Facilities	Neighbourhood Satisfaction	Loneliness	Emotional Loneliness	Social Loneliness	Depression	Anxiety
Neighbourhood Quality	1.00									
Neighbourhood Trust	.91**	1.00								
Neighbourhood Safety	.79**	.58**	1.00							
Neighbourhood Facilities	.50**	0.24	.26*	1.00						
Neighbourhood Satisfaction	0.21	0.13	0.08	-0.08	1.00					
Loneliness	-0.16	-0.13	0.02	-.32*	0.11	1.00				
Emotional Loneliness	0.04	0.10	0.11	-0.16	-0.09	.67**	1.00			
Social Loneliness	-0.24	-0.25	-0.06	-.31*	0.21	.84**	0.16	1.00		
Depression	-0.01	-0.01	0.00	-0.06	0.12	.37**	.49**	0.14	1.00	
Anxiety	0.00	0.06	-0.03	-0.18	0.10	.28*	.48**	0.02	.65**	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5 Correlations between Perceived Neighbourhood Quality, Well-being, and Socioeconomic Status, Social Participation, Chronic Conditions, and Age (n= 3642)

	N. Quality	N. Trust	N. Safety	N. Facilities	N. Satisfaction	Loneliness	Emotional Loneliness	Social Loneliness	Depression	Anxiety	SE Status	Social Participation	Chronic Conditions	Age
Neighbourhood Quality	1.00													
Neighbourhood Trust	.87**	1.00												
Neighbourhood Safety	.83**	.56**	1.00											
Neighbourhood Facilities	.60**	.25**	.42**	1.00										
Neighbourhood Satisfaction	.68**	.50**	.64**	.29**	1.00									
Loneliness	-.42**	-.35**	-.34**	-.28**	-.30**	1.00								
Emotional Loneliness	-.34**	-.27**	-.30**	-.23**	-.24**	.76**	1.00							
Social Loneliness	-.35**	-.30**	-.27**	-.23**	-.25**	.87**	.35**	1.00						
Depression	-.40**	-.33**	-.35**	-.26**	-.27**	.55**	.55**	.38**	1.00					
Anxiety	-.24**	-.19**	-.24**	-.15**	-.18**	.39**	.43**	.25**	.57**	1.00				
Socioeconomic Status	.45**	.37**	.41**	.28**	.30**	-.38**	-.36**	-.29**	-.45**	-.30**	1.00			
Social Participation	.09**	.08**	.06**	.05**	.05**	-.08**	-.06**	-.07**	-.09**	-.07**	.08**	1.00		
Chronic Conditions	-.17**	-.13**	-.15**	-.11**	-.09**	.15**	.17**	.10**	.32**	.18**	-.29**	.03*	1.00	
Age	.14**	.12**	.12**	.06**	.13**	-.09**	-.06**	-.09**	-0.03	-.09**	.13**	.11**	.16**	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6 Summary of Hierarchical Regression Analysis for Variables predicting Loneliness (n= 3381)

	Model 1		Model 2		Model 3	
Independent Variables	B	β	B	β	B	β
Socioeconomic Status	-.11***	-.40***	-.11***	-.38***	-.07***	-.24***
Social Participation			-.06***	-.05***	-.05*	-.04*
Chronic Conditions			.04**	.05**	.03*	.03*
Neighbourhood Trust					-.06***	-.15***
Neighbourhood Safety					-.04**	-.06**
Neighbourhood Facilities					-.09***	-.11***
Neighbourhood Satisfaction					-.16***	-.08***
R		.39***		.40***		.48***
R^2		.15***		.16***		.23***
R^2 Change		.15***		.01***		.07***

*** Correlation is significant at the 0.001 level

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Table 7 Summary of Hierarchical Regression Analysis for Variables Predicting Depression (n= 3357)

	Model 1		Model 2		Model 3	
Independent Variables	B	β	B	β	B	β
Socioeconomic Status	-.37***	-.46***	-.32***	-.39***	-.23***	.29***
Social Participation			-.22***	-.07***	-.18***	-.05***
Chronic Conditions			.54***	.20***	.51***	.19***
Neighbourhood Trust					-.13***	-.11***
Neighbourhood Safety					-.20***	-.09***
Neighbourhood Facilities					-.20***	-.09***
Neighbourhood Satisfaction					-.16	-.03
R		.46***		.50***		.55***
R^2		.21***		.25***		.30***
R^2 Change		.21***		.04***		.05***

*** Correlation is significant at the 0.001 level

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Table 8 Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety (n= 3335)

	Model 1		Model 2		Model 3	
Independent Variables	B	β	B	β	B	β
Socioeconomic Status	-.08***	-.30***	-.07***	-.26***	-.05***	-.20***
Social Participation			-.07***	-.06***	-.06***	-.06***
Chronic Conditions			.09***	.11***	.09***	.10***
Neighbourhood Trust					-.01	-.02
Neighbourhood Safety					-.08***	-.12***
Neighbourhood Facilities					-.02	-.02
Neighbourhood Satisfaction					-.01	.00
R		.30***		.32***		.35***
R^2		.09***		.10***		.12***
R^2 Change		.09***		.01***		.02***

*** Correlation is significant at the 0.001 level

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Discussion

Research Question 1

The aim of research question 1 was to explore the potential relationships between objective and subjective measures of the neighbourhood environment. We know the two are not synonymous, and the extent to which each has been found to reflect the other appears to differ based on context (Peters et al., 2020; Wahl & Gerstorf, 2020). However, previous research has pointed to the importance of both types of assessment when calculating person-environment interactions (Oswald et al., 2007; Wahl et al., 2012). In particular, Peters et al. (2020) note that objective measures of the neighbourhood may not reflect how older adults experience the environment. Conversely, while subjective accounts of the neighbourhood reflect attitudes about the neighbourhood that cannot be seen, they do not account for important structural features of the neighbourhood. Ultimately, studies that leverage the benefits of both assessment types are best placed to make inferences about the impact of the environment on Older Adults.

Overall, our study found several significant relationships between the OPERAT as an objective measure of neighbourhood and resident perceptions of Neighbourhood Quality as a subjective measure of the neighbourhood. Despite low numbers, these relationships were of greater significance and strength than those found in the initial study by OPERAT developers Burholt et al. (Burholt et al., 2016). However, in concordance with previous studies, the relationships between our objective and subjective measures of the neighbourhood were neither complete nor universal.

While the OPERAT tool shared several strong relationships with resident's perceptions of their environment, one relationship stood above the others, Natural Elements. Natural Elements, as measured by the presence of trees, public grass, and sounds of nature, assesses the environmental aesthetic of the neighbourhood. In addition, natural Elements was the only OPERAT subscale related to more than one aspect of perceived neighbourhood quality; sharing relationships with Neighbourhood Trust, Safety, and Satisfaction but not Neighbourhood Facilities. Support for this cluster of relationships comes from the phenomenon called 'Biophilia' (Ryan et al., 2014). Humans have an autonomous biological affinity to nature that leads to positive affect, increasing aesthetic attachment to an area (Jaśkiewicz, 2015; Ryan et al., 2014). These assumptions are reflected in the original

design and testing of the OPERAT tool by Burholt et al. (2016) based on Burholts' previous studies (2012) on place attachment in older adults residing in rural England.

Attachment with ones' neighbourhood has been shown in studies to correlate with feelings of relaxation (Lewick, 2012 as seen in Jaśkiewicz, 2015) and to be protective against urban incivilities (Félonneau, 2004). These studies indicate that natural elements in the environment influence our autonomic nervous system via the process of neuroception and provide a calming effect; Polyvagal Theory posits that such processing would increase feelings of safety and trust (Porges, 2018; van der Kolk, 2018). Given this sequence of relationships, it is not surprising that Natural Elements had the greatest relationships with subjective measures of Safety, Trust, and Satisfaction in neighbourhoods. In its simplest form seeing nature calms the nervous system leading to a sense of well-being in much the same way as seeing a friendly face (Jaśkiewicz, 2015; Porges, 2021).

Natural Elements was the only OPERAT scale predictive of Satisfaction with one's neighbourhood, contrasting with the validation study by Burholt et al. (2016), where relationships were found between Territorial Functioning and Navigation and Mobility, and subjective experiences of area enjoyment and area desirability. These relationships were relatively weak, however, in their much larger study population of 500. Thus, it is possible that similar relationship patterns would emerge in our findings with a larger population sample.

When we look more generally at the aesthetics of the neighbourhood, in terms of Territorial Functioning (well-kempt yards, personal styling visible, and house maintenance) and Incivilities and Nuisance (littering, graffiti, animal excrement, noise pollution), we can see that there are fewer relationships than those with Natural Elements despite the similar item focus on aesthetics, presentation, and beautification. However, both were predictive of perceived neighbourhood safety, suggesting that general presentation of the neighbourhood contributes to perceptions of safety. Neighbourhood incivilities have often been associated with lower levels of physical exercise in the area, which are mediated by perceptions of increased crime and danger (Foster et al., 2011; Owen et al., 2004). Territorial Functioning indicates the level of investment residents have in their neighbourhoods and property; higher levels of investment are likely seen as protective to other residents.

The real surprise was that despite at least 85% of our study population having one or more chronic conditions, objective Navigation and Mobility measures were unrelated to peoples' perceptions of their neighbourhood. So while Navigation and Mobility did appear to predict the overall Neighbourhood Quality, it was not predictive of Neighbourhood Trust, Safety, Facilities, or Satisfaction in their own rights. While the reason for this isn't entirely clear, it could be that in terms of walkability, the perception or actual use may be a more meaningful measurement than the infrastructure supporting Navigation and Mobility alone.

Navigation and Mobility are said to impact older peoples' independence in space, physical activity, and facilitate social cohesion (Borst et al., 2008; Burholt et al., 2016). However, studies have shown that the use of walkable environments fluctuates with perceptions of the area. Use of objectively walkable areas is subject to incivilities and nuisances (Ellaway et al., 2005; Foster et al., 2011; Foster & Giles-Corti, 2008), perceived safety (Borst et al., 2008; Foster et al., 2011; Owen et al., 2004) and aesthetic appeal (Borst et al., 2008; Ellaway et al., 2005).

The area of perceived environmental quality that the OPERAT was unable to capture was Neighbourhood Facilities. Non-residential buildings such as government buildings, medical practices, public libraries, grocery stores, and recreational facilities are all important aspects of a neighbourhood (Domènech-Abella et al., 2019; Gyasi et al., 2019; Kearns et al., 2015; Kowitt et al., 2020) that are not assessed in the OPERAT. While it is clear by looking at the content of the OPERAT, it was never intended to capture the built environment fully. However, it captures elements of the infrastructure, road and footpath structure and maintenance, street lighting and signage, house maintenance, and public grass, including parks.

An expected relationship might have been with Navigation and Mobility considering the three items in the Facilities scale pertained to access ("I can get to the shops easily", "I am close enough to any help I need", and "I am close enough to important facilities") but no such relationship existed. It could be that residents when recalling their perception of the neighbourhood, consider facilities outside of the strict boundaries assessed by the OPERAT or consider a means of travel that does not rely on features of Mobility. Thus, creating a scenario in which the useability of facilities as assessed by Neighbourhood Facilities is not representative of walkability as assessed by Navigation and Mobility. It's not the first time a

study has found a notable difference between walkability and useability in the neighbourhood, Domènich-Abella et al. (2019) found walkability to affect loneliness more in the presence of Depression and useability to be a more important influence in the absence of Depression.

In summary, the OPERAT is a unique tool in its sensitivity to the needs of Older Adults by including them at the design stage. The number and nature of relationships found between the OPERAT and perceived Neighbourhood Quality suggest that the OPERAT has sufficient utility as a tool to assess the neighbourhood environment in New Zealand. However, its greatest use may be in the planning of residential neighbourhoods that meet older residents' needs. Objective measures of the neighbourhood, such as the OPERAT, when used in conjunction with subjective measures of the neighbourhood, transform our Older Adults' lived experience at a personal level into tangible action points (Peters et al., 2020). While the OPERAT tool may be insufficient for this job alone, used alongside other objective measures of neighbourhood facilities has the important role of transforming population perceptions into tangible constructs for neighbourhood planning.

Hypothesis 1

Age as a Predictor of Social Determinants of Health and Well-being

Although it wasn't included in our final study model, we assessed bivariate correlations of Age within our model and found ageing to be associated with a higher perception of Neighbourhood Quality and lower risk of both Loneliness and Anxiety. Older participants also had higher levels of socioeconomic living standards and participated in more social activities. As expected, Chronic Conditions were also more prevalent in the older participants.

Older adults have often been shown to have higher levels of housing satisfaction even when residing in objectively undesirable locations, known as the housing satisfaction paradox (Jansen, 2014; Oswald et al., 2006). It would appear that older adults are particularly adaptable to poor living conditions (Oswald et al., 2006), likely resulting from a type of cognitive restructuring that reduces the gap between desired living conditions and actual living conditions (Jansen, 2014). Furthermore, given that our older adults were, in general, economically comfortable, they would have the financial freedom to adapt the

interior and exterior of their own homes to mitigate more distal neighbourhood features (Jansen, 2014), which may be contributing to the higher levels of perceived Neighbourhood Quality.

Social Determinants as Predictors of Neighbourhood Quality and Well-being

Because the environment is not the only theorised social determinant of health, our study included measures of several other determinants: Socioeconomic Status, Social Participation, and Chronic Conditions. We found that the factors associated with higher perceived Neighbourhood Qualities are also associated with Loneliness, Depression and Anxiety symptomology, and those associated with lower perceived Neighbourhood Qualities are associated with higher symptomology. Socioeconomic Status and Social Participation were associated with increased perceptions of Neighbourhood Quality and were protective against Loneliness, Depression, and Anxiety. Whilst the presence of Chronic Conditions was associated with a poorer perception of the neighbourhood and a risk factor for Loneliness, Anxiety, and to a significantly larger extent, Depression.

Based on individual and country-level data from previous studies, we could expect Socioeconomic Status to be a strong predictor of well-being (Domènech-Abella et al., 2017; Donahoe & McGuire, 2020; World Health Organization, 2020a). Indeed, in our study, Socioeconomic Status accounted for the largest portion of the variance in all Well-being outcomes measured. Socioeconomic Status was associated with greater perceived housing quality, and in turn, improved Well-being outcomes, though the individual relationships were not equal. In addition, Socioeconomic Status had a strong relationship overall with perceived Neighbourhood Quality, the strongest of which was with Neighbourhood Safety. This is unsurprising, given that Neighbourhood Safety was associated with increased Natural Elements and Territorial Functioning, which are seen to increase with socioeconomic wealth (Burholt et al., 2016; Domènech-Abella et al., 2017) and decreased Incivilities and Nuisance, which are seen to increase in areas of economic deprivation (Burholt, 2012).

In terms of Well-being outcomes, Socioeconomic Status impacted depressive symptomology the most, followed relatively closely by Loneliness and, to a lesser extent, Anxiety. While those relationships were anticipated, looking closer at the relationships between economic welfare and Loneliness did bring to light an interesting finding. Emotional Loneliness shares a stronger relationship with Socioeconomic Status than Social

Loneliness. Keeping in mind that Emotional Loneliness stems from lost attachment to close loved ones and social loneliness stems from lack of wider community relationships, we would have expected to see the opposite true. Dykstra and Gierveld (1999) found that Socioeconomic Status was only indirectly related to Loneliness, mediating the relationship between larger social networks seen in those with higher incomes and consequently lower levels of Loneliness. Our study, however, only found a very weak relationship between Socioeconomic Status and Social Participation.

Instead, it is proposed that Depression may be mediating the relationship between Emotional Loneliness and Socioeconomic Status. Depression has been found on many occasions to share bidirectional relationships with both Social and Emotional Loneliness (McHugh Power et al., 2020). Once again, the relationship between Social Loneliness and Depression was thought to be mediated by elements of the social network. However, the relationship between Emotional Loneliness and Depression was proposed to occur due to perceived or actual loss of attachment, intimacy, and family contact (Drennan et al., 2008), all of which can occur as consequences of the depressive symptom cluster (American Psychiatric Association, 2013). Increased support for this proposed relationship comes from our study data in which Depression shared a stronger relationship with Emotional Loneliness than with Social Loneliness.

Due to the way the survey responses are initially handled, any missing item response returns a missing data invalid response for the full scale regardless of whether a participant has responded to other items within the scale, in the case of Chronic Conditions that resulted in 45% of the participant data missing. However, in most of these missing data results, at least one condition was indicated as present. To mitigate the missing data, all non-responses were recoded to 0, allowing all scales scores to be calculated. In doing so, a further 4.9% of participants were assessed as having no Chronic Condition, giving a total of 12.8% of all participants, the other 40% of participants were distributed across the scale, with the majority scoring between 1 and 4 Chronic Conditions present. While this vastly increased the number of useable participants for the variable, it was risky to assume that no response meant the condition wasn't present. The result of this decision is that reported Chronic Conditions were potentially lower than present in the population; this might be particularly evident in the 4.9% who did not respond to the items at all. Bivariate

correlations were checked between all variables, and the unaltered Chronic Conditions data and correlations were comparable to the final data presented within this study with a slight (≤.03) increase in the strength of the relationship and increased statistical significance.

That being said, Chronic Conditions was predictive of socioeconomic deprivation, associated with greater symptomology on all measures of Well-being, and was related to poorer perceived Neighbourhood Quality. Chronic Conditions are frequently associated with lower income and higher health costs (Chiaranai et al., 2018; Hefford et al., 2005), so it is not surprising that the measure shared a significant relationship with Socioeconomic Status. Regarding bivariate relationships, Chronic Conditions is strongly related to Depression with weaker relationships to Anxiety and Loneliness, again Emotional more so than Social Loneliness. Similar relationships have been found between Chronic Conditions and Mental Health, with Chiaranai et al. (2018) finding loss of self, hopelessness, low mood, participation restriction, and dependency on others common themes among older adults with Chronic Conditions.

However, it should be noted that while we removed the Depression and other Mental Illness items from our Chronic Conditions scale to avoid assessing these twice, Mental Health conditions themselves often present as Chronic Conditions, so we expect them to behave similarly in their relation to other variables. Mental Health conditions such as Depression, Loneliness, and Anxiety can be theorised both as outcomes of Chronic Illness and as Chronic Illnesses in their own right. For example, Lam and Lauder (2000) found Depression to be the most disabling of the chronic diseases they studied, being the most likely to result in reports of sub-optimal Quality of Life across physical fitness, emotional problems, poor health, and social limitations.

Despite both Lam and Launder (2000) and Chiaranai et al. (2018) finding Chronic Conditions to be predictive of perceived social limitation, our study found Chronic Conditions to be significantly associated with increased Social Participation. While the relationship was very weak, it signals that comorbidity of conditions encourages social participation rather than representing a barrier to social activity and inclusion. It is possible that the social limitations perceived by those with Chronic Conditions are tied to the loss of specific activities but not to the total number of social activities as measured by our scale. After the multiple regression analysis, we can see that even though these relationships

remain significant, particularly for Depression, much of the association is weakened indicating once again that much of the relationship may be attributable to Socioeconomic Status.

Overall, Social Participation was the most weakly associated with all other variables despite each of those relationships being significant. Our data shows that Social Participation was slightly increased in areas where neighbourhood desirability was higher and was associated weakly with Socioeconomic Status and was approximately as effective at protecting against all of the Well-being variables. Social Participation was responsible for ever so slightly more variance in Depression and Anxiety than Loneliness. Our study does not confirm if this is a causative relationship or the product of social withdrawal and social avoidance behaviours seen with some Depressive episodes or Anxiety conditions (American Psychiatric Association, 2013).

Neighbourhoods as Predictors of Well-being

Our study found no relationships between the OPERAT or its subscales and Loneliness, Depression, or Anxiety. However, given the correlations between the OPERAT and perceived Neighbourhood Quality and Perceived Neighbourhood Quality and well-being as measured by Loneliness, Depression, and Anxiety, low participant numbers are likely responsible. Despite conducting a surplus of 250 OPERAT assessments across New Zealand, we could only match these with 60 New Zealand Health, Work, and Retirement Study participants. This is a much lower participant number than desired. It is plausible that some weaker relationships exist between the OPERAT and Well-being as measured by Loneliness, Depression, and Anxiety that failed to meet statistical significance. Targeted OPERAT assessments of the meshblocks in which current study participants reside and more extensive health-related data collection in those areas already assessed would give future studies a larger participant pool to uncover those potential relationships.

In that same population of 60, however, Neighbourhood Facilities shared a relationship with both overall Loneliness and Social Loneliness. This is interesting for two reasons. First, because a measure of perceived Neighbourhood Quality was able to produce a significant relationship with well-being where objective measures couldn't. Second, this relationship was with the one aspect of the environment not measured well by the OPERAT. Although the limited data makes interpretation difficult, the data suggests that either

Neighbourhood Facilities moderate the interactions between the environment and well-being, forming a protective resource, or that perception of the neighbourhood is a more important indicator of well-being than its actual physical properties.

Some theoretical models support this notion, most notably the Person-Environment Fit model based on the assumption that neither the environment nor the person's abilities predict outcomes but rather the interactions between them do (Oswald et al., 2007; Wahl et al., 2012). Subjective measures of Neighbourhood are one way we might attempt to measure Person-Environment Fit. Oswald et al. (2007) noted the importance of objective neighbourhood assessment but added that relying only on objective assessments risks disregarding the subjective nature in which older adults experience their neighbourhoods.

There is, of course, another explanation, this study model implies a causal relationship between the environment, both objective and subjective, and well-being, but our study hasn't been designed to predict the direction of the relationship. These results could also indicate that the environment doesn't impact well-being but rather that well-being impacts our perceptions of the neighbourhood environment. We have already noted studies that have shown neighbourhood perceptions are influenced by our well-being, both physical and mental (Black & Jester, 2020; Byrnes et al., 2006; Domènech-Abella et al., 2019; Oswald et al., 2006). In a reversed model, in which well-being conceptually precedes changes in neighbourhood perception, we might expect our results. In such an event, well-being would share a stronger relationship with perceived Neighbourhood Quality and be less related to the objective characteristics of the neighbourhood. This reasoning could explain why the OPERAT found no relationships with well-being, but perceived Neighbourhood Quality did. A much larger database of OPERAT assessments would be needed to test such a hypothesis and is outside of this study's objective.

As interesting as those findings were, the relationships are somewhat changed when we look at a larger population of the New Zealand Health, Work, and Retirement survey participants. With a larger participant base, a fuller picture of the intricacy of the relationships between perceived Neighbourhood Quality and well-being is revealed with relationships existing between all factors. For example, loneliness shared the strongest relationship with Neighbourhood Quality, followed closely by Depression, and while Anxiety

was related to Neighbourhood Quality, the strength of that relationship was almost half that of Loneliness and Depression.

Predictive value of the neighbourhood for well-being outcomes.

Overall, the model presented in this study accounts for a relatively small portion of the variance in Well-being outcomes. For example, our model explained the highest level of variance for Depression at 30% and for Loneliness at 23%. On the other hand, the model only accounted for 12% of the variance in Anxiety. Looking closer at the impact of each measure, we see that Socioeconomic Status represented the largest portion of the variance in all instances.

While all well-being outcomes were more heavily associated with socioeconomic status, Neighbourhood Quality was a small yet significant factor for each. Importantly, the relationship of each perceived aspect of the neighbourhood varied for each of the well-being outcomes. For instance, Loneliness was associated with all measures of perceived Neighbourhood Quality, but most strongly with Neighbourhood Trust and Facilities. Neighbourhood Quality also accounted for a larger proportion of variance in Loneliness than other measures of well-being. Neighbourhood Trust, Safety, and Facilities were related to Depression outcomes. Anxiety was the least related to Neighbourhood Quality though the relationship between Anxiety and Neighbourhood Safety remained after controlling for the other study variables.

These findings suggest that perceived Neighbourhood Safety is the most important environmental predictor of well-being outcomes in older adults, followed by perceived Neighbourhood Trust and Facilities and finally, Neighbourhood Satisfaction which was only associated with Loneliness. The existing research suggests that no one particular aspect of the neighbourhood environment, objective or perceived, universally predicts outcomes for older adults. For example, Choi & Matz-Costa (2018) found that neighbourhood safety shared a positive relationship with psychological health regardless of the participants physical functioning. Furthermore, social cohesion was only related to psychological well-being in physically impaired respondents, where it buffered the negative effects of poor neighbourhood safety. Another study found that the presence of fewer neighbourhood problems directly influenced satisfaction with social participation in older adults with

chronic illness but that neighbourhood safety, facilities and cohesion only indirectly affected participation (Hand et al., 2012). And Zandieh et al. (2016) found that walking behaviour in older adults was associated with economic deprivation, neighbourhood safety, and pedestrian infrastructure and aesthetics.

Bringing Objective and Subjective Measures of the Neighbourhood Together

While the OPERAT data did not uncover any direct relationships between the objective Neighbourhood and well-being outcomes, it is not without use for interpreting the outcome of our proposed hypothesis. Assuming previous theories are correct, perceived neighbourhood measures represent the experience of objective features of the neighbourhood in Older Adults (Peters et al., 2020). Thus, if we use the relationships between the OPERAT and perceived Neighbourhood Quality, we can predict those objective elements of the environment which should improve Loneliness, Depression, and Anxiety symptomology.

This extrapolation shows that to reduce the symptomology of Loneliness, increasing Natural Elements, such as trees and green spaces, would have the greatest accumulative effect on older adults. Efforts to improve Territorial Functioning and reduce Incivilities and Nuisances would bolster this effect. This inference is based on the strength of the relationship between Loneliness and Neighbourhood Trust. Neighbourhood Trust was most strongly associated with Natural Elements highlighting these as of the most importance. While associated with Loneliness, Neighbourhood Facilities did not correlate with the OPERAT, so we cannot deduce any objective measure of the environment here. Increasing the Territorial Functioning within the neighbourhood while simultaneously decreasing Incivilities and Nuisances will also create tangible reductions in Loneliness due to shared relationships with Neighbourhood safety. Neighbourhood Satisfaction adds to the argument for Natural Elements as a prime protector against Loneliness maintaining a weak correlation with Loneliness and a moderate relationship with Natural Elements only.

When we look at Depression and Anxiety, we can deduce that similar patterns hold. A shared relationship with Neighbourhood Safety suggests that increasing Natural Elements and, to a slightly lesser degree addressing Territorial functioning and Incivilities and Nuisances will reduce symptomology for both outcomes. The effects should be greater for Depression because it accounted for a greater amount of variance in this model and the

supplementary relationship with Neighbourhood Trust, which is again linked to Natural Elements.

As far as objective features of the environment go, Natural Elements such as trees, green space, and birdlife show the greatest potential to impact the overall spectrum of older adults positively. Of course, at this stage, the link is inferred from a triad of relationships in which well-being outcomes are most closely associated with perceptions of Neighbourhood Trust and Safety, which are themselves most closely predicted by Natural Elements within the environment. It seems that in terms of perceived Neighbourhood Quality and, in turn, well-being, our study confirms that older adults have a preference for aesthetically pleasing environments over pure practicality and usability as found in other studies (Borst et al., 2008; Owen et al., 2004; Peters et al., 2020).

Limitations

The assessment and subsequent scoring for the OPERAT is based on meshblocks, New Zealand's smallest official statistical area, most often consisting of a single residential block or a few smaller blocks in urban areas. However, people do not live their lives constrained to such definitions of Neighbourhood, meaning they provide a somewhat arbitrary division when assessing how the neighbourhood environment affects well-being in older adults. One example was one mesh block which had no parks or green space within it but had two substantial parks (one a multi-sport sports field with clubrooms and the other possessed a children's playground, shaded picnic area tennis courts, sports field, multiple clubs and the local pools and public splash pad) in adjacent mesh blocks to the assessed area.

Wahl & Gerstorf (2020) hypothesised that distal neighbourhood conditions might hold the ability to protect against suboptimal conditions more proximal to residents. Because residents do not live their lives entirely within the confines of their meshblock but rather have access to other mesh blocks, it is difficult to ascertain a direct relationship between their residential environment and well-being. The extent to which individual boundaries of 'Neighbourhood' differ and the impact on relationships between objective and subjective measures of neighbourhood environment is unclear (Peters et al., 2020).

As briefly discussed in the previous discussion of the relationships between neighbourhoods and well-being, our model presumed a causative relationship in which people living in more desirable neighbourhoods would report lower levels of Loneliness, Depression, and Anxiety. However, while we found a significant relationship of respectable strength, these were only calculated using bivariate correlation. Thus, despite knowing there is a relationship, we have no basis for claiming the neighbourhood as the cause of the change in well-being outcomes rather than alternative or bi-directional causation. As such, the inferences made assume that improving the identified areas of the environment will improve well-being. On paper, this might be a plausible assumption; if well-being increases alongside the number of trees present in a neighbourhood, it logically follows that planting trees will improve well-being; in practical application, however, we cannot be so certain.

Somewhat ironically, this has coincided with the Covid-19 pandemic reaching New Zealand shores. The worldwide pandemic was met with a tremendous public health tactic in New Zealand, which saw 'lockdowns and severe social isolation policies. A nationwide 'Level 4 Lockdown' from the 25th March 2020 to 27th April 2020 meant all residents were ordered to stay home except for accessing essential services such as groceries, medical care, and close to home physical activity (Faulkner et al., 2021). In addition, all non-essential businesses and facilities were shut down, many public spaces such as parks were closed to the public, face masks were compulsory while accessing essential services, inter-regional travel was heavily restricted, our borders were effectively closed, and social distancing of 2 meters was brought in. Following Level 4 restrictions, social distancing and face masks were highly recommended for much of the year.

As with other communicable diseases, older people and those with chronic illnesses were at the greatest risk of infection and severe side effects due to compromised immune systems. This led to stronger restrictions for many, with these populations advised avoiding even supermarkets; anecdotally, this led to many being fearful of the wider community and community spaces. It was unarguably a time of great social restriction and uncertainty for all. What is less clear is exactly how this may have affected our study. We can see that the prevalence of Loneliness, Depression and Anxiety in our study was higher than recorded in National Survey data. One study found that New Zealand adults reported greater mental health and well-being in the initial Lockdown period than our United Kingdom, Ireland, and

Australian counterparts (Faulkner et al., 2021). Despite faring better than our international counterparts, Every-Palmer et al. (2020) found significantly increased levels of psychological distress in adults aged 55+ during the Covid lockdown compared to the 2018/19 New Zealand Health Survey. The increase in psychological stress was more severe in younger age groups, presumably representing a greater number of disruptions to everyday life as schools and businesses closed their doors (Gasteiger et al., 2021).

Though we know there were sharp increases in psychological distress in response to the Covid-19 pandemic, it is unclear how this may have affected our study results. With the restrictions as they were, people spent more time in their homes and proximal neighbourhoods than usual, assuming they adhered to lockdown guidelines. Conceivably the psychological impact of Covid-19 may have been compounded by poor Neighbourhood Quality in some adults, but the extent to which that might have impacted the relationship between neighbourhood and well-being outcomes is currently impossible to calculate.

Implications

As is increasingly being recognised in the literature, there are differences between the objective and subjective accounts of the neighbourhood. This study sets a roadmap for how we might use the two assessments in combination to produce more meaningful information about environment-person interactions and their outcomes. While objective accounts of the neighbourhood provide important information about the structural features of the environment, they say little about how such features contribute or detract from older adults experiences of their neighbourhood. Conversely, while subjective perceptions offer insight into the experiences of older adults, they offer little tangible information concerning outcomes if we do not know the context in which they were formed. Taken together, objective and subjective measures of the neighbourhood provide a means to a deeper understanding of the relationship between the physical neighbourhood environment and the well-being of older adults.

Future Research

Due to low participant numbers, we did not find direct relationships between the OPERAT and well-being; instead, we relied on inferences based on the relationships between the OPERAT and Subjective Neighbourhood Quality. The existing research suggests

that direct relationships can be expected in the population but may be weaker. Therefore, future studies should focus on increased numbers through targeted OPERAT assessments. Doing so will increase the statistical power of the data and potentially reveal some of the weaker relationships proposed between the objective neighbourhood and Well-being outcomes.

Our data found a cluster of strongly inter-related variables, Socioeconomic Status, Depression, Chronic Conditions, and Emotional Loneliness, which appear to moderate relationships with other closely linked variables, most obviously Anxiety, Neighbourhood Trust, and Neighbourhood Safety. Additionally, we proposed that Depression may be moderating the relationship between Emotional Loneliness and Socioeconomic Status. While our study design did not test for moderating relationships, further study is warranted toward this cause. Finding variables that moderate the relationship between the neighbourhood environment and well-being outcomes may have important implications for the future planning of age friendly neighbourhoods.

Finally, further research might consider a longitudinal design to track changes in the neighbourhood both objectively and subjectively and any changes to well-being measures. In doing so, there is potential to demonstrate a causal effect between neighbourhood environment and well-being outcomes in older adults. Alternately a design in which neighbourhood environments are manipulated may be used, although there is currently weak evidence that such interventions result in changes in well-being (Moore et al., 2018).

Conclusion

This study set out to achieve two objectives; to investigate the relationships between objective and subjective measures of the neighbourhood and determine a link between the neighbourhood environment and Well-being outcomes as measured by Loneliness, Depression and Anxiety. In finding a number of connections between the OPERAT measures and aspects of perceived Neighbourhood Quality, we add to the growing literature recognising the necessity of using both objective and subjective measures of the neighbourhood when evaluating environmental impacts on well-being.

Although low participant numbers resulted in a lack of connection between an objective measure of the neighbourhood and Loneliness, Depression, Anxiety

symptomology, it was clear that aesthetic features of the neighbourhood bore the most impact. Natural Elements, trees, green spaces, and sounds of nature were most associated with positive perceptions of Neighbourhood Quality and, therefore, could be key considerations for environment-based interventions and the development of age-friendly neighbourhoods. Even though we cannot claim causality and some studies suggest weak evidence for environment-based interventions (Moore et al., 2018), there is evidence to indicate that increased Natural Elements will increase perceptions of safety and trust within communities, which increases the use of the available amenities (Choi & Matz-Costa, 2018; Owen et al., 2004; Zandieh et al., 2016).

Overall, perceptions of Neighbourhood Quality accounted for a small but significant portion of the variance in all well-being outcomes measured, Loneliness (both Social and Emotional), Depression, and Anxiety. While older adults generally perceive their neighbourhoods more favourably (Jansen, 2014), despite often less desirable living conditions, the current study supports using environment-based interventions to improve well-being outcomes. Regarding resident perceptions, well-being is the most closely related to perceptions of Safety and Trust within the neighbourhood. This aligns with existing literature describing perceptions of neighbourhood safety as a factor moderating the useability of structural features of the environment (Choi & Matz-Costa, 2018; Zandieh et al., 2016).

This study had some limitations which limit the implications of the data; for example, low numbers of objective neighbourhood assessments meant we needed to make assumptions about potential relationships between the objective environment and well-being in older adults based on perceptive assessments of the neighbourhood. We also face the unknown when considering the impact of Covid-19 on the well-being of our participants and how this may have impacted the subsequent relationships that were and were not found. However, it seems apparent that the neighbourhood environment, at least at the perceived level, is associated with the experience of Loneliness, Depression, and Anxiety.

Future studies should aim to refine the unity of objective and subjective measures of the neighbourhood to leverage the strengths of both assessment types. In doing so, these studies strengthen their ability to understand the interactions between structural features of the environment and their impact on the experience of older adults interacting with the

environment in daily life. This provides a stronger basis for longitudinal or experimental designs. Once causality is more firmly established within the literature, the implications of such studies will contribute to recommendations for neighbourhood planning in the future.

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Appendix A

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Health, Work and Retirement Study 2020

The School of Psychology
Te Kura Hinengaro Tangata
Massey University

HART
Health and Ageing Research Team

General instructions for completing the survey

Please read the following carefully

- You can decline to answer any particular question. If you choose not to answer a question, please leave it blank.
- There are no right or wrong answers; we want the response that is best for you.
- It is important that you give your own answers to the questions.
- Do not linger too long over each question; usually your first response is best.
- Completion and return of this survey implies consent to take part in this component of the study.

For each question in the survey you will be asked to provide either:

- a single response. Please mark with a cross (e.g. ✕) inside one box on each line in pen. If you make a mistake, simply scribble it out and mark the correct answer.
- one or more responses, as appropriate. For these items you will be instructed to *'Please cross all that apply'*.
- a written answer. To provide words, please print your answer as clearly as possible on the line provided.

Example question and response: Please cross 'Yes' to indicate if a health professional has told you that you have any of the following conditions:

(Please cross one box on each line)	No	Yes, in the last 12 months	Yes, prior to the last 12 months
Sleep disorder	✕ 1	2	3
Stroke	✕ 1	2	3
Cancer	1	✕ 2	3
Please specify cancer type:	melanoma		

- a number: where a number or date is required, print the figure in the box provided.

Example question and response: How many of the following people are you in regular contact with? Please place a zero or a number in the squares as appropriate:

Adult child(ren) and/or grandchild(ren)/mokopuna		5

Thank you for taking the time to complete this questionnaire.

If you need help to answer any questions, please contact us either on the HART free-phone line 0800 100 134 or via email: hart@massey.ac.nz

YOUR HEALTH, WELLBEING AND QUALITY OF LIFE

Q1 In general, would you say your health is: *(Please cross one box)*

Excellent	Very good	Good	Fair	Poor
☐	☐	☐	☐	☐

Q2 All things considered, how satisfied are you with your life as a whole these days? *(Please cross one box)*

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
☐	☐	☐	☐	☐

Q3 How would you rate your quality of life? *(Please cross one box)*

Very poor	Poor	Neither good nor poor	Good	Very good
☐	☐	☐	☐	☐

The following questions are about activities you might do during a typical day.

Q4 Does your health now limit you in these activities? If so how much?

(Please cross one box on each line)	Yes, limited a lot	Yes, limited a little	No, not limited at all
Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐	☐	☐
Climbing several flights of stairs	☐	☐	☐

Q5 During the past 4 weeks, how much of the time have you had any of the following problems with your work, or other regular daily activities as a result of your physical health?

(Please cross one box on each line)	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Accomplished less than you would like	☐	☐	☐	☐	☐
Were limited in the kind of work or other activities	☐	☐	☐	☐	☐

Q6 During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

(Please cross one box on each line)	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Accomplished less than you would like	☐	☐	☐	☐	☐
Did work or other activities less carefully than usual	☐	☐	☐	☐	☐

Q7 During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? *(Please cross one box)*

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐	☐	☐	☐	☐

Q8 These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much time during the past 4 weeks:

(Please cross one box on each line)	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Have you felt calm and peaceful?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Have you felt downhearted and depressed?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Did you have a lot of energy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q9 During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, whānau, etc.)? *(Please cross one box).*

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q10 How would you rate your memory at the present time? *(Please cross one box).*

Excellent	Very good	Good	Fair	Poor
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q11 Would you say your memory at the present time is better, about the same, or worse now than it was 2 years ago? *(Please cross one box).*

Better	Same	Worse
☐ 2	☐ 1	☐ 0

Q12 Please answer the following questions about yourself by indicating the extent of your agreement.

(Please cross one box on each line)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There is not enough purpose in my life.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
To me, the things I do are all worthwhile.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Most of what I do seems trivial and unimportant to me.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I value my activities a lot.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I don't care very much about the things I do.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I have lots of reasons for living.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q13 Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the past week (7 days).

(Please cross one box on each line)	**Rarely or none of the time**	**Some or a little of the time**	**Occasionally or a moderate amount of the time**	**All of the time**
I was bothered by things that usually don't bother me.	☐ 1	☐ 2	☐ 3	☐ 4
I had trouble keeping my mind on what I was doing.	☐ 1	☐ 2	☐ 3	☐ 4
I felt depressed.	☐ 1	☐ 2	☐ 3	☐ 4
I felt that everything I did was an effort.	☐ 1	☐ 2	☐ 3	☐ 4
I felt hopeful about the future.	☐ 1	☐ 2	☐ 3	☐ 4
I felt fearful.	☐ 1	☐ 2	☐ 3	☐ 4
My sleep was restless.	☐ 1	☐ 2	☐ 3	☐ 4
I was happy.	☐ 1	☐ 2	☐ 3	☐ 4
I felt lonely.	☐ 1	☐ 2	☐ 3	☐ 4
I could not "get going."	☐ 1	☐ 2	☐ 3	☐ 4

Q14 Please answer the items according to how you've felt in the last week. Indicate 'agree' if you mostly agree that the item describes you or indicate 'disagree' if you mostly disagree that the item describes you.

(Please cross one box on each line)	**Agree**	**Disagree**
I worry a lot of the time.	☐ 1	☐ 2
Little things bother me a lot.	☐ 1	☐ 2
I think of myself as a worrier.	☐ 1	☐ 2
I often feel nervous.	☐ 1	☐ 2
My own thoughts often make me nervous.	☐ 1	☐ 2

Q15 How often do you take part in sports or activities that are:

(Please cross one box on each line)	**More than once a week**	**Once a week**	**One to three times a month**	**Hardly ever or never**
...vigorous (e.g., running or jogging, swimming, aerobics)	☐ 1	☐ 2	☐ 3	☐ 4
...moderately energetic (e.g., gardening, brisk walking)	☐ 1	☐ 2	☐ 3	☐ 4
...mildly energetic (e.g., vacuuming, laundry/washing)	☐ 1	☐ 2	☐ 3	☐ 4

Q16 Here is a list of statements that people have used to describe their lives or how they feel. We would like to know how often, if at all, you think the following applies to you.

(Please cross one box on each line)	Often	Sometimes	Not often	Never
My age prevents me from doing the things I would like to.	☐ 1	☐ 2	☐ 3	☐ 4
I feel that what happens to me is out of my control.	☐ 1	☐ 2	☐ 3	☐ 4
I feel left out of things.	☐ 1	☐ 2	☐ 3	☐ 4
I can do the things that I want to do.	☐ 1	☐ 2	☐ 3	☐ 4
I feel that I can please myself what I do.	☐ 1	☐ 2	☐ 3	☐ 4
Shortage of money stops me from doing things I want to do.	☐ 1	☐ 2	☐ 3	☐ 4
I look forward to each day.	☐ 1	☐ 2	☐ 3	☐ 4
I feel that my life has meaning.	☐ 1	☐ 2	☐ 3	☐ 4
I enjoy the things that I do.	☐ 1	☐ 2	☐ 3	☐ 4
I feel full of energy these days.	☐ 1	☐ 2	☐ 3	☐ 4
I feel that life is full of opportunities.	☐ 1	☐ 2	☐ 3	☐ 4
I feel that the future looks good for me.	☐ 1	☐ 2	☐ 3	☐ 4

Q17 In the last 12 months, how many times have you seen a doctor or been visited by a doctor about your own health? By 'doctor' we mean any GP or family doctor, but not a specialist. *(Please cross one box)*

Never	1 time	2 times	3-5 times	6-11 times	12 times or more
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Q18 In the last 12 months, how many times have you yourself:

(Please cross one box on each line)	Never	1 or 2 times	3 or 4 times	5 or more times
Been admitted to hospital for one night or longer	☐ 1	☐ 2	☐ 3	☐ 4
Used a service at, or been admitted to, a hospital	☐ 1	☐ 2	☐ 3	☐ 4
Gone to a hospital emergency department as a patient	☐ 1	☐ 2	☐ 3	☐ 4
Consulted another health professional other than the above	☐ 1	☐ 2	☐ 3	☐ 4
Sought medical treatment for an accident or injury (including any of the above contacts)	☐ 1	☐ 2	☐ 3	☐ 4

Q19 To what degree would you say the COVID-19 pandemic has had a negative impact on your overall:

(Please cross one box on each line)	Not at all	A little bit	Moderately	Quite a bit	Extremely
Physical health	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Mental health	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q20 Has a health professional or government health agency ever told you that you have COVID-19?

☐ 1 **No** ☐ 2 **Yes**

We are interested in hearing about your experiences of the COVID-19 pandemic. There is space on the back page of the survey to write about these experiences if you wish.

Q21 Please indicate whether a health professional has ever told you that you have any of the following conditions.

(Please cross <u>one</u> box on each line)	**No**	**Yes, in the last 12 months**	**Yes, prior to the last 12 months**
Arthritis or rheumatism	☐ 1	☐ 2	☐ 3
Disorder of the neck or back. (e.g. lumbago, sciatica, chronic back or neck pain, vertebrae or disc problems)	☐ 1	☐ 2	☐ 3
Diabetes	☐ 1	☐ 2	☐ 3
A disability	☐ 1	☐ 2	☐ 3
Please specify disability: _____			
Heart trouble (e.g., angina or heart attack)	☐ 1	☐ 2	☐ 3
High blood pressure or hypertension	☐ 1	☐ 2	☐ 3
Depression	☐ 1	☐ 2	☐ 3
Other mental illness	☐ 1	☐ 2	☐ 3
Please specify other mental illness: _____			
Respiratory condition (e.g., bronchitis, asthma)	☐ 1	☐ 2	☐ 3
Sleep disorder	☐ 1	☐ 2	☐ 3
Stroke	☐ 1	☐ 2	☐ 3
Active or chronic gout	☐ 1	☐ 2	☐ 3
Active/chronic hepatitis, cirrhosis or other liver condition	☐ 1	☐ 2	☐ 3
Cancer	☐ 1	☐ 2	☐ 3
Please specify cancer (e.g. lung, leukaemia, melanoma): _____			
Other illness	☐ 1	☐ 2	☐ 3
Please specify other illness: _____			

Q22 Can you see ordinary newsprint? (with glasses or contact lenses if you usually wear them)
(Please cross <u>one</u> box)

Easily	**With difficulty**	**Not at all**
☐ 1	☐ 2	☐ 3

Q23 Can you hear a conversation with one other person (whether or not you usually wear a hearing aid)?
(Please cross <u>one</u> box)

Easily	**With difficulty**	**Not at all**
☐ 1	☐ 2	☐ 3

Q24 In the past six months, have you had any falls including a slip or trip in which you lost your balance and landed on the floor or ground (e.g., trip over on a footpath, slip down some stairs, fall from a ladder)? (*Please cross one box*)

No, not at all	Yes, once	Yes, twice	Yes, 3 or more times
☐ 1	☐ 2	☐ 3	☐ 4

Q25 In the past six months, have you slipped or tripped but managed to stop yourself falling (e.g., by grabbing furniture for support, or, regaining your balance)? (*Please cross one box*)

No, not at all	Yes, once	Yes, twice	Yes, 3 or more times
☐ 1	☐ 2	☐ 3	☐ 4

Q26 How many hours of sleep do you usually get in a 24-hour period, including all naps and sleeps?

☐☐ **Hours (range 1 – 24)**

Q27 How satisfied are you with your sleep? *(Please cross one box).*

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q28a What is your current driving status? *(Please cross one box)*

☐ 1 **Current driver** ☐ 2 **Past driver** ☐ 3 **Never been a driver (please go to Q29)**

Q28b In the last two years, have you been a driver in an auto accident (including minor bumps)? If so, in how many accidents? *(Please cross one box)*

☐ 1 **Yes, one** ☐ 2 **Yes, two or more** ☐ 3 **No, I have not (please go to Q29)**

Q28c Within these accident(s), in how many:

(Please cross one box on each line)	None	One	Two or more
Was an insurance claim submitted?	☐ 1	☐ 2	☐ 3
Were the police contacted?	☐ 1	☐ 2	☐ 3
Did someone need urgent medical attention or treatment?	☐ 1	☐ 2	☐ 3

The following questions are about your health and health related behaviours. Please cross the box that best answers each question.

Q29 Have you, at any stage of your life, ever been a regular smoker? (*Please cross one box*)

☐ 1 **Yes** ☐ 2 **No**

Q30 If you currently consider yourself a regular smoker, how many do you think you would smoke on an average day? (*Please cross one box*)

1 to 10	11 to 20	21 to 30	31 or more	Not a regular smoker
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q31 How often do you have a drink containing alcohol? (*Please cross <u>one</u> box*)

Never	Monthly or less	Two to four times per month	Two to three times per week	Four or more times a week
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q32a If you answered 'Never' at Q31, have you ever drunk alcohol in the past? (*Please cross <u>one</u> box*)

Yes	No	
☐ 1	☐ 2	**If 'No', go to Q33a**

Q32b How many drinks containing alcohol do you have on a typical day when drinking? (*Please cross <u>one</u> box*)

1 or 2	3 or 4	5 or 6	7 to 9	10 or more
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q32c How often do you have six or more drinks on one occasion? (*Please cross <u>one</u> box*)

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q33a Have you ever used or tried smoking cannabis (marijuana, grass, dope etc.)? (*Please cross <u>one</u> box*)

☐ 1 **Yes** ☐ 2 **No** **If 'No', go to Q34**

Q33b How often do you use cannabis at present? (*Please cross <u>one</u> box*)

Not at all	Less than once a month	At least once a month	At least once a week	Several times a week	Daily	Several times a day
☐ 1	☐ 3	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Q33c If you do use cannabis what reason are you most likely to use it for? (*Please cross <u>one</u> box*)

☐ 1 For recreational purposes

☐ 2 For physical pain relief

☐ 3 For mental health purposes

☐ 4 Other (please specify): _____

WHĀNAU, FAMILY AND FRIENDS

Q34 Do you provide unpaid care for:

(Please cross one box on each line)	Yes, daily	Yes, weekly	Yes, occasionally	No, never	Not applicable (I have none)
Your mokopuna/grandchildren?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Other people's whāngai/children?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q35 I contribute my time and/or labour to volunteer activities: (*Please cross one box*)

Very often	Often	Sometimes	Rarely	Never
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q36 How many hours do you contribute to volunteer activities per week?

☐☐ **Hours per week**

Q37 Please indicate whether or not you belong to any of these types of organisations:

(Please cross one box on each line)	No	Yes
Sports clubs	☐ 1	☐ 2
Community or service organisations that help people	☐ 1	☐ 2
Political party, or professional association, or business organisation	☐ 1	☐ 2
A trade union	☐ 1	☐ 2
Religious, church, or other spiritual organisation	☐ 1	☐ 2
Hobby, leisure time, or arts association/group	☐ 1	☐ 2
Group that supports cultural traditions, knowledge or arts	☐ 1	☐ 2
Any other, club, lodge or similar organisation	☐ 1	☐ 2

Q38 Please indicate for each of the statements below, the extent to which they apply to the way you feel now.

(Please cross one box on each line)	Yes	More or less	No
I experience a general sense of emptiness.	☐ 1	☐ 2	☐ 3
There are plenty of people I can rely on when I have problems.	☐ 1	☐ 2	☐ 3
There are many people I can trust completely.	☐ 1	☐ 2	☐ 3
There are enough people I feel close to.	☐ 1	☐ 2	☐ 3
I miss having people around.	☐ 1	☐ 2	☐ 3
I often feel rejected.	☐ 1	☐ 2	☐ 3

Q39 Think about your current relationships with friends, whānau/family members, co-workers, community members and so on. To what extent do you agree that each statement describes your current relationships with other people?

(Please cross <u>one</u> box on each line)	Strongly Disagree	Disagree	Agree	Strongly Agree
There are people I can depend on to help me if I really need it.	☐ 1	☐ 2	☐ 3	☐ 4
I feel that I do not have close personal relationships with other people.	☐ 1	☐ 2	☐ 3	☐ 4
There is no one I can turn to for guidance in times of stress.	☐ 1	☐ 2	☐ 3	☐ 4
There are people who depend on me for help.	☐ 1	☐ 2	☐ 3	☐ 4
There are people who enjoy the same social activities I do.	☐ 1	☐ 2	☐ 3	☐ 4
Other people do not view me as competent.	☐ 1	☐ 2	☐ 3	☐ 4
I feel personally responsible for the well-being of another person.	☐ 1	☐ 2	☐ 3	☐ 4
I feel part of a group of people who share my attitudes and beliefs.	☐ 1	☐ 2	☐ 3	☐ 4
I do not think other people respect my skills and abilities.	☐ 1	☐ 2	☐ 3	☐ 4
If something went wrong, no one would come to my assistance.	☐ 1	☐ 2	☐ 3	☐ 4
I have close relationships that provide me with a sense of emotional security and well-being.	☐ 1	☐ 2	☐ 3	☐ 4
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
There is someone I could talk to about important decisions in my life.	☐ 1	☐ 2	☐ 3	☐ 4
I have relationships where my competence and skills are recognised.	☐ 1	☐ 2	☐ 3	☐ 4
There is no one who shares my interests and concerns.	☐ 1	☐ 2	☐ 3	☐ 4
There is no one who really relies on me for their wellbeing.	☐ 1	☐ 2	☐ 3	☐ 4
There is a trustworthy person I could turn to for advice if I were having problems.	☐ 1	☐ 2	☐ 3	☐ 4
I feel a strong emotional bond with at least one other person.	☐ 1	☐ 2	☐ 3	☐ 4
There is no one I can depend on for aid if I really need it.	☐ 1	☐ 2	☐ 3	☐ 4
There is no one I feel comfortable talking about problems with.	☐ 1	☐ 2	☐ 3	☐ 4
There are people who admire my talents and abilities.	☐ 1	☐ 2	☐ 3	☐ 4
I lack a feeling of intimacy with another person.	☐ 1	☐ 2	☐ 3	☐ 4
There is no one who likes to do the things I do.	☐ 1	☐ 2	☐ 3	☐ 4
There are people I can count on in an emergency.	☐ 1	☐ 2	☐ 3	☐ 4
No one needs me to care for them.	☐ 1	☐ 2	☐ 3	☐ 4

CAREGIVING

These questions are about providing care for someone with a long-term illness, disability or frailty. By 'providing care', we mean practical assistance for at least 3 hours a week.

Q40 Have you provided care for someone with a long-term illness, disability or frailty within the last 12 months? (*Please cross one box*)

☐ 1 **Yes** ☐ 2 **No** **If 'No', go to Q63 on page 14**

Q41 In total, how many people with a long-term illness, disability or frailty do/did you regularly provide care for in the last 12 months? (*Please cross one box*)

One person	Two people	More than two people
☐ 1	☐ 2	☐ 3

Q42 Do you receive a *Supported Living Payment* for providing care for another person?

☐ 1 **Yes** ☐ 2 **No**

Please select the person you spent the most time caring for within the last 12 months. Tell us about that person and their circumstances at the time of care.

Q43 Approximately how old is/was the person you care(d) for?

☐☐ **Years**

Q44 How long have/had you been caring for this person?

☐☐ **Years** ☐☐ **Months**

Q45 How often on average do (did) you provide this care or assistance? (*Please cross one box*)

Every day	Several times per week	Once a week	Once every few weeks	Less often
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q46 On average, how many hours per week did/do you care for this person?

☐☐☐ **Hours per week**

Q47 Is the person you care(d) for your: *(Please cross one box)*

☐ 1 Spouse or partner	☐ 2 Mother-in-law or father-in-law
☐ 3 Mother or father	☐ 4 Brother or sister
☐ 5 Son or daughter	☐ 6 Friend
☐ 7 Other whanau member/relative	☐ 8 Other

Q48 Does/did the person you care(d) for: (*Please cross one box*)

☐ 1 Live with you	☐ 2 Live alone
☐ 3 Live with their whānau/family	☐ 4 Live in a nursing home or care facility
☐ 5 Live with their friends	☐ 6 Other

Q49 Does/did the person you care(d) for have any of the following major medical conditions or disabilities? *(Please cross all that apply)*

☐ Frailty in old age	☐ Stroke
☐ Intellectual disability	☐ Mental health problem (e.g., depression)
☐ Visual impairment	☐ Cancer
☐ Alzheimer's disease/dementia	☐ Respiratory condition (e.g., asthma, emphysema)
☐ Severe arthritis / rheumatism	☐ Other (please specify): _____

Q50 In your opinion, how severe are the symptoms of these major medical conditions or disabilities experienced by the person you care(d) for? (*Please cross one box*)

None	Mild	Moderate	Severe	Very severe
☐	☐	☐	☐	☐

Q51 Have there been occasions during the past 12 months when you provided help for the person you cared for in a crisis (e.g. an illness, accident, or family crisis) that has interfered with your other commitments?

☐ **Yes** ☐ **No**

Q52 How many separate crises did you help with in the past 12 months?

☐☐☐ **Number of crises in the past 12 months**

Q53 In all, how many days in the past 12 months were you away from work because of these crises?

☐☐☐ **Days in the past 12 months** **OR** ☐ **N/A**

Q54 Has the person you cared for been admitted to hospital in the past 12 months? (*Please cross one box*)

No	Yes	Yes, spent one night or more	Don't know
☐	☐	☐	☐

Q55 Do you provide help to the person you care(d) for with any of the following activities?

(Please cross <u>one</u> box on each line)	Yes	No
Dressing (including putting on shoes and socks)	☐ 1	☐ 2
Eating (such as cutting up food)	☐ 1	☐ 2
Drinking	☐ 1	☐ 2
Using the toilet (including getting up and down)	☐ 1	☐ 2
Managing continence	☐ 1	☐ 2
Bathing and showering	☐ 1	☐ 2
Getting in and out of bed	☐ 1	☐ 2
Getting in and out of a chair	☐ 1	☐ 2
Personal grooming	☐ 1	☐ 2
Preparing meals	☐ 1	☐ 2
Shopping for groceries	☐ 1	☐ 2
Making telephone calls	☐ 1	☐ 2
Managing their money (e.g., paying bills, keeping track of expenses)	☐ 1	☐ 2
Housekeeping	☐ 1	☐ 2
Laundry	☐ 1	☐ 2
Transportation	☐ 1	☐ 2
Mobility (walking, wheelchair or stairs)	☐ 1	☐ 2
Taking medications	☐ 1	☐ 2
Recreation or hobbies	☐ 1	☐ 2

Q56 Do you receive help in providing this care from any of the following?

(Please cross <u>one</u> box on each line)	Yes	Help is needed but not provided	Help is not needed	N/A
Your children	☐ 1	☐ 2	☐ 3	☐ 4
Your siblings	☐ 1	☐ 2	☐ 3	☐ 4
Your spouse/partner	☐ 1	☐ 2	☐ 3	☐ 4
Other whānau/family	☐ 1	☐ 2	☐ 3	☐ 4
Friends	☐ 1	☐ 2	☐ 3	☐ 4
Neighbours	☐ 1	☐ 2	☐ 3	☐ 4
Publicly funded services	☐ 1	☐ 2	☐ 3	☐ 4
Support agencies you or your family pay for	☐ 1	☐ 2	☐ 3	☐ 4
Voluntary support agencies	☐ 1	☐ 2	☐ 3	☐ 4
Other	☐ 1	☐ 2	☐ 3	☐ 4

Q57 If the person you care for **does not live with you**, please indicate the time it usually takes you to travel from your home and your work to the residence of the person you care for:

(a) Time it usually takes you to travel from your home to the person's residence?

☐ **Hours** ☐☐ **Minutes**

(b) Time from your workplace to the person's residence.

☐ **Hours** ☐☐ **Minutes** **OR** ☐ **I am not in the work force (go to Q59)**

Q58 In the last 12 months, please indicate if you used any of the following methods to provide help and support to the person you care for:

(Please cross one box on each line)	Never	Once	More than once	No, I do not have access to this
Taken leave without pay	☐	☐	☐	☐
Taken annual leave	☐	☐	☐	☐
Used your own sick leave	☐	☐	☐	☐
Taken "domestic" leave	☐	☐	☐	☐
Taken time in lieu, or worked flexitime in consultation with supervisor/colleagues	☐	☐	☐	☐
Paid someone else to provide care which you would have preferred to provide yourself	☐	☐	☐	☐
Arranged with another whānau/family member to provide the care you normally provide	☐	☐	☐	☐
Made phone calls or provided care yourself in work time	☐	☐	☐	☐
Reduced hours of work	☐	☐	☐	☐
Formalised care leave arrangement with employer	☐	☐	☐	☐
Working more from home	☐	☐	☐	☐
Flexible work hours	☐	☐	☐	☐
Changed work role or tasks to be less demanding (temporarily)	☐	☐	☐	☐
Postponement of certain tasks/activities	☐	☐	☐	☐

Q59 Do you have a good relationship with the person you care for? *(Please cross one box)*

Never	Sometimes	Often	Always
☐	☐	☐	☐

Q60 Overall, what is the effect on your life of providing care? My life is: (*Please cross one box*)

A lot better for it	A little better for it	Neither better nor worse for it	A little worse for it	A lot worse for it
☐	☐	☐	☐	☐

Q61 In the past 12 months, has assisting someone caused you:

(Please cross <u>one</u> box on each line)	No	Yes
To reduce the time spent on social activities?	☐ 1	☐ 2
To cancel holiday plans?	☐ 1	☐ 2
To postpone plans to enrol in education or training programme?	☐ 1	☐ 2
To move in with him or her?	☐ 1	☐ 2
To turn down a job offer or a promotion?	☐ 1	☐ 2
To have extra expenses?	☐ 1	☐ 2

Q62 In the past 12 months, has assisting someone:

(Please cross <u>one</u> box on each line)	No	Yes
Caused your health to suffer?	☐ 1	☐ 2
Caused you to miss full days of work?	☐ 1	☐ 2
Caused you to reduce your hours of work?	☐ 1	☐ 2
Caused you to quit your job?	☐ 1	☐ 2
Caused you to lose your job?	☐ 1	☐ 2
Caused you to spend less time with your tamariki/children?	☐ 1	☐ 2
Caused you to spend less time with spouse/partner?	☐ 1	☐ 2

WHERE YOU LIVE

Q63 Which one of the following options best describes the type of residence that you currently live in (your primary residence)? *(Please cross <u>one</u> box)*

- ☐ 1 House or townhouse (detached or 'stand alone')
- ☐ 2 House, townhouse, unit or apartment (joined to one or more other houses, townhouses, units or apartments)
- ☐ 3 Unit, villa or apartment in Retirement Village
- ☐ 4 Moveable dwelling (e.g., caravan, motor home, boat, tent)
- ☐ 5 Rest home or continuing care hospital
- ☐ 6 Other (Please specify): _____

Q64 In terms of the ownership arrangements your primary residence is: *(Please cross <u>one</u> box)*

- ☐ 1 Owned by yourself and/or spouse/partner **with a mortgage**
- ☐ 2 Owned by yourself and/or spouse/partner **without a mortgage**
- ☐ 3 Owned by whānau/family
- ☐ 4 Owned by a whānau/family trust
- ☐ 5 Private rental
- ☐ 6 State, Council or Kaumātua housing
- ☐ 7 Licence to occupy
- ☐ 8 Other (Please specify): _____

Q65 How long have you lived in your present home?

☐☐ **Years** ☐☐ **Months**

Q66 Please rate your level of agreement to each of these statements in relation to your present home.

(Please cross <u>one</u> box on each line)	**No, definitely not**		**Neutral**		**Yes, definitely**
I am satisfied with my house.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am satisfied with my neighbourhood.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am happy with the living conditions of my house.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
My house enables me to see friends and whānau/family as often as I like.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
My house enables me to participate in community activities as often as I like.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
My house supports all my daily activities.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
My home does not meet all my needs.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am able to keep my house warm.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
My house is difficult for me to clean.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I can get to the shops easily.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am close enough to any help I need.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am close enough to important facilities.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I feel safe at home.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I feel safe in my neighbourhood.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
The neighbourhood is peaceful.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I have peace of mind at home.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q67 How would you describe the condition of your current residence? (*Please cross one box*)

No repairs or maintenance needed right now	Minor maintenance needed	Some repairs and maintenance needed	Immediate repairs and maintenance needed	Immediate and extensive repairs and maintenance needed
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q68 Does your residence have a problem with dampness or mould? (*Please cross one box*)

No	Minor problem	Moderate problem	Major problem
☐ 1	☐ 2	☐ 3	☐ 4

Q69 In winter, is your current residence colder than you would like? (*Please cross one box*)

Yes - always	Yes - often	Yes - sometimes	No
☐ 1	☐ 2	☐ 3	☐ 4

Q70 Please rate your level of agreement to each of these statements in relation to your present neighbourhood:

(Please cross one box on each line)	Strongly disagree		Neutral		Strongly Agree
People in this area would do something if a house was being broken into.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
In this area people would stop children if they saw them vandalising things.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
People would be afraid to walk alone after dark.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
People in this area will take advantage of you.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
If you were in trouble, there are lots of people in this area who would help you.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Most people in this area can be trusted.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

WORK AND RETIREMENT

Q71 Since the COVID-19 pandemic was declared by the World Health Organisation (WHO) on March 11, 2020:

(Please cross one box on each line)	Yes	No
Have you engaged in any paid employment?	☐ 1	☐ 2
Have you been considered an essential worker?	☐ 1	☐ 2
Have you worked from home?	☐ 1	☐ 2
Has your hourly wage or salary been reduced?	☐ 1	☐ 2
Have your hours of paid employment been reduced?	☐ 1	☐ 2
Have you lost or left your job?	☐ 1	☐ 2
Have you been offered skills training from your employer to support how you do your job during the COVID-19 pandemic?	☐ 1	☐ 2

Q72 Has/will the COVID-19 pandemic be a factor in your decision to retire (i.e., earlier or later than you had previously planned)?

☐ 1 **Yes, plan to retire *earlier*** ☐ 2 **No change to plans** ☐ 3 **Yes, plan to retire *later***

Q73 Have you received any hardship assistance as a result of the COVID-19 pandemic?

(Please cross <u>one</u> box on each line)	**No**	**Yes**
Government assistance to support your business (if applicable)	☐ 0	☐ 1
Government assistance such as welfare benefits	☐ 0	☐ 1
Material assistance from non-government organisations, such as food banks	☐ 0	☐ 1
Assistance from lenders, such as a mortgage holiday from your bank	☐ 0	☐ 1
A Kiwisaver hardship withdrawal	☐ 0	☐ 1

Q74 If you are retired, at what age did you retire?

☐☐ **Age at retirement** ☐ 1 **I am not retired**

Q75 How many hours do you currently work in paid employment per week?

☐☐ **Hours**

Q76 Which of the following best describes your **<u>preferred</u>** work status? (i.e., what you would like to be doing) *(Please cross <u>one</u> box)*

Full-time paid work, for an employer	☐ 1
Part-time paid work, for an employer	☐ 2
Full-time self-employed paid employment	☐ 3
Part-time self-employed paid employment	☐ 4
Flexible work schedule negotiated with employer	☐ 5
Project or contract work (short term and full-time)	☐ 6
Project or contract work (short term and part-time)	☐ 7
Fully retired, no paid work	☐ 8
Full-time homemaker	☐ 9
Full-time student	☐ 10
Other (Please specify): _____	☐ 11

Q77 Which of the following best describes your **current** work status? *(Please cross one box in this column)*

Full-time paid work, for an employer	1	**go to Q79**
Part-time paid work, for an employer	2	
Full-time self-employed paid employment	3	
Part-time self-employed paid employment	4	
Flexible work schedule negotiated with employer	5	
Project or contract work (short term and full time)	6	
Project or contract work (short term and part time)	7	
Fully retired, no paid work	8	**go to Q107**
Full-time homemaker	9	
Full-time student	10	
Unable to work due to health or disability issue	11	
Unemployed and seeking work	12	**go to Q78**
Other (Please specify): _____	13	**go to Q107**

Q78 Please indicate how much you agree with the following statements about your own job-search process.

(Please cross one box on each line)	**Strongly disagree**				**Strongly agree**
I have had one or more job applications rejected based on my age.	1	2	3	4	5
I have omitted or modified my age/job history in an application out of concern that I would be discriminated against based on my age.	1	2	3	4	5

Thank you. If you were instructed to go to Q78 from Q77, please now go to Q107.

Q79 Which of the following best describes your current occupation? *(Please cross one box)*

1	Labourer (e.g., cleaner, food packer, farm worker)
2	Machinery operator/driver (e.g., machine operator, store person)
3	Sales worker (e.g., insurance agent, sales assistant, cashier)
4	Clerical/administrative worker (e.g., administrator, personal assistant)
5	Community or personal service worker (e.g., teacher aide, armed forces, hospitality worker, carer)
6	Technician/trades worker (e.g., engineer, carpenter, hairdresser)
7	Professional (e.g., accountant, doctor, nurse, teacher)
8	Manager (e.g., general manager, farm manager)
9	Other (Please specify): _____

Q80 How long have you worked for your current employer?

		Years			**Months**	**OR** ☐ **N/A**

Q81 If you are self-employed, how long have you been self-employed?

		Years			**Months**

Q82 Which of the following best describes your current work?

(Please cross one box on each line)	**Disagree**	**Somewhat disagree**	**Neither agree nor disagree**	**Somewhat agree**	**Agree**	**N/A**
I feel fairly well satisfied with my present job	☐	☐	☐	☐	☐	☐
Work should only be a small part of one's life	☐	☐	☐	☐	☐	☐
I am satisfied with the progress I have made toward meeting my overall career goals	☐	☐	☐	☐	☐	☐
I find my job to be very stressful	☐	☐	☐	☐	☐	☐
My job makes it difficult to be the kind of spouse or parent I'd like to be	☐	☐	☐	☐	☐	☐

Q83 Assume that your ability to work at your best has a value of 10 points. How many points would you give your current work ability? (0 means that you cannot currently work at all) (*Please cross one box*)

0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q84 How do you rate your current work ability with respect to the **physical** demands of your work? (*Please cross one box*)

Very good	**Rather good**	**Moderate**	**Rather poor**	**Very poor**
☐	☐	☐	☐	☐

Q85 How do you rate your current work ability with respect to the **mental** demands of your work? (*Please cross one box*)

Very good	**Rather good**	**Moderate**	**Rather poor**	**Very poor**
☐	☐	☐	☐	☐

The following questions relate to health and work impairment due to diseases

Q86 Is any illness or injury a hindrance to your current job? (*cross more than one alternative if needed*)

There is no hindrance/I have no diseases.	☐
I am able to do my job, but it causes some symptoms.	☐
I must **sometimes** slow down my work pace or change my work methods.	☐
I must **often** slow down my work pace or change my work methods.	☐
Because of my disease, I feel I am able to do only part time work.	☐
In my opinion, I am entirely unable to work.	☐

Q87 How many whole days have you been off work because of a health problem (disease or health care or for examination) during the past year (12 months)? (*Please cross one box*)

None at all	☐ 5
At the most, 9 days	☐ 4
10 – 24 days	☐ 3
25 – 99 days	☐ 2
100 – 365 days	☐ 1

Q88 Do you believe that – from the standpoint of your health – you will be able to do your current job **two years from now?** (*Please cross one box*)

Unlikely	Not certain	Relatively certain
☐ 1	☐ 4	☐ 7

Q89 Have you recently been able to enjoy your regular daily activities? (*Please cross one box*)

Often	Rather often	Sometimes	Rather seldom	Never
☐ 4	☐ 3	☐ 2	☐ 1	☐ 0

Q90 Have you recently been active and alert? (*Please cross one box*)

Often	Rather often	Sometimes	Rather seldom	Never
☐ 4	☐ 3	☐ 2	☐ 1	☐ 0

Q91 Have you recently felt yourself to be full of hope for the future? (*Please cross one box*)

Continuously	Rather often	Sometimes	Rather seldom	Never
☐ 4	☐ 3	☐ 2	☐ 1	☐ 0

Q92 Please indicate how much you agree or disagree with the following statements.

(Please cross one box on each line)	Strongly disagree						Strongly agree
I value being a member of my age group.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
My age group membership is important to me.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
My age group is central to who I am as a person.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
I have a strong sense of belonging to my own age group.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
I identify with being a member of my age group.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Q93 Please indicate how much you agree or disagree with the following statements.

(Please cross one box on each line)	Strongly disagree				Strongly agree	N/A
Some people in my workplace feel I have less ability because of my age.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Younger people find it easier to work at my workplace than older people do.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
My manager expects me to do poorly because of my age.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
At my workplace, people my age often face biased evaluations.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
My age does not affect people's perception of my ability.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Q94 Please indicate to what degree you agree with each item.

(Please cross one box on each line)	**Totally disagree**				**Totally agree**
Older workers are passed over or left out in cases of promotion or internal recruitment.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Older workers do not have equal opportunities for training during work time.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Younger workers are preferred when new equipment, activities or working methods are introduced.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Older workers less often take part in development appraisals with their superior than younger workers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Older workers have less wage increases than younger workers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Older workers are not expected to take part in change processes and new working methods to the same degree as their younger peers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q95 The following statements refer to your current occupation. Please indicate the extent to which you disagree or agree with each statement.

(Please cross one box on each line)	**Strongly disagree**				**Strongly agree**	**N/A**
I have constant time pressures due to a heavy work load.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I have many interruptions and disturbances while performing my job.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Over the past few years, my job has become more and more demanding.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I receive the respect I deserve from my superior or a respective relevant person.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
My job promotion prospects are poor.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I have experienced or I expect to experience an undesirable change in my work situation.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
My job security is poor.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Considering all my efforts and achievements, I receive the respect and prestige I deserve at work.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

	Strongly disagree				**Strongly agree**	**N/A**
Considering all my efforts and achievements, my job promotion prospects are adequate.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Considering all my efforts and achievements, my salary/income is adequate.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I get easily overwhelmed by time pressures at work.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
As soon as I get up in the morning I start thinking about work problems.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
When I get home, I can easily relax and 'switch off' work.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
People close to me say I sacrifice too much for my job.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Work rarely lets me go, it is still on my mind when I go to bed.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
If I postpone something that I was supposed to do today, I'll have trouble sleeping at night.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Q96 The following questions are about flexibility in the work place. Do you have access to the following options at your work place? **If yes**, do you take advantage of these options?

(Please cross one box on each line)	**Yes, I have access to this, and I do this**	**Yes, I have access to this, but I do not do this**	**No, I do not have access to this**	**N/A**
If you do shift work, can you choose which shift you work.	☐ 2	☐ 1	☐ 0	☐ 9
Choose a work schedule that varies from the typical schedule at your worksite.	☐ 2	☐ 1	☐ 0	☐ 9
Control when you take breaks.	☐ 2	☐ 1	☐ 0	☐ 9
Have input into the amount of overtime hours you work.	☐ 2	☐ 1	☐ 0	☐ 9
Have input into the number of hours you work.	☐ 2	☐ 1	☐ 0	☐ 9
Take extra "unpaid" vacation days.	☐ 2	☐ 1	☐ 0	☐ 9
Take paid time off to volunteer in the community.	☐ 2	☐ 1	☐ 0	☐ 9
Occasionally request changes in starting and quitting times.	☐ 2	☐ 1	☐ 0	☐ 9
Frequently request changes in starting and quitting times, such as on a daily basis.	☐ 2	☐ 1	☐ 0	☐ 9
Reduce your work hours and work on a part-time basis while remaining in the same position or at the same level.	☐ 2	☐ 1	☐ 0	☐ 9
Structure jobs as a job share with another person where both receive their "fair share" of compensation and benefits.	☐ 2	☐ 1	☐ 0	☐ 9
Compress the work week by working longer hours on fewer days for at least part of the year.	☐ 2	☐ 1	☐ 0	☐ 9
Take sabbaticals or career breaks. That is, take leave, paid or unpaid, of one or more months and return to a comparable job.	☐ 2	☐ 1	☐ 0	☐ 9
Take paid or unpaid time for education or training to improve job skill.	☐ 2	☐ 1	☐ 0	☐ 9
Take a paid leave for care giving or other personal or whānau/family responsibilities (e.g., parental or elder caregiving responsibilities).	☐ 2	☐ 1	☐ 0	☐ 9
Work part-year; that is work for a reduced amount of time on an annual basis (e.g., work full-time during the autumn, winter, and spring and then take the summer off).	☐ 2	☐ 1	☐ 0	☐ 9
Work for part of the year at one worksite, and then part of the year at another worksite.	☐ 2	☐ 1	☐ 0	☐ 9
Work from an off-site location (such as home) for part (or all) of the regular work week, possibly linked by telephone and computer.	☐ 2	☐ 1	☐ 0	☐ 9
Transfer to a job with reduced responsibilities and reduced pay, if you want to.	☐ 2	☐ 1	☐ 0	☐ 9
Phase into retirement by working reduced hours over a period of time prior to full retirement.	☐ 2	☐ 1	☐ 0	☐ 9

Q97 To what extent do you have access to the flexible work options you need to fulfil your work and personal needs? *(Please cross <u>one</u> box)*

Not at all	To a limited extent	To a moderate extent	To a great extent
☐ 1	☐ 2	☐ 3	☐ 4

Q98 Please indicate how much you agree or disagree with the following statements about your workplace.

(Please cross <u>one</u> box on each line)	Strongly disagree						Strongly agree	N/A
I am very happy being a member of this organisation/business.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8
I enjoy discussing about my organisation/business with people outside it.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8
I really feel as if this organisation/businesses' problems are my own.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8
I do not feel like 'part of the family' at my organisation/business.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8
I do not feel 'emotionally attached' to this organisation/business.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8
This organisation/business has a great deal of personal meaning for me.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8
I think that I could easily become as attached to another organisation/business as I am to this one.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8

Q99 The following statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have had this feeling, indicate how often you felt it by indicating the option that best describes how frequently you feel that way. If you have never had this feeling, indicate "Never".

(Please cross <u>one</u> box on each line)	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day
At my work, I feel that I am bursting with energy.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
At my job, I feel strong and vigorous.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I am enthusiastic about my job.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
My job inspires me.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
When I get up in the morning, I feel like going to work.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I feel happy when I am working intensely.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I am proud of the work that I do.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I am immersed in my work.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
I get carried away when I'm working.	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Q100 The following questions ask about opportunities for training available to you.

(Please cross one box on each line)	Yes	No	N/A
Have you received training from your employer/business in the past 12 months?	☐ 1	☐ 0	☐ 3
Have you been offered training by your employer/business, but not trained in the past 12 months?	☐ 1	☐ 0	☐ 3
Have you ever been offered training by your employer/business?	☐ 1	☐ 0	☐ 3

Q101 Please rate your level of agreement to each of these statements in relation to training opportunities in your present employment situation:

(Please cross one box on each line)	Strongly disagree				Strongly agree
I try to learn as much as I can from training programmes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I tend to learn more from training programmes than most people.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am usually motivated to learn the skills emphasised in training programmes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am willing to exert considerable effort in training programmes in order to improve my skills.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I believe I can improve my skills by participating in training programmes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I believe I can learn the material presented in most training programmes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Participation in training programmes is of little use to me because I have all the knowledge and skills I need to successfully perform my job.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am willing to invest effort to improve skills and competencies related to my current job.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am willing to invest effort to improve skills and competencies in order to prepare myself for a promotion.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q102 How often do you consider leaving your current job? *(Please cross one box)*

Never					Always
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Q103 What is the likelihood that you will be looking for a new job within the next year? *(Please cross one box)*

Low					High
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Q104 The following section contains questions that ask you to describe your thoughts and feelings toward retirement. It is important that you respond to a question even it if appears similar to others

(Please cross one box on each line)	Disagree strongly						Agree strongly
I would like to retire in the near future.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
I expect to retire in the near future.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Q105 Please indicate how much you agree or disagree with the following statement: *(Please cross one box)*

	Strongly disagree	Somewhat disagree	Moderately disagree	Neither agree nor disagree	Moderately agree	Somewhat agree	Strongly agree
I can financially afford to retire now	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Q106 At what age do you intend to permanently retire from paid work?

☐☐ **Years of age** **OR** ☐ 1 **I never intend to retire from paid work**

YOUR FINANCIAL WELLBEING

In this section we ask about your financial circumstances. Please be assured that your answers to these questions are completely confidential.

Please see notes at the back of the questionnaire to help work out your income, if needed.

Q107a From all sources of income, what do you expect your annual personal income **before tax** to be this financial year?
(*Please cross one box*)

- ☐ 1 **loss**
- ☐ 2 **zero income**
- ☐ 3 **$1 - $5,000**
- ☐ 4 **$5,001 - $10,000**
- ☐ 5 **$10,001 - $15,000**
- ☐ 6 **$15,001 - $20,000**
- ☐ 7 **$20,001 - $25,000**
- ☐ 8 **$25,001 - $30,000**
- ☐ 9 **$30,001 - $35,000**
- ☐ 10 **$35,001 - $40,000**
- ☐ 11 **$40,001 - $50,000**
- ☐ 12 **$50,001 - $60,000**
- ☐ 13 **$60,001 - $70,000**
- ☐ 14 **$70,001 - $100,000**
- ☐ 15 **$100,001 - $150,000**
- ☐ 16 **$150,001 - $200,000**
- ☐ 17 **$200,001 or more**

Q107b From all sources of income, what do you expect your annual household income **before tax** to be this financial year?
(*Please cross one box*)

- ☐ 1 **loss**
- ☐ 2 **zero income**
- ☐ 3 **$1 - $5,000**
- ☐ 4 **$5,001 - $10,000**
- ☐ 5 **$10,001 - $15,000**
- ☐ 6 **$15,001 - $20,000**
- ☐ 7 **$20,001 - $25,000**
- ☐ 8 **$25,001 - $30,000**
- ☐ 9 **$30,001 - $35,000**
- ☐ 10 **$35,001 - $40,000**
- ☐ 11 **$40,001 - $50,000**
- ☐ 12 **$50,001 - $60,000**
- ☐ 13 **$60,001 - $70,000**
- ☐ 14 **$70,001 - $100,000**
- ☐ 15 **$100,001 - $150,000**
- ☐ 16 **$150,001 - $200,000**
- ☐ 17 **$200,001 or more**

Q108 Do you currently receive New Zealand Superannuation? *(Please cross one box)*

Single rate	Couple rate	No

Q109 Do you currently receive a Veteran's Pension? *(Please cross one box)*

Single rate	Couple rate	No

Q110 Other than New Zealand Superannuation, please indicate what sources of financial support you and your partner (if applicable) currently have which will support you in your retirement years:

(Please cross all that apply)	Yourself	Your partner (if applicable)
None		
Kiwisaver		
Other employer sponsored superannuation		
Overseas superannuation or pension		
Other pension or superannuation		
Personal savings		
Inheritance or trust fund		
Iwi dividends		
Rental income (from property you own)		
Other personal investments		

Q111 For the following questions, please indicate whether or not you have (or have access to) the item:

(Please cross one box on each line)	Yes, I have it	No, because I don't want it	No, because of the cost	No, for some other reason
Telephone				
Washing machine				
At least two pair of good shoes				
Suitable clothes for important or special occasions				
Personal computer				
Home contents insurance				
Enough room for whānau/family to stay the night				

Q112 For the following questions, please indicate whether or not you do the activity:

(Please cross one box on each line)	Yes, I do it	No, because I don't want to	No, because of the cost	No, for some other reason
Keep the main rooms of your home adequately heated	☐ 1	☐ 2	☐ 3	☐ 4
Give presents to whānau/family or friends on birthdays, Christmas or other special occasions	☐ 1	☐ 2	☐ 3	☐ 4
Visit the hairdresser at least once every three months	☐ 1	☐ 2	☐ 3	☐ 4
Have holidays away from home for at least a week every year	☐ 1	☐ 2	☐ 3	☐ 4
Have a holiday overseas at least every three years	☐ 1	☐ 2	☐ 3	☐ 4
Have a night out for entertainment or socialising at least once a fortnight	☐ 1	☐ 2	☐ 3	☐ 4
Have whānau/family or friends over for a meal at least once every few months	☐ 1	☐ 2	☐ 3	☐ 4

Q113 The following are a list of things some people do to help keep costs down. In the last 12 months, have you done any of these things?

(Please cross one box on each line)	Not at all	A little	A lot
Gone without or cut back on fresh fruit and vegetables to help keep down costs	☐ 1	☐ 2	☐ 3
Continued wearing clothing that was worn out because you couldn't afford a replacement	☐ 1	☐ 2	☐ 3
Put off buying clothes for as long as possible to help keep down costs	☐ 1	☐ 2	☐ 3
Stayed in bed longer to save on heating costs	☐ 1	☐ 2	☐ 3
Postponed or put off visits to the doctor to help keep down costs	☐ 1	☐ 2	☐ 3
NOT picked up a prescription to help keep down costs	☐ 1	☐ 2	☐ 3
Spent less time on hobbies than you would like to help keep down costs	☐ 1	☐ 2	☐ 3
Gone without or cut back on trips to the shops or other local places to help keep down costs	☐ 1	☐ 2	☐ 3

The following questions are about your material standard of living – the things that money can buy. Your material standard of living does NOT include your capacity to enjoy life. You should NOT take your health into account.

Q114 Generally, how would you rate your material standard of living? (*Please cross one box*)

High	Fairly high	Medium	Fairly low	Low
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q115 Generally, how satisfied are you with your current material standard of living? (*Please cross one box*)

Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q116 How well does your total income meet your everyday needs for such things as accommodation, food, clothing and other necessities? (*Please cross <u>one</u> box*)

Not enough	Just enough	Enough	More than enough
☐ 1	☐ 2	☐ 3	☐ 4

Q117 Below are statements that people have made about their standard of living. Please indicate how true these statements are for you.

(Please cross <u>one</u> box on each line)	Not true for me at all				Definitely true for me
I can afford to go to a medical specialist if I need to.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am able to visit people whenever I wish.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am able to give to others as much as I want.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am able to do all the things I love.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I expect a future without money problems.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
My choices are limited by money.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I can afford to go to a dentist if I need to.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q118 To what degree has the COVID-19 pandemic had a <u>negative</u> impact on your economic wellbeing? *(Please cross <u>one</u> box)*

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

We are interested in hearing about your experiences of the COVID-19 pandemic. There is space on the back page of the survey to write about these experiences if you wish.

YOUR PERSONAL SITUATION

Q119 What gender do you identify as? (*Please cross <u>one</u> box*)

- ☐ 1 Tāne/Male
- ☐ 2 Wāhine/Female
- ☐ 3 Gender diverse (please specify) _____

Q120 Do you identify as: (*Please cross <u>one</u> box*)

☐ 1 Heterosexual/Straight	☐ 2 Gay/Lesbian
☐ 3 Bisexual	☐ 4 Other sexual identity
☐ 5 Uncertain	☐ 6 Prefer not to answer

Q121 When were you born?

Day: ☐☐ **Month:** ☐☐ **Year:** 1 9 ☐☐

Q122 Which one of these statements is true about you? (Please answer for your **current** marriage, partnership or situation). (*Please cross one box*)

☐ 1	I am married.	☐ 2	I am a widow or widower.
☐ 3	I am in a civil union/de facto/partnered relationship.	☐ 4	I am single.
☐ 5	I am divorced or permanently separated from my legal husband or wife.		

Q123 What is your highest educational qualification? (*Please cross one box*)

☐ 1	No qualifications
☐ 2	Secondary school qualifications (e.g., School Certificate, University Entrance, NCEA)
☐ 3	Post-secondary certificate, diploma, or trade diploma
☐ 4	University degree

Q124 Please cross as many options as you need to indicate all the people who live in the same household as you. Please also put in the number of people. If you live alone, please cross the option at the top of the table.

(Please cross all that apply)	Yes	Number 18yrs or over		Number under 18yrs	
I live alone	☐ 1				
My spouse, partner or de facto, boyfriend or girlfriend	☐ 1				
My parent(s) and/or parent(s)-in-law	☐ 1				
My son(s) and/or daughter(s)	☐ 1				
My sister(s) and/or brother(s)	☐ 1				
My flatmate(s)	☐ 1				
My mokopuna/grandchild(ren)	☐ 1				
My friend(s)	☐ 1				
My boarder(s)	☐ 1				
Others (Please specify): _____	☐ 1				

Q125 Please indicate below which ethnic group or groups you belong to: (*Please cross all that apply*)

☐ 1	Māori	☐ 1	Niuean
☐ 1	New Zealand European	☐ 1	Chinese
☐ 1	Samoan	☐ 1	Indian
☐ 1	Cook Island Māori	☐ 1	Tongan
☐ 1	Other (please specify e.g., Dutch, Japanese, Tokelauan): _____		

Q126a Which country were you born in? (*Please cross one box*)

☐ 1	New Zealand	☐ 2	India
☐ 3	Australia	☐ 4	South Africa
☐ 5	England	☐ 6	Samoa
☐ 7	People's Republic of China	☐ 8	Cook Islands
☐ 9	Other (print the name of the country):		

Q126b If you were **not** born in New Zealand, please indicate below the approximate date that you first arrived to live in New Zealand.

☐☐ **Month (e.g. 04)** ☐☐☐☐ **Year (e.g. 1985)**

Q127 What term best describes how you generally identify yourself when asked what your religion or belief system is? (*Please cross one box*)

☐ 1 Rātana	☐ 2 Islam	☐ 3 Hinduism
☐ 4 Ringatū	☐ 5 Sikh	☐ 6 Judaism
☐ 7 Christianity	☐ 8 Buddhism	☐ 9 Taoism
☐ 10 Agnostic	☐ 11 Atheist	
☐ 12 Other (please specify):		

Q128 How often do you take part in religious services? *(Please cross one box)*

More than once a week	Once a week	One or three times a month	A few times a year	Less often	Never
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Q129 How often do you pray? *(Please cross one box)*

Several times a day	Once a day	More than once a week	Once a week	One to three times a month	A few times a year	Less often	Never
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8

Q130 How often do you meditate? *(Please cross one box)*

Several times a day	Once a day	More than once a week	Once a week	One to three times a month	A few times a year	Less often	Never
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8

Q131 How important is it to take part in religious services? *(Please cross one box)*

Very much so	Quite a bit	Moderately	Not very much	Not at all
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q132 How important is personal prayer for you? *(Please cross one box)*

Very much so	Quite a bit	Moderately	Not very much	Not at all
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q133 How important is meditation for you? *(Please cross one box)*

Very much so	Quite a bit	Moderately	Not very much	Not at all
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q134 To what extent does any connection to a spiritual being help you to get through hard times? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q135 To what extent does faith give you comfort in daily life? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q136 To what extent do you feel your life has a purpose? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q137 How much does spiritual strength help you to live better? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q138 To what extent do you have inner peace? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q139 To what extent are you hopeful about your life? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q140 How satisfied are you that you have a balance between mind, body and soul? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q141 To what extent are you able to experience awe? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q142 To what extent do you feel life to be meaningful? *(Please cross one box)*

Not at all	A little	Moderately	Mostly	Completely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

If you have Māori ancestry, continue with Q143,

if you DO NOT, please turn to page 33.

Q143 How would you rate your overall ability with Māori language? (*Please cross <u>one</u> box*)

Excellent	Very good	Good	Fair	Poor	None
☐	☐	☐	☐	☐	☐

Q144 The scale has been designed so that you will probably find that you agree with some statements but disagree with others to varying degrees. There are no right or wrong answers.

(Please cross <u>one</u> box on each line)	Strongly disagree						Strongly agree
I reckon being Māori is awesome.	☐	☐	☐	☐	☐	☐	☐
I love that I am Māori.	☐	☐	☐	☐	☐	☐	☐
Being Māori is NOT important to who I am as a person.	☐	☐	☐	☐	☐	☐	☐
I try to kōrero (speak) Māori whenever I can.	☐	☐	☐	☐	☐	☐	☐
I know how to behave the right way when I am on a marae.	☐	☐	☐	☐	☐	☐	☐
I have a clear sense of my Māori heritage and what it means for me.	☐	☐	☐	☐	☐	☐	☐
I believe that my taha wairua (my spiritual side) is an important part of my Māori identity.	☐	☐	☐	☐	☐	☐	☐
I can sometimes feel my Māori ancestors watching over me.	☐	☐	☐	☐	☐	☐	☐
I have never felt a spiritual connection with my ancestors.	☐	☐	☐	☐	☐	☐	☐
	Strongly disagree						**Strongly agree**
I stand up for Māori rights.	☐	☐	☐	☐	☐	☐	☐
What the European settlers did to Māori in the past has nothing to do with me personally. I wasn't there and I don't think it affects me at all.	☐	☐	☐	☐	☐	☐	☐
I think that Māori have been wronged in the past, and that we should stand up for what is ours.	☐	☐	☐	☐	☐	☐	☐
I think it is easy to tell that I am Māori just by looking at me.	☐	☐	☐	☐	☐	☐	☐
People would never know that I am of Māori descent just by looking at me.	☐	☐	☐	☐	☐	☐	☐
I think it is hard to tell that I am Māori just by looking at me.	☐	☐	☐	☐	☐	☐	☐
If a problem arises that people cannot solve by themselves, the whānau as a whole will be able to solve it.	☐	☐	☐	☐	☐	☐	☐
People in my whānau have always been able to discuss problems that affect everyone.	☐	☐	☐	☐	☐	☐	☐
Whenever my whānau undertake a project together, we know that we will all work hard until it is accomplished.	☐	☐	☐	☐	☐	☐	☐

INTERVIEW INVITATION

To better understand people's experiences, we sometimes invite participants in the Health, Work and Retirement study to take part in face to face interviews based on their responses to the survey.

If you are interested in being asked to participate in an interview (after receiving more information about it), please cross the box below and provide a phone number and/or email address in the boxes below.

☐ **Yes, I am willing to be contacted regarding an interview**

CONTACT DETAILS

Whether or not you are interested in an interview, please consider providing us with a phone or email contact, in case you are no longer reachable at your current address. These details are stored separately to survey data.

Phone number:

Email address:

If you need to change your address, please enter your new address in the space below.

Street:

Suburb

Town/City

Postal code

GUIDE NOTES

Why do you want to know my income?

Information such as income are used to help determine how well respondents to the New Zealand Health, Work and Retirement survey represent the general New Zealand population and whether income is a feature in ageing well. All of the answers you give are kept confidential.

How do I work out my annual personal/household income?

Remember:

- If you and your spouse/partner earn income jointly, only include your part of that income when reporting your personal income.
- Count any payments that are taken out of your income **before** you get it, such as repayments of student loans, union fees, fines or child support.
- DON'T count loans (including student loans), inheritances, sale of household or business assets, lottery wins, matrimonial / civil union / de facto property settlements or one-off lump sum payments.
- DON'T count money given by members of the same household to each other. For example, pocket money given to children, or money given for housekeeping expenses by a flatmate.

Calculating annual income before tax: If you know your weekly or fortnightly income **after tax**, use this table to work out your annual income **before tax**.

After tax weekly income$	After tax fortnightly income $	Before tax annual income $
up to 86	up to 172	21 – 5,000
87 – 172	173 – 343	5,001 – 10,000
173 – 256	344 – 512	10,001 – 15,000
257 – 335	513 – 671	15,001 – 20,000
336 – 414	672 – 829	20,001 – 25,000
415 – 493	830 – 987	25,001 – 30,000
494 – 573	988 – 1,145	30,001 – 35,000
574 – 652	1,146 – 1,303	35,001 – 40,000
653 – 805	1,304 – 1,610	40,001 – 50,000
806 – 939	1,611 – 1,879	50,001 – 60,000
940 – 1,074	1,880 – 2,147	60,001 – 70,000
1,075 – 1,459	2,148 – 2,918	70,001 – 100,000
1,460 – 2,102	2,919 – 4,203	100,001 – 150,000
2,103+	4,204+	150,001+

Standard NZ Super: these are the approximate standard **before tax** rates for NZ Super.

	Fortnightly before tax	Annual before tax
Single, living alone	$981.46	$25,517.96
Single, sharing accommodation	$902.58	$23,467.08
Married person or partner in a civil union or de facto relationship	$705.26	$18,336.76
Married or in a civil union or de facto relationship, both qualify	$744.54	$19,358.04

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Thank you for completing the survey!

Please return the questionnaire in the reply-paid envelope enclosed.

We greatly appreciate your help with this questionnaire regarding your experiences of health, work and retirement in New Zealand.

We are interested in hearing about your thoughts and experiences on any of the topics in the survey. Please use this space to write any comments you may have, including any regarding the COVID-19 pandemic.

Older People's External Residential Assessment Tool 2016

Postcode			Number of properties		
Date		Time of assessment		Duration of assessment	

Street Level Observations

Tick yes or no for items 1-7	**YES**	**NO**
1. Is there public grass or verges?		
2. Are there sounds of nature (e.g. birdsong, water)?		
3. Are there clear and easy to read road name signs?		
4. Are there street lights?		
5. Are there any unlit alleyways?		
6. Are there instances of littering, dog fouling or broken glass?		
7. Are there loud traffic or industrial noises?		

Tick a single box which corresponds to the response for items 8-13

8. Approximate number of vehicles that drove past during assessment?

- ☐ NONE
- ☐ ONE TO ELEVEN
- ☐ TWELVE OR MORE

9. What is the nature of parking on the street?

- ☐ NOT RESIDENTS ONLY
- ☐ RESIDENTS ONLY

10. Is there a continuous pavement, that is wide enough for 2 people or a wheelchair and is well maintained

- ☐ NO PAVEMENT
- ☐ YES, BUT NOT CONTINUOUS, NARROW OR NOT WELL MAINTAINED
- ☐ YES, CONTINUOUS, WIDE/MODERATELY WIDE, WELL MAINTAINED

11. How steep is the pavement and/or road?

☐ **FLAT:**

☐ **MEDIUM: Slight incline, not troublesome to walk up**

☐ **STEEP: Substantial incline, taxing to walk up**

12. How well is the road maintained?

☐ **WELL: Good condition, no maintenance required**

☐ **MODERATELY: Only minor repairs required**

☐ **POORLY: Lots of pot holes, trip risks, no evidence of repair**

13. What is the main outlook?

☐ **RESIDENTIAL**

☐ **GREEN OR SEA**

☐ **AGRICULTURAL INDUSTRIAL, INDUSTRIAL OR COMMERCIAL**

Property Level Observations

Tick response for items 14-17 for each property listed in the 1st column. Count and total the ticks in the highlighted columns

Name or number of property	14. Are there trees in the garden?		15. Is there any external beautification?			16. How well maintained is the garden/front yard?				17. How well maintained is the outside of the property?		
	YES	NO	YES	NO	N/A	WELL	MOD	POOR	N/A	WELL	MOD	POOR
TOTAL												