EXPLORING UNDERINSURANCE WITHIN NEW ZEALAND

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EXECUTIVE SUMMARY

PROJECT AIMS

This report was commissioned by the industry body in New Zealand, the Investment Savings and Insurance Association (ISI), who engaged staff at the School of Economics and Finance at Massey University to investigate the extent and degree of underinsurance of personal risk.

New Zealand has the third lowest penetration of insurance among 31 OECD countries. Insurance is used as part of the process of managing financial risk, and insufficient insurance means there is insufficient protection against adverse financial events. However, there is limited understanding of the extent of underinsurance in New Zealand. This study investigates this issue using a sophisticated life-cycle-planning model based on data from a comprehensive ISI survey of 2000 households. The focus is on insurance covering life, disability income and income protection, and trauma/dread disease.

The study explores the causes of personal underinsurance and seeks to quantify the extent of underinsurance at a national level and estimate the national cost of underinsurance to the government. However, it is important to note that there are limitations in these national figures that mean they must be used with caution.

REASONS FOR UNDERINSURANCE

International literature commonly assumes that people insure because they are risk-averse, and want protection against the costs of low-probability, high-cost, adverse events. They are prepared to pay to reduce the risk. Incorrect decisions may be due to misinformation or lack of information, reliance on government, high cost of insurance, unwillingness to consider the issues, or lack of trust in or understanding of the insurance products on offer.

The underinsured include those with too little insurance or no insurance; although, those with no insurance may not need insurance. The general conclusion is that many have no cover, and of those with cover, large proportions are underinsured. One recent US study found that 42% of middle-American households in their survey lacked life insurance, and many of the others were underinsured. An Australian study published in 2005 found only 22% of those surveyed had life cover. Studies have also shown that people are poorly informed on the nature of cover. By contrast, house and car insurance are far more common.

DEFINING ADEQUATE COVER

Non-insurance is easy to define, but major methodological issues have hindered research into underinsurance, predominately due to the problem of defining "adequate insurance". The study uses the standard international definition of "underinsured" as less than 80% of ideal life insurance, and "severely underinsured" as less 60% of ideal cover. The study defines "adequate coverage" for income protection as the industry standard figure of 75% of pre-tragedy net consumption. Adequate cover for trauma is taken as the greater of $50,000 or six months income.

RESULTS

The survey results show rates of life insurance ownership which are similar to those in the US or Australia. Levels of life cover are also comparable. Similar results are obtained for TPD, trauma and income protection insurance.

There is no indication that there is a national crisis with take up rates of life insurance ownership, though there is strong evidence of high levels of underinsurance so that levels of cover do not correspond to actual financial vulnerability. There is also evidence of inertia in coverage levels, as well as indications that calculations of required life cover are inadequate, as illustrated by the typical underinsurance of the primary earner and over-insurance of the secondary earner.

The survey shows that the biggest issue within New Zealand seems to be the low levels of ownership of personal insurance around permanent disability, such as TPD or long-term income protection cover. This may be due to a perceived lack of value for money, that is, high premiums for expected benefit.

Our estimate of the total level of life underinsurance is $141.918 billion. The estimate of lost tax revenue to the central government is $2.2M. Estimates of the benefit saving to government per fully insured family group is $9,017 p/a, while for the non-family groups it is $6,638 p/a. If this figure is used at 50%, then the implied saving is $3,319 p/a per impacted household. If we assume that there is 50% underinsurance then the implied national savings from full life insurance cover is $3.5M.

Estimates relating to disability are more vague as disability incidence data are not available. Using estimated incidence rates and combining the family and non-family groups would thus give a ballpark estimate of implied savings to government of full income protection insurance of $25M to $35M.

As noted above, it is important to note that these estimates carry a number of limitations that restrict their usefulness. These limitations include the assumptions made as part of the calculations, the reliance on information supplied by respondents, and the exclusion of some parts of the New Zealand population from the survey.

These figures can be used when looking at studies of policy measures for increasing the uptake of personal risk insurance. For example, they could be applied on a per capita basis on a cost-benefit when analysing possible remedial government policy measures.

CONCLUSIONS
There is no indication that there is a national crisis with low levels of life cover. Levels of non-insurance are high within groups which have lower needs for life cover, such as singles, and are at internationally comparable levels for groups with higher needs, such as families. There is, however, strong evidence that levels of life cover are often poorly chosen, with little relationship between ideal cover and actual cover. For example, couples tend to insure both spouses for the same or similar amounts, despite sharply differing
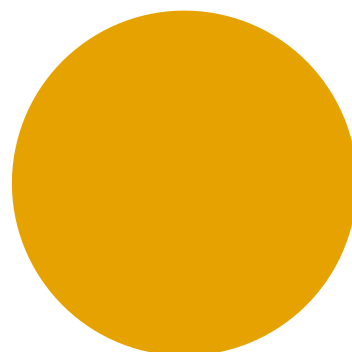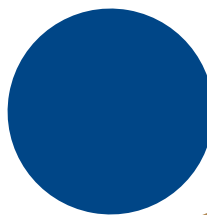
actual insurance needs, leading to underinsurance of the primary earner and over-insurance of the secondary earner. This indicates that the considerations of New Zealanders about adequate insurance cover levels, or the advice they have received, is inadequate.

The reasons for decision making around life cover levels need research. It could be noted that modern family structures are becoming more flexible, with fewer nuclear families, so the traditional insurance market is disappearing. Insurance company products and marketing seem to not be capturing this new family complexity. We found that traditional insurance measures, like income multiples, do not correlate to actual needs.

It needs to be noted, however, that the report's calculation of "ideal" cover uses many assumptions about family structure and finances, which may only be approximately true. The underinsurance figures should therefore be regarded as ballpark figures only.

Caution is thus needed with the conclusions - a degree of underinsurance is fine. Our results do show, however, clear underinsurance for the majority of family groups on the life of the main earner, involving a drop in present net consumption of more than 40 percent.

The study shows that the bigger issue within New Zealand seems to be the low levels of ownership of personal insurance around permanent disability, like

TPD or long-term income protection cover. Most families have high levels of financial vulnerability to medium or long term disability. Analysis of results by AC Nielsen shows similar reasons for non- or low levels of disability insurance cover as for life and show that the main reasons cited by respondents who do not have cover relate to it not being important or too expensive. Similar results were found for levels of inadequate cover.

Other survey results show that respondents did not regard personal insurance as a priority, or had not given it much thought. This implies that New Zealanders generally do not, or do not like to, contemplate adverse events and their financial impact. It can be hard to recognise vulnerability to rare events. The industry as a whole is responding to this by trying to simplify the process and approach customers in low cost avenues like websites. These websites, however, generally have extremely low quality cover calculation tools and advice, and do not offer the personal contact which is often an essential ingredient of an insurance purchase. There is a strong need for promotion of non-life personal risk insurance products.

However, given high rates of life insurance ownership within families, the main issue is lack of periodic review of cover levels. Childless singles or couples do not seem to contemplate their vulnerability to medium term or permanent disability, possibly because of a lack of trigger events. There seems to be a general lack of trigger events around disability insurance decision making. The AC Nielsen analysis shows a surprisingly high tendency to regard ACC as adequate for disability cover and a lack of awareness that illness, which is statistically more likely, is not covered. There is a major need to educate New Zealanders on the hazards of disability, which is statistically more likely than death. A good starting point for this would be the automatic inclusion of TPD cover into life cover, especially mortgage related products. Another area for consideration would be including life and other personal insurance cover as part of Kiwisaver.

MAIN REPORT

INTRODUCTION

This report was commissioned by the insurance industry body in New Zealand, the Investment Savings and Insurance Association (ISI), who engaged staff at the School of Economics and Finance at Massey University to investigate the extent and degree of underinsurance of personal risk in New Zealand. This report uses data from the most comprehensive survey on life insurance ever conducted in New Zealand and applies methodology which meets the highest international standards. It should be read in conjunction with the AC Nielsen quantitaive survey.

Concerns have been expressed that New Zealanders do not have adequate life insurance, with claims that the level of underinsurance in New Zealand is such that it is becoming a major social policy issue. Data from the OECD shows that in 2009, the most recent data available, New Zealand had the third lowest penetration of insurance among 31 OECD countries, with only Greece and Mexico having a lower insurance penetration[1] (OECD, 2011). Insurance density[2] is also low. Insurance is used as part of the process of managing financial risk, and insufficient insurance means there is insufficient protection against adverse financial events.

Underinsurance has been identified as a common problem across countries and can have serious consequences. For example, Bernheim, Carman, Gokhale and Kotlikoff (2003) illustrated that under-provision of life insurance is one of the most frequent causes of poverty amongst widows in the USA, while MetLife (2009) shows that most widows whose deceased spouses were underinsured had had to make substantial lifestyle adjustments. OnePath (2010) illustrates the devastating impact of inadequate life cover on the surviving spouse and children. Research in Australia has quantified the underinsurance problem there at AUD$1.37trillion (Rice Warner/TNS (2005).

Prior to this project, there is limited understanding of

the extent of underinsurance in New Zealand and how consumers determine the appropriate level of insurance to hold. The area has not been researched adequately for New Zealand and, while individual companies have carried out surveys, the ISI underinsurance project is the first research to explore this issue in New Zealand in a comprehensive quantitative manner. This study, and the related survey, provides an initial exploration of these questions, focusing on personal risk insurance. Informed public policy initiatives require knowledge of the extent, size and demographics of non- and underinsurance. This research helps to quantify and explore the extent of the underinsurance gap within New Zealand.

We examine underinsurance using a sophisticated life-cycle-planning model which incorporates a range of demographic and financial variables, using the data from a comprehensive AC Nielsen survey (commissioned by ISI) of 2000 people representing 2000 households. The comprehensive survey coverage and the methodology ensure this report is of standard which matches or exceeds the best internationally.

We follow accepted terminology for insurance adequacy and define "significant underinsurance" as being 20-40% below ideal insurance cover (set at 80% of prior consumption) and "severe underinsurance" as greater than 40% below[3] ideal cover. We look at the immediate drop in consumption post tragedy, and ignore any adjustments which could occur in the longer term.

It is important to note that adequacy does not have to equate with rationality, as couples may purchase relatively little insurance for a variety of economically plausible reasons. For example, they may choose to

1   Insurance Penetration is measured as the ratio or percentage of insurance premiums to Gross Domestic Product (GDP). International comparisons are done in US$.
2   Insurance Density is measured as the ratio of total insurance premiums (in US$) to total population. This indicates how much each inhabitant of a country spends each year for insurance services.
3   First used by Bernheim, Forni, Gokhale and Kotlikoff (1999)

place relatively little weight on a secondary earner's future well-being. This study, thus, does not examine the rationality of personal insurance purchases; instead it seeks to explore the extent of uninsured and underinsured financial vulnerability.

While some quantification of the extent of underinsurance at a national level is provided, there are limitations associated with the calculation that limit its value. Insufficient disability incidence data has limited the ability to put a precise figure on the national cost of non- or underinsurance. The existence of a comprehensive system of social welfare, and the income testing rules, mean that while increased insurance cover would benefit families, it would not necessarily benefit government finances. The study does explore the causes of personal underinsurance but discussion of policy options is left for a subsequent report.

TYPES OF INSURANCE CONTRACTS

LIFE INSURANCE

Life insurance is a contract between the policy holder and the insurer, where the insurer promises to pay a designated beneficiary a sum of money upon the death of the insured person. Depending on the contract, other events such as terminal or critical illness may also trigger payment. In return, the policy holder agrees to pay a premium at regular intervals or in lump sums. Term life provides coverage for a specified term of years and does not accumulate cash value. Permanent life remains in force until the policy matures and builds cash value. The issue of new permanent life is, however, increasingly rare in New Zealand with most policies being old.

DISABILITY INCOME INSURANCE/ INCOME PROTECTION (IP)

Income protection insurance is a form of income replacement benefit paid when a person is medically incapacitated and unable to work. Cover is set as either a fixed monthly sum or as a percentage of prior period income, usually the maximum is 75%. There is usually an initial waiting period, and then the benefits are paid until the individual is declared fit to return to work. The underwriting considerations that apply to disability insurance differ from those for life insurance due to a higher likelihood of incapacity than of early death. There are also comparatively high premiums for this cover after the onset of middle-age, and payments are off-set against welfare, so the use of this cover is restricted to middle or higher income groups. They are income linked so are not available to non-earners.

TOTAL & PERMANENT DISABILITY INSURANCE (TPD)

Total and Permanent Disability cover may provide a lump sum when an individual is considered to be so disabled as to be unlikely to ever be able to resume employment for which he or she was suited. Each policy will be different and the entitlement to a benefit will depend upon the definition of total and permanent disablement in that policy. Underwriting considerations are similar to those applying to disability income insurance, with the main concern being the likely permanency of the disability. Normally these polices do not pay out for permanent partial disability. These policies tend to have low premiums as the incidence of permanent total disability is low. They are often linked to life insurance, and arranged as an early payout of the life sum. These policies are very useful for covering the high costs which can be associated with caring for a totally disabled family member.

TRAUMA/ DREAD DISEASE INSURANCE

Also known as "critical illness", this cover pays a lump-sum on diagnosis of one of a specified range of medical conditions or accidents. It is not designed to cover the cost of treatment but to cover associated costs like rehabilitation expenses or a drop in income. Most polices only cover a limited range of the major conditions, like heart attacks, cancer, stroke, coronary artery bypass surgery, and severe injuries resulting in paraplegia, blindness or severe burns. Underwriting considerations are generally similar to those for medical insurance. These are not linked to income so are useful for non-earners as a substitute for income protection, and as a complement to ACC cover.

REASONS FOR UNDERINSURANCE

The conventional assumption is that people insure because they are risk-averse, and desire protection against the costs of low-probability, high-cost, adverse events. This implies the possibility of loss is sufficient to induce people to pay insurance premiums even though the expected mean return is negative. Insurance gives 'peace of mind' as well as allowing households to enter into transactions, like buying property, which might not otherwise occur.

Why do some people not insure? It needs to be remembered that the process of deciding on insurance and on level of cover are difficult. The prospective policyholder is being asked to pay money for an intangible and uncertain future benefit, when that money could be used in alternative ways which may have clear immediate benefits. There are a number of commonly cited reasons why non- or underinsurance occurs;

(i)   There may be information issues; because of ignorance about the risk or choices, because of a failure to actively consider the need, or because of difficulty in understanding choices. This may be particularly relevant if the insured has little to insure, perhaps due to poverty or youth, so they have little incentive to educate themselves.

(ii)   Households may believe that the government will provide sufficient financial backup. For some low income households this may be a well informed and rational choice, given the availability of government welfare. However, surveys show that most respondents who have no prior experience of welfare are unaware how low standard payment levels are and once informed tend to buy insurance.

(iii)   The transaction costs associated with delivery can increase the cost of insurance. If a rational, risk averse, insured person only had to pay a premium equal to their expected mean loss, then they could be expected, in theory, to fully insure against all risk. However insurance companies have to add the cost of marketing, administration and reasonable profit to their premiums. There can also be substantial costs imposed by government, via taxes, levies and other charges. These costs will drive a wedge between ideal cover and actual cover taken out. Given these transaction costs, insurance is not worthwhile for events which are minor in terms of their impact.
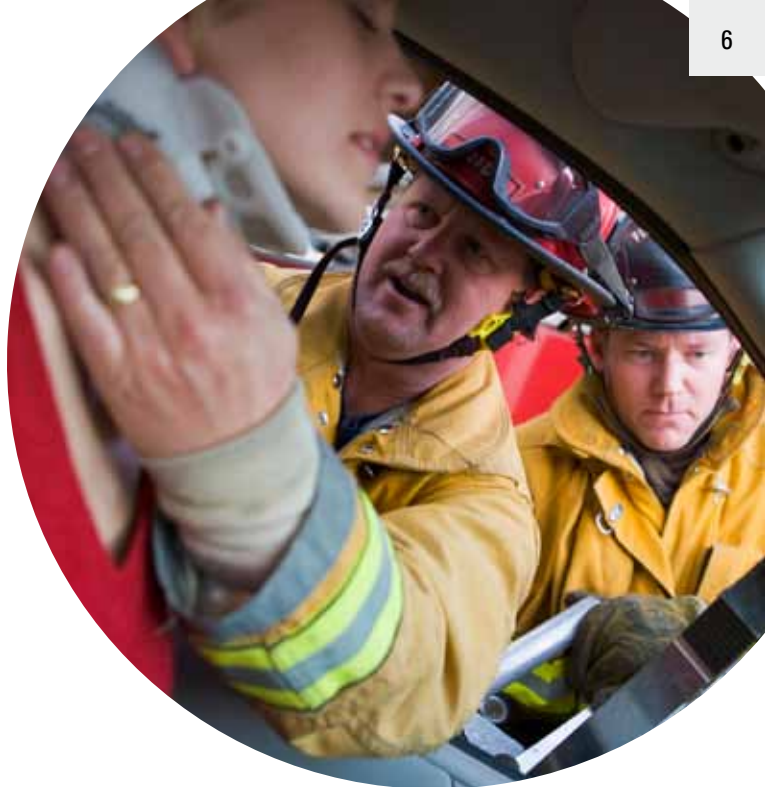
(iv)   There are two concepts that economists emphasise in relation to insurance as possible sources of inefficiency: "adverse selection" and "moral hazard". With adverse selection, "the insurer cannot determine some characteristics of the insured that are relevant to the determination of the probability of the future state of nature"[4]. Consequently, these cannot be reflected in premiums charged. Those individuals who are aware that they have higher probabilities of an adverse event are then more likely to insure (Cohen & Siegelman, 2010). With moral hazard, the insurer also cannot monitor the insured's situation, and the insured, "has the power and the incentive to change this unobservable state in response to insurance coverage"[5]. For example, those leading a less healthy lifestyle may be more likely to take out health insurance (adverse selection), and those with health insurance may be more likely to adopt an unhealthy lifestyle. These information asymmetries can result in higher premiums. These in turn will dissuade some from taking out adequate cover.

(v)   While adverse selection and moral hazard suggest inefficient insurance coverage due to imperfect information, another factor, "risk aversion" might further complicate the picture. A risk-averse individual is more likely to take out insurance against the effects of an adverse event, so that those most worried about the possibility of changes in their lifestyle insure more than those who are more willing to endure possible reductions in their standard of living. Note however that risk-averse individuals might also display other risk-

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4   Pauly, (1974), pp.44-45
5   Pauly, (1974), p.45

reducing behaviours. Hence, someone who is concerned about poor health may both take out health insurance and adopt a healthy lifestyle.

Care is needed here in the case of life insurance, however, as the person who decides on the amount of cover (if any) on their life is not the person who will suffer from their death. It is their dependants who will. It also needs to be remembered that survey respondents who claim to be relatively willing to risk the economic consequences of permanent disability do choose to insure against the far less severe risk of a minor car accident[6]. Note also there is a common misunderstanding around the relevant riskiness of the event being insured, in that it is commonly assumed that insurance is best for likely events, when it is actually best for uncommon events (due to their low premiums because of the low risk), and not as good a buy for likely events (due to their high premiums). It is the severity of the tragedy which should determine its worth, not its comparative risk. However, insurance for high probability events, while a poor buy in terms of expected returns, may be worthwhile if the insured has inadequate financial resources in the short-term to cope. Self-insurance is only possible if sufficient time has passed to allow resources to be built up.

(vi)   There could also be issues of timing and time preference. A person who discounts the future at a high rate may rationally decide against making a certain pattern of payment over time in exchange for an uncertain pattern of large payments upon the occurrence of a relatively rare event in the future. The issue with this is that life insurance protects dependants rather than the person insured, so a rational choice has to use the time discount of the dependants, who could be minors. In this case the decision maker's preferences determine the decision but that decision may not be optimal for a collective situation where individual interests differ.

(vii)   There is also the difficulty people have facing up to the idea of death or permanent disability. Frequently they avoid the issue or need it conceptualised by examples. Younger people in particular find it hard

to accept the idea that they are at risk, as they feel the chance of death is extremely remote.

(viii) There can also frequently be a perceived lack of trust in the insurance company to honour their obligation to pay out, instead citing an obscure clause in a complex contract. This feeling is particularly acute amongst migrant groups from Asia, who may have experienced inadequate service from insurance providers in their home countries.

(ix)   People may differ in their price sensitivity to insurance premiums, so that some do not consider the benefits of insurance outweigh the costs. One factor they may consider is the seriousness of non-insurance. In this sense people are likely to have lower price sensitivity to building insurance than contents insurance, given the more severe consequences. They may also be more willing to self-insure by paying a higher excess, or accepting of worse conditions. Wealthier people may be more willing to self-insure. Note the relative cheapness of life cover for younger clients versus the expense of income cover for middle-aged men. Note also that the death of the main earner is so severe that it is generally not possible to substitute for insurance by savings, until late middle age. Research[7] tends to show a weak relationship between those saying life cover is too expensive and their disposable income, indicating price sensitivity is more an issue of perspective rather than disposable income.

Increased price sensitivity to premiums should rationally express itself as a reduction in the amount of cover or an increase in excesses, not in non-insurance, since the good is not lumpy. Surveys show, however, that rather than buying a range of insurance products so all risks are covered and then adjusting the amount of cover to reduce

the premium cost, customers tend to buy one or two types and ignore the other products, not understanding that this leaves them completely exposed to the uncovered risks.

(x)   Another reason commonly cited in surveys is the complexity of personal insurance choices. However, while this is true for income protection or trauma cover, conceptually life is as easy to

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6   For example LifeBroker (2010)

7   For example AMP (2005) & Rice Warner/TNS (2005)

understand as car or house cover, yet people do buy general insurance and don't buy personal insurance. Surveys thus suggest it is more a lack of familiarity with the purchase of life cover. There are not many decisions which customers make which involve an exchange of money for a promise of this nature - a service which cannot be physically touched, a service which in all likelihood will never be received due to the low risk of most covered events for young people, with the usual outcome being a feeling of peace of mind. Surveys[8] show that better insurance decisions are made after quality advice is given, which indicates that complexity or visualisation problems do exist.

Issues may also arise if traditional insurance agents try to oversell life cover, resulting in premium levels which are not sustainable as premiums rise with age, and clients are put off subsequent insurance purchases.

These factors can interact in a complex manner. For example, underinsurance for life amongst younger couples can be partly explained by the fact that adequate life cover using future earning capacity based on an average of life-time earnings results in sums which are high in comparison to current earnings, due to the expected peaking of earnings capacity in the early 50s. Younger couples may feel they are too liquidity (cash) constrained to insure at that level, and instead use a proportion of current earnings. They may also feel they have time to adjust to adverse events. The relationship between current consumption and what is available from welfare needs to be considered, as insurance may not significantly improve the insured's living standards after allowing for rebates. This relationship can be quite complex.

An example of these factors is to consider the group who is traditionally regarded as most vulnerable - a young couple, one earner, young children, one or more pre-school, - whose insurance needs will be particularly high if the standard formula is used. However, this group is likely to be (a) liquidity (cash) constrained as they will be setting up a household so will be price

sensitive, and/or (b) may have made a rational choice to accept a lower post-tragedy life standard, relying more on social welfare, and/or (c) may have an at-home spouse who has the ability to return to work, and/or (d) has no immediate need to save for retirement or retain their house equity. They may thus be in a more flexible position financially than a seemingly richer middle-aged couple with teenage/university-age children, who have higher fixed expenses, and diminishing time to prepare for retirement.

Paff (2010) notes that AMP research shows that insured clients view trauma, TPD and income protection as too expensive. The reason given by clients is the relatively higher premium per unit than life cover. AMP argues that clients fail to recognise that these higher premiums reflect the higher frequency of payouts, with TPD claims made 50% more often than life claims, with trauma three times as frequent and income protection 31 times as frequent. When compared on a price per unit payout, premiums are not high.

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8   For example Zhou-Ricter, Browne and Gründl (2010)

Paff also argues that clients underestimate the worst case situation. They often feel that savings or family support will get them through a "bad patch". People tend to think of bad events as minor - a month off work, rather than a permanent situation. They fail to recognise that death or permanent disability of the main earner exceeds any capacity to cope they may have from savings or investments. Family support in crisis only works in general for smallish events, unless the family is exceptionally large and robust. In both cases customer education and guidance is required, especially the use of customer stories to make hard to imagine events seem more concrete.

Note also that a number of adverse events are permanent in nature, like permanent disability, which means that adjustment after a time may not be possible. If there are dependants then the better choice is to reduce sums insured rather than have no insurance, as the occurrence of a tragedy, such as the death of the main income earner, would be severe on survivors with little savings.

An important contributor to underinsurance amongst women is their higher rates of part-time work or interrupted careers. Given that traditional products were focused on full-time workers with smooth careers, more innovation and flexibility in products is needed if these clients are to be captured. Another contributor is that the value of an at-home mother is often underestimated.

These women cannot obtain income protection, and could have a low estimate for life cover. However, any health or disability crisis involving them could have strong impacts on household finances. Therefore they may require standalone trauma or TPD cover. Yet these are products with particularly low penetration rates.

Zhou-Ricter, Browne and Gründl (2010) argue that the main reason for the low demand for long-term care insurance is due to a low level of risk-perception by insured, both the exposed parents and possibly liable children. The rates of coverage rose drastically after respondents were made more fully informed, in the sense they were provided with a higher degree of information about specific risks and made to think about the consequences. This requirement for better consumer information before a wise choice can be made is common for complex products, for example a range of health inducing measures like exercise.

Chambers, Schlagenhauf and Young (2003a, 2003b) argue that life insurance premiums for younger households are actuarially too high and adjusting for this does explain some of the life underinsurance amongst younger couples. They note, however, that this still leaves husbands' lives on average underinsured compared to the assumed adequate level. They regard the reasons why husbands underinsure themselves as an unsolved puzzle. Chambers, Schlagenhauf and Young (2011) show that actual life holdings peak around age 50, whereas the present value of future income peaks near age 30. They note, however, that on an actuarially fair basis, average income households are reasonably insured over their life cycle, indicating that lower insurance when young is an issue of liquidity constraints (they have less spare cash). They also note that the non-insured are typically young and face very low mortality risk, and tend to be single. The major underinsured group is poor households with two or more children. This group has a high need for insurance cover but face extreme budget pressures so immediate products like better food or housing take priority over a product which customers feel can be left at this stage in life. It needs to be noted that the US situation differs from New Zealand, as for low income groups in New Zealand insurance may not provide much benefit above that which is available from social welfare.

Kunreuther (1984) examined US choices relating to natural disaster insurance and found that respondents do not engage in a detailed cost-benefit analysis and instead rely on past experiences, protecting themselves against a specific hazard only if they feel the hazard is a serious problem, (the "availability heuristic"[9]). Kunreuther argues household judgement is often faulty, with the vast majority possessing no reliable knowledge of the probability or cost of a hazard or of the policies available. They tended to only insure if they or a close acquaintance experienced the hazard. Most had trouble understanding basic concepts of probability. Fier and Carson (2009) found that the occurrence of natural catastrophes had a significant positive relationship on subsequent demand for both general and life insurance, even though few lives were lost.

Akerlof and Dickens (1982) argue that many people avoid taking out insurance because this involves thinking about unpleasant consequences, and they prefer to avoid confronting the hazards by believing the hazards do not apply to them[10]. Kunreuther (1984) argues that because of this improving people's awareness of risk via correct information does not tend to work in practice, indicating that other factors, like avoidance of unpleasantness, are influential, and need to be considered in any efforts aimed at reducing underinsurance. Mitchel (2003) found that whilst 90% of respondents who regarded their life cover as inadequate state they intend to buy more life cover in the next 12 months, only 1/3 of these actually will. Most of the rest procrastinate trying to avoid thinking about the issue, or worrying about the complexity, or possible cost, without actually finding out the true cost or seeking advice.

Rice Warner/TNS (2005) surveyed 600 families with dependent children and found that while respondents regarded life insurance as important, there was a strong tendency for respondents to regard life insurance as too expensive and to regard insurance companies as not to be trusted. There was an inverse relationship between respondents who held those views and their level of life cover. They also found a tendency for respondents to consider or take out policies only when major life events occur, like starting a family or obtaining a new job.

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9   See also p.89 of Kunreuther & Useem (2010).
10   McGuire, Henderson and Mooney (1988) refer to a concept, 'process utility', whereby disutility can arise from the process of having to make decisions where an adverse outcome is possible.

ING (2008) surveyed 1,000 representative Australians and found that 89% of those surveyed said they were unlikely to have an accident, 80% said they were unlikely to have a serious illness, and 83% said they were unlikely to die, in the next 20 years. These are well below the actual incidence of these adverse events. They found that 81% of respondents thought that life insurance was too expensive, yet 61% of respondents overestimated what premiums for their situation would be. They found that 41% of respondents thought that life insurance is too complicated, with 25% not knowing how to apply. They also found that 63% of those with a partner had not discussed life insurance with their partner, finding it too unpleasant or difficult. Of those who had no cover, or were aware they had inadequate cover, 49% were unsure how they would cope after a tragedy but felt confident they would find a way to manage, 12% had a partner who could return to work, 13% had substantial savings and 6% would rely on the extended family. Of those aged between 55 and 65, 48% regarded themselves as too old for life cover. Of uninsured parents with children over 12, 34% regarded life cover as only for rich people. Of those without life cover 97% said they were focusing on growing their assets and 53% regarded other financial commitments as more important. However, 63% of these respondents included their superannuation holdings as part of the wealth they were accumulating, unaware there are hurdles for a surviving spouse to obtain this. Of the respondents without life cover, 81% regarded it as too expensive, 48% as too complicated, 21% as too unpleasant to discuss with their partner, and 62% regarded life cover as 'nice to have' or 'unnecessary' rather than essential. The non-insured also tended to over-estimate the cost of premiums, with a third estimating at twice actual premiums. Of the non-insured for life cover, 60% worry that there would be complex bureaucracy if their survivors claimed, with 44% concerned the company would rely on obscure clauses to deny payment. Interestingly, 92% of respondents regarded car insurance as essential, and 88% for house insurance, indicating that respondents had never seriously considered the financial consequences of death or long-term illness/disability.

Sweeny (2008), found that 51% of Australian respondents reported trouble understanding insurance documents, 49% found it difficult to work out the amount of cover

required, 45% found it difficult to find good independent advice and 45% found the process overwhelming.

Cigna (2011) found 29% of New Zealand respondents quite unlikely to approach an insurance adviser, and 44% agreed or strongly agreed that insurance companies were untrustworthy.

Rabobank (2009) surveyed 1,000 representative New Zealanders and found that 69% of life insurance customers would recommend their insurer to a friend, versus 81% of general insurance clients, 81% of banks and 62% of financial adviser clients. Only 35% of life clients and 12% of non-life customers had financial faith in life insurers. Only 45% of those surveyed agreed that life insurers provided good products and services, 54% that they had financial strength, 42% that they acted fairly with integrity, 54% that they provide good information and 52% felt confident that their claims would be honoured. This compares to 71%, 68%, 58%, 69%, 69% and 68% for general insurers. This indicates that NZ life insurers are not doing a good job of retaining the faith of their customers, and have a very low standing with non-customers.

Cost is an issue in New Zealand as the major source of new business for insurers is brokers, and the standard initial commission can be 200% of first year premiums. Given that over half of all polices do not last more than 7 years, insurers have to add a high cost of sales charge to premiums. A change to the commission structure would be beneficial.

The trust issue impacts on initial sales via an agent or broker. Estimates of correct levels of cover can only be ascertained from a detailed analysis of household finances. Clients are uneasy about releasing this information to an agent they do not trust. This is particularly the case where they feel the agent's main interest is in maximising sales. Recommended levels of cover are often excessive, with a correspondingly high premium, which leads to clients rejecting the advice or cancelling cover within a short time. It also needs to be noted that traditionally insurance agents have been male and have had a lot more success with male clients. This is partly to do with the intimacy of some of the required underwriting questions. An additional factor is the greater complexity of health underwriting for women. Given that underinsurance is more acute for policies benefitting females (single females or on the lives of husbands) differing sales approaches or staff may be needed. Insurance provided by trusted financial advisers has been shown to be at more appropriate levels.

AMP (2005) surveyed 500 parents with children and found that while 90% of those with life cover regarded it as adequate, only 31% had a level of cover which exceeded their mortgage and debts, leaving the rest to replace the deceased's income or rely on welfare. This result indicates that a large section of life cover in NZ is tied to bank mortgage requirements, even if it is arranged via a broker, and having obtained this, couples do not go on to consider their other consumption needs. Of those with adequate cover, 40% found insurers easy to deal with whilst only 22% of underinsured and 15% of non-insured did. Only about 15% of all groups thought that insurance companies were the only ones to gain from insurance. Of the underinsured 26% will reconsider when they are older, as will 30% of the non-insured. Of the underinsured, 10% thought that life cover was just for the rich, while 22% of the non-insured thought this. Only 45% of those with insurance have amended it as personal circumstances changed. Of those who have never held insurance 47% cite costs, 45% are considering, 29% have never thought about it, and 23% find it too confusing. Only 5% think the government will provide. Of those who have held life cover in the past but no longer do, 40% dropped it because of the cost and 16% because of negative experiences with the insurer.

Genworth (2011), in a series of linked polls, surveyed via phone, email and online, 26,000 Americans who were selected to represent the 70% of US households with US$50–250,000 income. They found that only 1/3 of respondents had reviewed their life cover in the last 10 years, with most only reviewing cover at trigger events like marriage or birth of a child. The survey found there was, however, significant inertia in decision making with a gap between the trigger event and purchase of additional cover ranging from 6 months after obtaining a new job, to 10.5 months after birth of a baby, to 13.5 months after marriage, to 20 months after a natural disaster. There was also a gender gap in what events were regarded as a trigger, with men citing marriage, and reaching a significant age as the top two reasons, and women citing birth of a child and job change. Most respondents felt that old-school insurance agent

techniques were inappropriate; such as coverage needs calculated as a simple multiple of income, with most expecting a more personalised approach. It was regarded as important that a needs analysis was flexible with the ability to adjust assumptions downwards until premiums were reasonable rather than an all-or-nothing choice offered. There was an increasing willingness to accept and use online education and needs analysis tools, with 56% of the 36-54 age group expecting an online calculator and product comparison. Respondents expected life products to be flexible, able to respond to changing needs, and be purchased incrementally. The survey found that 73% of respondents who received a detailed needs analysis went on to purchase additional cover, versus 49% of those who did not.

THE EXTENT OF NEW ZEALAND UNDERINSURANCE

This report and the associated AC Nielsen survey are the most comprehensive reviews ever conducted within New Zealand and the only to use international standard methodology. Prior research of underinsurance in New Zealand has been limited to surveys conducted by private insurers. International research is covered in the appendix, and has been mainly concerned with health, life and general insurance, with no research having been done internationally on disability products. Only a few international studies, outside the USA, have used comprehensive life-cycle methodology.

New Zealand has one of the lowest rates of insurance density and penetration in the OECD. Figures for 2008, in Table A–5 in Appendix Five, show NZ has an overall density of 719, compared to Australia at 2742, the US at 4935 and the UK at 6398. Our density is on a par with less financially developed ex-Eastern bloc countries like Hungary, or lower income countries like Portugal. The life densities, in Table A-5 show a similar ranking, as do the insurance penetration rankings in Table A-6.

Whilst these comparisons indicate strongly that New Zealand is heavily underinsured, the figures can be inaccurate and need to be treated with caution, as they (i) use gross premiums, rather than net, (ii) include premiums related to insurance-linked investments (which are uncommon in NZ) as well as pure life, (iii) can be subject to exchange rate fluctuation, (iv) do not relate to measures of insurance need, (v) do not adjust for differing premium costs, (vi) are proportionate to

GDP, and (vii) do not adjust for the way differing state-provided welfare schemes impact on private need for insurance. Issue (i) is important as the extent of premium inflows to a country due to the existence of head offices or reinsurance, or a corresponding outflow, distort figures, and make density and penetration inaccurate measures of underinsurance. This is reflected in the extraordinary high density of Luxembourg. These rates are thus proxies for development of the insurance industry. Issue (iv) is important as a country may have a lower comparable level of insurance need due to factors like a high level of asset holdings, a high proportion of the population in low need groups (e.g.; elderly) or a culture of group dependency.

These factors mean that the level of underinsurance can only be realistically measured by a more detailed examination of needs. There are two main methods of doing this. The first method is by surveys of a representative sample of a population, which provides the required financial information. This gives the most accurate estimate of underinsurance for those sampled, but can only give an accurate estimate of national underinsurance if the sample is representative enough so it can be scaled up to the national population. The second method is extraction of data from national samples, like censuses. These provide a superior ability to scale to a national level, but do not generally provide sufficiently detailed financial information to generate accurate estimates of representative underinsurance.

Research in underinsurance in New Zealand prior to this study has been restricted to industry surveys.

Cigna (2011) found that 36.4% of the New Zealanders they surveyed had no life insurance, with 49% of those who did have cover regarding their level of cover as adequate. However, this was a very restricted, small sample survey, using non-randomised respondents linked to their existing client base.

AMP (2005) surveyed 500 New Zealanders online, and found that 55% held life cover. Of these only 31% had coverage exceeding 5 years income and 40% had cover less than an arbitrarily defined level of 5 times the median national income ($40,000) or $200,000. Income protection and mortgage protection were both held by 23%, while only 18% held trauma cover and 14% held TPD. Very few had made any changes to the policies they held or the level of cover as household composition or income changed, and 90% of those with life cover felt they were well covered. Unlike the results for Australia there was a positive relationship between life coverage and income, with those with no cover having an average income of $32,709, those with inadequate cover $35,934 and those with adequate cover $56,394. This either indicates a reliance on welfare amongst the lower income respondents, or liquidity constraints or is an artifice of the adequacy definitions. Those with

adequate cover tend to be male, Pakeha, aged 31-45, own houses with mortgages, have a personal income of $40k to $80k with a household income over $80k, higher debts of $100k-$250k and in a two parent family. Those with inadequate life cover tend to be female, Pakeha, aged under 30 years, personal income under $40k, total debts under $20k and in two parent families. Similarly, those with no life cover tend to be female, aged under 30, Aucklanders, in rental property, personal income under $40k and in two parent families.

THE ADEQUACY OF INSURANCE COVERAGE

It is normal within the insurance industry to define adequate life insurance cover by using some multiple of income. For example, Rice Warner/TNS (2005) defines adequate cover as more than ten years household income. However, this is conceptually indefensible as household dependency on a worker's income will vary widely, depending on factors such as the number and age of children, the relative income gap between a couple, the level of investment assets including extent of house equity, level of costs, level of welfare available, etc. Insurance adequacy has to be defined as the financial vulnerability of a household to the loss of income, once the above factors are considered, and thus requires a sophisticated interactive modelling approach.

Bashshur, Smith and Stiles (1993) introduce a conceptual framework for underinsurance which is revised by Blewett, Ward and Beebe (2006). They point out that, while non-insurance is easy to define, major methodological issues have hindered research into underinsurance, predominately the fact that underinsurance is by nature relative to how "adequate insurance" is defined. They defined "full coverage" as insurance coverage which provides complete protection against all out-of-pocket expenses outside of premiums. This includes elements of both economic costs and scope of cover. They define "adequate coverage" as a less comprehensive set of benefits whereby the insured is liable for designated amounts of out-of-pocket payments, in areas like deductibles, co-payments, exclusions or limits of coverage. They defined "underinsurance" as one or more conditions where: (i) too few conditions are covered or coverage is inadequate; (ii) amounts of out-of-pocket expenses, with or without regard to family income, are excessive;

(iii) coverage is perceived as inadequate; or (iv) some combination is present. They argue that adequate coverage is a better benchmark comparison as full coverage will typically involve premiums which are excessive for most household income levels. Bashshur et al's (1993) definitions have been criticised as not taking account of factors like cultural differences. Note also that for an economic assessment, desired levels of coverage could be expected to depend in part on the level of premiums compared to income.

Bashshur et al (1993) divide the level of adequacy into three characteristics; (i) economic – the adequacy in terms of out-of-pocket expenses and insured's ability to pay; (ii) structural – whether the scope of coverage provided is commensurate with a pre-defined benchmark; and, (iii) attitudinal – the adequacy of coverage in terms of the attitudes of the insured person in terms of perception of unmet needs or satisfaction with coverage. An implicit assumption with the latter is that insurance is purchased to bridge a gap between the perceived needs of the insured and services available, and thus underinsurance in an attitudinal sense means that this gap is not adequately closed for that person.

Blewett et al (2006) argue that there are two main limitations with calculating the economic dimension: determination of appropriate level of out-of-pocket expenses and definition of a necessary level of cover. The first limitation relates to defining the ability to meet out-of-pocket expenses. If a threshold level is set, say $2,000, then this will impact differently on a household earning $20,000 than on one earning $120,000. Abraham et al (2010) argue that moral hazard also distorts threshold measures and makes them inaccurate as out-of-pocket expenses are positively related to benefit coverage. If a percentage level is set for out-of-pocket expenses, say 10%, then a household earning $20,000 may find $2,000 more difficult to pay, than a household earning $120,000 would find $12,000. The second limitation relates to the implicit assumption that there is a consensus regarding what benefits are necessary within an insurance policy, when in fact this will vary across households depending on household factors like income, composition, risk-aversion or ethnicity. Blewett et al (2006) find three main limitations with calculating the structural dimension: (i) issues around the determination of what constitutes an adequate policy package; (ii) issues around changes in solutions to events; and, (iii) issues around adequacy of

access to solutions. Note that there is also an issue with defining terms like "ability to pay" as this will vary with the comparative size of premiums to surplus income and how much the insured values economic security.

Blewett et al (2006) argue that the limitations with calculating the attitudinal dimension relate to: (i) inaccurate assessments by the insured of the risks they are exposed to; and, (ii) inaccurate assessments of the effectiveness of solutions covered by policies. This suggests research needs to index measurements of perceived unmet needs, and to weight measurements of satisfaction. There can also be a need to adjust for incorrect information or perceptions of risks faced or policy coverage. Ward (2006) argues that the first two dimensions should be combined, as excessive self-payment is analogous to inadequate conditions and both are determined relative to an external benchmark, and that the attitudinal dimension can only be used when referenced to a rational benchmark, because the insured may exhibit confused or irrational responses to policy coverage.

Bernheim, Forni, Gokhale and Kotlikoff (1999) were the first to systematically survey life insurance adequacy. They use a formal life cycle model to evaluate needs, which includes a broad array of demographic, economic and financial characteristics. They regard the level of life insurance cover to be adequate if it allows an individual or their children to sustain their living standard upon the death of a spouse. This coverage level cannot be generalised as the calculation has to take account of critical factors such as numbers and ages of dependent children, economies of shared living, liquidity constraints, one-off household expenditures, access to welfare payments, non-fungibility of housing and opportunities for other adjustments over time (change of life course, new career, relocation, repartnering, etc). This is the basic approach which this study follows.

MODELLING DEMAND FOR INSURANCE COVER

Demand for insurance is influenced by both micro- and macro-level factors. Studies have looked at these separately, considering either data on individuals or aggregate data across countries.

Numerous studies have examined which micro-factors influence demand for insurance by insured. Zietz

(2003) summarised these and found that the major determinants were; (i) degree of risk aversion; (ii) level of loadings and deductibles; (iii) level of wealth; and, (iv) bequest motives.

Fortune (1973) and Klein (1975) established the basic model of optimal life insurance, based on expected utility under uncertainty, and argues that net life insurance depends positively on wage income and negatively on the discount rate and non-wage income. Brown and Kim (1993) analysed macro-factors which influence demand for life insurance in 45 countries. They found that national income, number of dependants, level of education, and the level of pension entitlements are all positively related, premium price and being in a Muslim country are negatively related, while life expectancy was unrelated (arguably because the insured cannot accurately make an estimate).

EVALUATING LIFE INSURANCE NEEDS

This study explores two key outputs. The first is the proportion of households which are non- or underinsured; the second is the extent of this underinsurance. The latter is estimated by the percentage difference in achievable household consumption between what is defined as adequate insurance cover and the level of actual insurance cover held.

The starting point in evaluating whether respondents are underinsured is to model what adequate insurance would look like. The traditional approach used by insurance salespeople was to use a rule of thumb, normally an arbitrary multiple of current income. This has been the approach used in most of the surveys mentioned previously. Gokhale and Kotlikoff (2002) illustrate that these traditional approaches fail to provide useful solutions as individual circumstances vary too much.

This study defines "adequate coverage" for income protection as the industry standard figure of 75% of pre-tragedy net consumption. Note that this will clearly be inadequate if the disabled person has higher than normal consumption or healthcare needs. However, insurance is not normally available for more than 75% so using a higher figure is not appropriate as a measure of underinsurance. Adequate cover for trauma is taken as the greater of $50,000 or six months income, as statistics indicate 90% of injured or sick workers have

returned to work within this time frame. Note, however, that some of these workers may not return at the same pay rate, so extra cover may be needed. Consequently, income protection and trauma should be regarded as complements, not substitutes.

Adequacy for life insurance and TPD is more complex. An example of this is a couple with no dependants where both are working, but they have highly unequal earnings. Some higher earners may feel an obligation to ensure the lower earner continues to receive their pre-tragedy lifestyle, whereas others may not. This feeling may be stronger in long married mature couples with adult children than in younger couples. For simplicity we have ignored these issues and assumed post-tragedy life style is maintained at least at 60% of prior joint consumption.

There are two approaches to estimating life insurance cover. The first approach is simply to estimate the present value of future income earned by the insured person and insure for a set proportion of that, say 80%. This generates an easily understood sum which relates directly to what is lost by the death of the insured. It can also be approximated by multiples of current income related to age, which was useful in the pre-computer age and was called the Multiple of Income approach. The problem is that no account is taken of the actual needs of dependants or changes which may reasonably be expected to occur in the future.

The second approach is to estimate the present value of the gap between the actual needs of dependants and their ability to earn an income. This is more flexible as it allows dependants to respond to events by measures like re-entering the workforce. This is the approach we will use and is the normal approach used in life underinsurance research. This is called the "economic approach", and argues that life insurance cover is defined to be "adequate" if it allows an individual and/or their children to sustain their living standard upon the death of a spouse.

The basic model underlying this approach is the standard life cycle model[11] with certainty, whereby households are assumed to use an estimate of their expected lifetime income from all sources to smooth their annual consumption until an assumed age of death. Note that estimates of adequate insurance cover are made using

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11   Ando and Miller (1963)

net consumption rather than earned income. Adequate coverage for TPD is assumed the same as for life. Note the need for consumption after death has been adjusted for reduced household size.

Browning and Lusardi (1996) point out "broadly, agents should save so that consumption in retirement gives the same marginal utility as consumption earlier in the life cycle (with due allowance for any discounting). Note that this does not imply that consumption levels should be smoothed over time; fairly obviously households may "rationally" plan to spend more when there are children present and less when they are not working in the market (that is, after retirement). Additionally, declining health or vigour in older age may lead to planned (or anticipated) falls in consumption over the life cycle".

FIGURE 1: INSURANCE NEEDS OVER A LIFE CYCLE
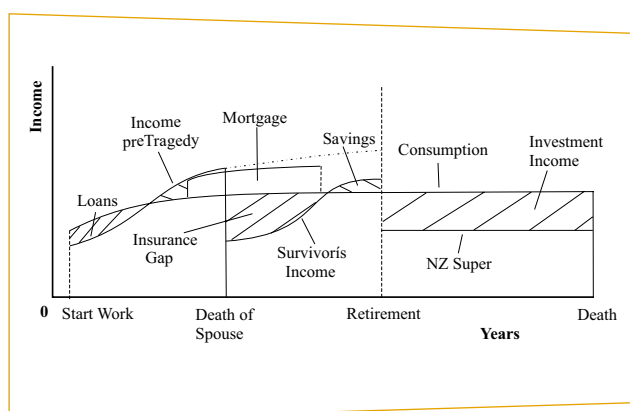
An implication of this model is that insurance needs will decrease as the earning members of a household age, due to declining cumulative future expected income. Recommended insurance cover rises monotonically, and more than proportionally with annual household income, due to the diminishing relative proportion of social welfare payments to income. There is a positive relationship between recommended insurance cover and the extent of asymmetry between incomes between couples in a household, due to the lower earning spouse finding it harder to replace the higher earning spouse's income as the gap rises. Recommended cover is positively related to estimated earnings growth and rates of return, due to the impact of these on estimated human capital. These effects are larger for younger earners.

LIFE COVER MODEL

Our life cover model makes a number of assumptions. The death is assumed to occur immediately. The surviving spouse is assumed to work until age 65 and to maintain a steady level of consumption until death at age 90. There are no bequests and no work after retirement. Income is smoothed until the survivor's death, so a retirement sum is included within the life insurance sum. A life sum not including retirement needs is also provided. Children remain household members until, and including, age 18. They are treated as self-sufficient adults after that. No adjustment is made for the costs of tertiary education as a post-tragedy household is assumed to utilise student loans. Given that there are often costs associated with children after 18 this assumption implies a downward bias in life sums. Other adults are only included if they are dependent. The survivor does not remarry. No specific sum is put aside for repaying mortgage or other debts, as the cost of this is included via the continuance of existing living standard. Whether it is optimal for individual households to use the insurance lump-sum to repay debt or for investment is not examined. Future consumption is discounted for time at 5% real.

The survey used to provide the data followed the industry convention of gathering income in eleven standard groupings, rather than exact figures[12]. We assumed the income of respondents was at the midpoint of each bracket and adjusted for tax and ACC to get net income for each grouping. Note that the average household income in NZ in 2008 was $67,000. Tax rates as of 1st April 2011 on gross income were 10.5% on incomes below $14,000 17.5% between $14,001 and $48,000, 30% between $48,001 and $70,000, and 33% above that, on both earned and investment income. ACC is levied at 2.04% of gross income. A contribution to Kiwisaver of 2% of gross wages is assumed. Employer's contributions are not included as income. No modelling was done on use of the insurance proceeds in terms of how it was invested and associated taxation treatment, apart from assuming that mortgage debt was repaid if possible. Analysis of Working For Families' tax credits was simplified due to its propensity to multiply complexity, by assuming that families accurately recorded their entitlements when asked to as part of recorded income. This is adjusted as a fixed percentage after the tragedy. If survey data was inaccurately recorded then there will be an upward bias

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12 Survey industry experience is that asking for exact income tends to produce non-response or inaccurate figures, whereas respondents do respond to grouping. Respondents over $200k were assigned $300k.

in recorded underinsurance as Working For Families' tax credit entitlements could substantially rise post-tragedy.

Actual insurance cover will depend on estimated consumption needs of the household. When calculating household need for insurance coverage we need to adjust for two factors: (a) the difference between earned net income and consumption, due to savings; and, (b) the reduced need for household consumption due to the loss of a non-dependent adult. Savings after tragedy are adjusted to reflect the lower earnings of the survivor, as any savings which would have been made by the deceased earner are capitalised within the life sum.

Savings are assumed to be consistent with a life-cycle model with certainty, so consumption is smooth[13], and at a level consistent with research[14] on non-house savings

for their income deciles. Standard savings rates were applied to each income grouping, so that household consumption post-tragedy is after-savings earnings. There was assumed to be no significant difference between the savings rates of insured and non-insured households, as no differentiated data was available.

We adjust for reduced household consumption due to the death of an adult by using the NZ standard revised Jensen scale[15] (RJS) which divides annual household income by the household's rating on the RJS. RJS is calculated using:

$$\text{Jensen Equivalised Annual Household Income} = \frac{\text{Annual Household Income}}{\text{Jensen Rating}}$$

$$\text{where} \quad \text{Jensen Rating} = \frac{[a + xc + yt]^2}{2^z}$$

and
- a = number of adults in household
- c = number of children in household
- t = total age of children in household
- x, y, z are constants (0.460697, 0.0283848, 0.621488)[16].

However, due to complexity we did not adjust for age of children, so we used the modified Jensen scale where all children are assumed to have an age at the mid-point of 9.5, so;

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13 Moore & Mitchell (1997) showed that when life expectancy is uncertain consumption will tend to rise until retirement and then fall subsequently.
14 Scobie & Henderson (2009), Scobie, Gibson & Trinh (2004), Gibson & Scobie (2001). Note that the lower 4 deciles do not save on a net basis as NZ Superannuation is set at a level which preserves or improves their level of consumption.
15 Jensen, (1988).
16 Constant value norms as advised by Statistics department.

$$\text{Jensen Modified Rating} = \frac{[a + uc]^2}{2^z}$$

$$\text{where } u = (x + 9.5y) = 0.7303526$$

The Jensen scaling reflects standard thinking that two adults living in the same household does not cost twice what one adult would and that children are cheaper than adults, but costs increase with the age of each child. This is scaled so a 2 adult 0 child household has a Jensen rating of 1.0. A 2 adult 1 child household has a Jensen rating of 1.2134, a 2 adult 2 child household has a rating of 1.4604, and a 1 adult 2 child has a rating of 1.13750.

Note that it is normal in international insurance studies to provide equivalency between households using $(N + \beta K)^\alpha C$, where N is the number of adults, K the number of children and C is consumption. The coefficient β reflects an adult equivalency scale, and implies the addition of a child has the same effect on standard of living as β additional adults. The normal value of β is 0.5[17]. The exponent α captures economies of scale in shared living and is normally set at 0.667. Going from a 2 adult 2 child household to a 1 adult 2 child household cuts consumption to 76.3%. Since results are similar we used the Jensen scale.

We used the Jensen scale as a guide and adjusted the required consumption after the death of a non-dependent adult, e.g. going from 2 adult 2 child to 1 adult 2 child cuts consumption to 77.9% of pre-tragedy consumption, going from 2 adult 3 child to 1 adult 3 child cuts consumption to 84.4%, going from 2 adult 2 child to 1 adult cuts consumption to 46%. We do this by assuming the surviving spouse needs 60% of pre-tragedy income with an additional 20% for children, which reduces proportionally as each child becomes independent, which gives a maximum replacement net consumption of 80%. Note that 80% is normally the maximum life sum available, while the insurance standard assumes a need for 75% of pre-tragedy net income. In single parent families we assume the children need only 40% of the deceased parent's income, as relatives or government are expected to take care of children. However, those relatives will need a lump-sum to supplement income or pay increased housing or rent requirements. No consideration or adjustment is made for the death of a child or an adult dependant, as it is not normal industry practice to include this in needs calculations.

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17 The OECD uses values for α and β of 0.7 and 0.5 (see Ringen, 1991).

Note that care needs to be taken when using equivalence measures, like the Jensen scale, as these measures attempt to identify the relative income required for two different households to have the same standard of living. This is not the same as the income required for one household to go through a change and stay at the same standard of living. There could be adjustments needed if, say, the required home is of a different size. In other words, the equivalence measure is comparative static, so there are relevant dynamic aspects that are overlooked. This may introduce a small bias as it ignores rigidities or transitions to different situations.

Using equivalence measures in this context also requires a value judgement that there should be no change in the standard of living arising from (say) the death of a spouse. Imagine that one spouse's main contribution is as an income earner. A finding of "no underinsurance" is then based on the assumption that there are no financial implications from the absence of that person. This assumption can be problematic and have an impact on the couple's relationship (hence perhaps an unwillingness to insure to that level). Imagine cases (a) where someone happens to die so others benefit from the life insurance, (b) where benefit payments are such that a household is better off if an unemployed member leaves the household (e.g. the DPB), or (c) where an earner could be excluded from a household and required to contribute so the remaining members are financially no worse off (relationship property and child support, etc.). In each of these examples, relationships can be affected because the effects of an event are influenced by the policies in place.

Housing expenditure is complex as the stream of housing expenditure does not correspond, even vaguely, to the stream of housing services, and housing is a lumpy decision involving significant costs, so most households prefer to remain in their existing house after a tragedy. It would thus be preferable to treat housing as special expenditure, rather than regular, so that we end up with residual income. However, we did not have this breakdown in our data, so we have not separated out housing costs.

There will also be one-off expenditures after the death of a spouse, for example: funeral costs; university fees; children's wedding costs; as well as additional life insurance to ensure dependants have sufficient
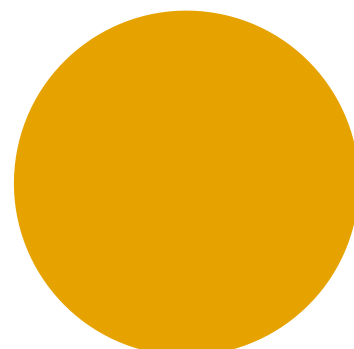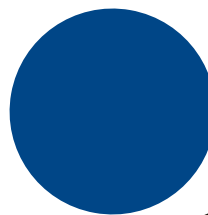
resources if the remaining spouse dies. However, it is inappropriate to assume households want to smooth these expenditures, so they are not included in equivalency scales. We instead assume a set need for $12,000 to cover funeral and associated costs.

There are also issues with the death of a non-earning spouse, so they will have been providing services, like childcare or cooking, which now have to be purchased. Therefore ideally an earning spouse should insure the life of a non-earning spouse. However, as there is no recorded income, life cover has to be based on assumed future earnings and income protection cover cannot be purchased. In these cases it is industry practice to use a higher level of trauma insurance as an inadequate substitute.

We then calculate the gap between pre-tragedy consumption and post-tragedy net earned income. We then deduct the maximum net welfare payments and tax credits, and calculate the financial impact of the tragedy on the household.

We assume the surviving spouse, if earning, continues to receive their declared income. If not earning we assume they return to the workplace part-time at 40% of the median wage ($32,500 gross), when the youngest child is aged six, and work full-time when the youngest is aged eighteen. We assume that future earnings grow at a 1% real rate (net of inflation) which is based on an average of GDP growth taken over the 2000-2010 period. Non-house investments earn a real return of 4%. After retirement 3% is extracted annually for spending so the investment sum grows by 1% every year. New Zealand Superannuation is assumed to be available at age 65. The current single rate of $17,648 is assumed to be increased annually by 1% real. It is arguable that this creates an overestimate of insurance needs, as the life-cycle model assumes a degree of dis-savings with age. This, however, is only true if there is certainty around the age of death, or if products with certain annual flows like annuities are available. Given that health needs rise with age, our assumption may imply reduced real consumption. We also ignore any additional private superannuation as we had no data on this, and it is not widely used in New Zealand, outside the civil service. Kiwisaver entitlements are similarly ignored as levels of income provided are, as yet, comparatively low. These assumptions may impose an overestimate on life sums. As a check we also calculate a life sum to retirement

with no provision above the living standard available from NZ superannuation.

We assume that the households have unrestricted access to any social welfare benefits or ACC payments they are eligible for and that normal income/asset testing rules apply. Similarly, normal changes in income tax and ACC levies are included. As of April 1st 2011, the domestic purposes/widow's benefit paid $16,995 gross per year or $326.82 per week ($288.47 net at M tax rate). An extra $20/week can be earned if childcare is involved making the gross $18,035. This is rebated at 30% for any gross income earned between $5,201 and $10,400 and at 70% over that. There is an unsupported orphan's benefit of $8,446 net p/a per child. We ignored changes in this benefit with age of the child. These benefits and rebate levels are assumed to grow at 1% in real terms, in line with consumption growth.

Note that we do not view our calculations as providing a perfect measure of the amount of insurance required to provide a stable post-tragedy lifestyle; instead it merely gives a reasonable benchmark of financial vulnerability. It needs to be noted that we have left out uncertainties relating to future expenditures, such as non-insured health costs, as well as changes in marital status, uncertainty in labour earnings or unexpected health expenditures. The first of these would increase financial vulnerability, while the impact of the others is uncertain. It also needs to be noted that medical insurance adequacy is sensitive to moral hazard; whereby more generous policies induce higher health expenditure (Abraham, DeLeire & Royalty, 2010).

As an aid to understanding the model two examples of the calculation of the level of ideal insurance are included in Appendix Three. Ideal insurance cover for a range of household scenarios is outlined in Appendix Two. A sensitivity analysis which tests the robustness of the assumptions is also included in Appendix Two.

DATA

The analysis that follows is based on an on-line survey of 2,000 people carried out by AC Nielsen in June/July 2011. This asked 67 detailed questions about household characteristics, finances, insurance held and attitudes to insurance. 175 respondents did not provide sufficient data on their income to allow their answers to be useful. The remaining 1825 respondents from a national total

of 1.3 million households imply a sampling error of less than ±2%. When sub-samples are used this may increase to ±3%. Note that the results are subject to the qualifications listed below.

While the ISI survey is comprehensive and robust, it is important to note that the survey was not designed as a survey of the general New Zealand population, but as a survey of those households with an obvious need for personal insurance. Those under 18 and over 65 were screened out. Our discussion should thus be understood as related to middle and upper family household sections of society. Over-sampling was done for Maori, Pasifika and Asian segments of the population to increase the significance of their results.

It is important to note that not all those with insurance provided information on the actual amount of insurance held, with many reporting they did not know the level of insurance they held, or provided inconsistent data. These were excluded as required, thus the total number of respondents can vary between questions.

These data will be subject to a number of biases. "Sampling error" is a measure of the variability which we expect to see in an estimate taken from repeated sampling of the same population. Sampling error can be quantified as a function of sample size relative to population and survey design. Because of the high quality of the survey design and the size of the sample, sampling error is estimated to be low.

Bias can result for a number of reasons though it can be minimised with good survey design and minimisation of non-response. Bias can arise if a sample has different characteristics from the general population, called "coverage error". Care was taken to match the sample with general population characteristics within our selected segment of society.

Potential respondents without access to on-line surveys were excluded, as were those who were unwilling to answer detailed questions about household finances. These biases are not a problem if the resulting sample is weighted so as to match the corresponding sections of the general population.

There can also be bias if respondents misunderstood or incorrectly answered questions, called "measurement error", or if those who did not respond to questions have different characteristics to those who did respond, called "non-response error".

RESULTS

Since the assumptions used in our insurance model can rationally vary, and there is commonly inertia in adjusting insurance cover to life changes, there is no identifiable problem if the actual cover of respondents do not closely match their calculated ideal cover. Our model is, however, conservative so that levels of actual cover which are substantially below ideal cover will imply substantial falls in household net consumption post tragedy.

We are thus justified in defining "underinsured" for life as more than 20% below the level of cover defined above, and "severely underinsured" more than 40% below the defined level of cover. This ties in with US studies. A household after the death of one member will have lower needs, so we define a requirement of 60% for the surviving spouse and up to 20% for children to maintain living standards. While a household with a disabled person could be argued as having a higher need for consumption than pre-tragedy income, income protection insurance is not available at more than a 75% level. While the level of TPD cover is generally set at the same as life, because the products are commonly sold as a combination, we define a higher level of TPD than life for lower income insured. Given these definitions "underinsured" implies 64% or less of pre-tragedy net consumption, and "severely underinsured" implies 48% or less of pre-tragedy net consumption. Since these are after tax and savings, these imply very substantial reductions in household consumption.

Note that the level of ideal cover depends on factors such as number and age of dependants, asymmetry in earnings between the couples, level of investment assets, and difference between the level of current consumption and what is available on welfare. These factors will have non-linear impacts.

Life insurance is held by at least 40% of all income levels, and on average most income groups are underinsured. The higher income groups generally have less adequate life insurance.

Table 1: Underinsurance for life insurance by income level

	(1) Proportion insured	(2) Proportion with no insurance[18]	(3) Average underinsurance		(4) Proportion with inadequate insurance on Life [19]	(5) Proportion that is severely underinsured on Life [20]
			Life 1	Life 2		
$5000 or less[21] (N1[22]=493/N2[23] =181)	56.8%[24]	38.5%	[25]$159,570	$90,925	59.7%	48.6%
$5,001 - $20,000 (N1=191/N2 =52)	47.6%	44.5%	-$60,301	-$66,684	49,0%	29.4%
$20,001 - $50,000 (N1=339/N2 =82)	46.6%	48.1%	-$19,555	$34,085	31.7%	23.1%
$50,001 - $70,000 (N1=193/N2 =63)	56.0%	38.9%	-$130,215	-$14,127	35.5%	25.8%
$70,001 - $100,000 (N1=244/N2 =94)	64.8%	30.7%	$73,677	$49,889	56.4%	46.8%
$100,001 - $150,000 (N1=208/N2 =99)	71.6%	23.1%	$177,459	$80,733	66.3%	40.8%
More than $150,000 (N1=113/N2 =46)	75.2%	21.2%	$240,746	$183,671	65.2%	60.1%
Total[26] (N1=2000/N2 =651)	57.0%	36.8%	$85,428	$61,840	53.9%	43.3%

18   Note that the insured and non-insured proportions do not sum to 100% as some respondents were uncertain as to whether they had insurance or not.

19   The proportion of those with insurance who have inadequate insurance, i.e. at least 20% below the ideal level of cover. The ideal cover is based on respondent answers. This includes those severely underinsured. The proportion inadequately but not severely underinsured can be calculated as the difference between the two figures.

20   The proportion of those with insurance who have severely inadequate insurance, i.e. at least 40% below the ideal level of cover. This is a subset of those with inadequate insurance.

21   The proportion of respondents that reported an income level of less than $5000 was 24.7%, a proportion that seems inappropriately high. This compares to 8.7% of the population aged 20-64 at the 2006 census that reported income of $5000 or less. It appears some respondents chose to give a fictitiously low income figure because they did not want to provide income details, but had agreed to do so in accepting the invitation to participate in the survey.

22   N1 is the number of respondents in the sample that reported having the specified level of income. Thus, for example, 493 people reported having income of $5000 or less. It is the basis of the proportions reported in columns (1) and (2).

23   Not everyone who said they had insurance then provided information on how much insurance they had which was necessary for the calculations of underinsurance. N2 is the number of respondents in the income group that provided information about the amount of insurance they held.   So, for example, in the $5000 or less income group only 181 people (of the 280 who said they had life insurance) actually provided information about how much insurance they had. N2 is the basis of the proportions reported in columns (4) and (5), and the calculations for the figures reported in column (3).

24   All percentages are reported to one decimal place.

25   Dollar amounts are reported to the nearest dollar.

26   The Total for both N1 and N2 includes those that had a "Don't know" response for income, which are not shown separately in Table.

Low proportions of all income groups hold the other forms of insurance, but the higher income groups hold these forms of insurance at relatively greater proportions. Note that because these covers rebate against welfare payments, low rates of ownership amongst the below $20,000 groups may be rational. Note, however, that these groups may be business owners, with low current income.

Table 2: Proportion of respondents who hold other forms of insurance by income level

	Proportion insured		
	Permanent Disability	Trauma	Income Protection
Less than $5000	16.2%	17.0%	20.3%
$5,001 - $20,000	14.1%	9.9%	16.2%
$20,001 - $50,000	10.0%	9.7%	15.6%
$50,001 - $70,000	11.4%	16.6%	18.7%
$70,001 - $100,000)	23.0%	20.9%	26.2%
$100,001 - $150,000	22.1%	17.8%	24.5%
More than $150,000	23.9%	24.8%	33.6%
Total	15.5%	15.3%	20.5%

The proportion of each ethnic group that holds life insurance is very consistent across the groups. Almost all ethnic groups are underinsured, but the extent of underinsurance varies. Underinsurance is particularly high for the Samoan and Other Asian groups. However in comparison to the wide ethnic differences in the US, New Zealand ethnic differences are low, indicating insurance companies are doing a good job here.

Table 3: Underinsurance for life insurance by ethnicity[27,28]

	Proportion insured	Proportion with no insurance	Average underinsurance		Proportion with inadequate insurance	Proportion that is severely underinsured
			Life 1	Life 2		
NZ European/Pakeha (N1=1159/N2=403)[29]	58.4%	37.1%	$75,368	$46,235	50.8%	38.7%
Maori (N1=397/N2=134)	55.9%	36.8%	$81,294	$97,428	54.5%	46.3%
Samoan (N1=92/N2=28)	57.6%	32.2%	$197,254	$78,052	75.0%	67.9%
Other Pacific peoples (N1=68/N2=20)	58.8%	33.8%	$46,326	$1,683	45.0%	40.0%
Chinese (N1=153/N2=40)	58.2%	34.6%	$142,580	$91,391	67.5%	52.5%
Indian (N1=137/N2=41)	56.9%	35.8%	-$1,404	$87,505	58.5%	41.5%
Other Asian (N1=116/N2=30)	56.9%	33.6%	$125,114	$22,771	63.3%	60.0%
Other European (N1=104/N2=33)	49.0%	44.2%	$65,923	$54,869	54.5%	36.4%

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27   The other ethnic groups included in the survey were too small for results to be reported. These groups were Tongan (N=19), Korean (N=1), Others (N=12), and Don't Know (2)

28   No Total rows are provided for Tables 3 and 4 as the information would be the same as the Total rows in Tables 1 and 2 respectively.

29   Respondents could select multiple ethnic groups, so the groups are not exclusive

The only substantial point to note about the proportion of each ethnic group that holds the other forms of insurance is the markedly lower levels for all three insurance types for the Other Pacific Peoples group.

Table 4: Proportion with other forms of insurance by ethnicity

	Proportion insured		
	Permanent Disability	Trauma	Income Protection
NZ European/Pakeha	17.3%	16.8%	21.9%
Maori	14.1%	13.9%	20.2%
Samoan	15.2%	14.1%	21.7%
Other Pacific peoples	5.9%	10.3%	8.8%
Chinese	17.0%	17.6%	26.1%
Indian	10.2%	12.4%	19.0%
Other Asian	15.5%	17.2%	15.5%
Other European	11.5%	11.5%	14.4%

Table 5 compares the rates of non-insurance for New Zealand, Australia and the USA for families with children. This shows comparable rates, despite quite different insurance structures. It needs to be noted, however, that the table is illustrative rather than accurate, as the definitions of "family" differs between the countries.

Table 5: Non-Insurance Country Comparison

Life Insurance Rates – Families with Children

		No Life	> 20% drop	> 40% drop	Has TPD	Has IP	Has Tra
USA	Bernheim 1999		66%	20%			
	Bernheim 2003		66%	33%			
	Mitchel 2003	22%					
	Limra 2010	30%	70%				
	Genworth 2011	40%					
	Limra 2011	47%					
Aust	Sweeny 2008	29%	86%	60%	71%	31%	
	Comminsure 2004	33%	60%				
	ING 2008	38%				33%	25%
	LifeBroker 2010	51%				21%	
NZ	AMP 2005	45%	40%		14%	23%	18%
	Cigna 2011	36%					
	Our Results	26%	74%	58%	19%	19%	25%

HOUSEHOLD GROUPS

We created eight typical family household groups, as a means of better understanding who is underinsured. For these groups we assume that net assets, house equity or investable, levels are as stated by respondents in the survey. A disabled benefit of $13,090 p/a is assumed available, so little is gained from income protection cover for a worker below $30,000. We assume that current annual earnings determine the level of consumption which is to be maintained by insurance cover, thus ignoring any increases in household consumption which would reasonably arise from normal

job advancements. We also ignore any increased expenses as children age. Both of these induce a downward bias in ideal cover levels.

The ideal life cover figure we use includes a sum for maintaining consumption levels after retirement on top of listed assets. It is appropriate to include this in life sums for the younger age groups, but this assumption has little impact for the younger groups due to time discounting. It does, however, impact on the wealthier couples with the older age groups, especially group (viii). The issue with this latter age group is that if those couples expect to maintain their current living standards after retirement then this should be reflected in their current levels of investable assets. Since it may be inappropriate for retirement savings to be reflected in their life sums (and maybe unavailable in practise), life sums with, and without, retirement are provided, as a comparison of possible variance in ideal cover levels, in Appendix Two.

The household groups are:

(i)   Single without dependants [Single]
(ii)   Young couples, under 35, without dependants [Young Couple]
(iii)   Single parent with youngest child under eighteen [Single Parent Family]
(iv)   Family with one earner, children of any age [Single Earner Family]
(v)   Couples with two earners, and youngest child under five [Pre-school Family]
(vi)   Couples with two earners, and youngest child between 5-12 [Primary School Family]
(vii)   Couples with two earners, and youngest child between 13- 18 [Teenage Family]
(viii) Older couple, aged 50-65, with adult children no dependants [Older Couple]

The household groups are described in more detail in Appendix One, while more detailed analysis of ideal insurance cover for these households under a range of income levels is in Appendix Two. Appendix Three has two, more detailed, examples illustrating the calculation of the ideal insurance cover.

Household composition statistics[30] as at 30th June 2011 show that one family households are 1,009,600, or 70.0% of the total 1.44M New Zealand households. These family households comprise 332,700 (23.1% of all households) couple only households, 365,100 (25.3%) couples with children, and 95,600 (6.6%) single parent with dependent children households. There were 216,200 (15.0%) households comprising singles without dependants

The appropriate level of insurance is calculated by two methods. The first method is a simple calculation of 5 times the annual after-tax income for life and permanent disability. The second method is the formal needs-based calculation described previously. In the case of income protection insurance there is only one calculation as the appropriate level of insurance is taken as 75% of the reported net income on a monthly after-tax basis. There is also only one calculation for Trauma, six months net consumption or $50,000.

HOUSEHOLD ONE – SINGLE WITHOUT DEPENDANTS

In the case of a single person, there are few needs around death, only sufficient accessible funds for a funeral and clear estate arrangements. However, there are TPD and Trauma needs, as any permanent interruption to the ability to earn a living has a high present value. The level of IP cover will depend on the gap between incomes and benefit level. Rates and levels of insurance cover for this group are given in Table 6.

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30   Source: Statistics New Zealand Table Builder – Household income by source of household income and household type.

Table 6: Insurance held by Single Person Household

	Proportion with this insurance	Level of insurance held		
		Mean	Maximum	Minimum
Life (N=54)[31]	32.1%	$176,267	$1,000,000	$100
TPD (N=9)	14.2%	$182,456	$500,000	$100
Trauma (N=5)	4.9%	$350,200	$550,000	$1,000
Income Protection (N=17)	11.2%	$2,501	$8,083	$3

Single households see a low need for insurance with less than 1/3 having life insurance, and lower proportions holding other forms of insurance. The life insurance held by this group may be mortgage related. The high level of trauma insurance compared to life insurance may reflect the fact that the insured person will personally get the benefit if a claim is necessary, but the difference must be treated with extreme caution due to the low numbers involved.

The level of non-insurance is substantially below that noted in Appendix Four for the US and Australia. The need for life cover can, however, be low in this group if there are no, or limited, needs for dependants after death. There should be higher needs for insurance products that look after the insured person, given there is no spouse to fall back on. The low levels of holdings of TPD, trauma or income protection cover is of possible concern.

Table 7: Level of Underinsurance for Insured Single Households

	Based on 5 X salary			Ideal		
	Mean	Maximum	Minimum[32]	Mean	Maximum	Minimum
Life (N=48)	$16,821	$389,395	-$1,000,000	-$55,685	$520,044	-$838,000
Permanent Disability (N=9)	$69,624	$299,395	-$353,310	-$12,006	$430,044	-$488,000
Trauma (N=5)	n.a.	n.a.	n.a.	-$300,200	$49,000	-$500,000
Income Protection (N=16)	n.a.	n.a.	n.a.	$660	$3,479	-$4,484

Table 7 shows that for the simple estimate of the required level of insurance, the average level of underinsurance for life is not substantial, although there are extremes at both ends of the scale. On average, the level of trauma insurance held is well in excess of requirements.

Once the more formal calculation is done taking account of the respondent's circumstances, the level of underinsurance decreases dramatically, and on average the respondent has more life, TPD and Trauma insurance than required. However, the higher levels may be in recognition of possible future needs in the expectation of gaining dependants at some future time.

Table 8 shows that levels of underinsurance for uninsured single households are substantial.

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31   For Tables 6-29, N=the number of respondents in the household group that provided information about the actual level of insurance cover held.

32   A negative figure indicates that the person has more insurance than is required according to the model described in this report.

Table 8: Level of Underinsurance for Uninsured Single Households

	Based on 5 X salary			Ideal		
	Mean	**Maximum**	**Minimum**	**Mean**	**Maximum**	**Minimum**
Life (N=139)	$146,028	$399,395	$63,745	$69,447	$912,120	$12,000
Permanent Disability (N=182)	$149,009	$399,395	$63,745	$72,003	$912,120	$12,000
Trauma (N=194)	n.a.	n.a.	n.a.	$50,000	$50,000	$50,000
Income Protection (N=177)	n.a.	n.a.	n.a.	$1,879	$4,992	$797

HOUSEHOLD TWO - YOUNG COUPLES, UNDER 35, WITHOUT DEPENDANTS

In the case of young couples, there may be life insurance needs if there is a substantial income gap between the couple, and there is a felt need to support the lower earner after death. There is therefore no basis for an ideal level of life ownership with this group. There should, however, be high rates of ownership of TPD, Trauma and IP, as any permanent interruption to the ability to earn a living has a high present value, or the uninjured partner cannot easily replace lost income. Note that a non-earner cannot obtain IP cover.

Table 9: Insurance held by Young Couple Households

		Proportion with this insurance	Level of insurance held		
			Mean	**Maximum**	**Minimum**
Life	Person 1 (N=29) Person 2 (N=15)	39.8% 25.5%	$260,159 $283,817	$700,000 $500,000	$50,000 $50,000
Permanent Disability	Person 1 (N=3) Person 2 (N=0)	8.3% 3.8%	$216,667 DK[33]	$350,000 DK	$100,000 DK
Trauma	Person 1 (N=6) Person 2 (N=3)	12.0% 7.5%	$153,333 $183,333	$400,000 $400,000	$20,000 $50,000
Income Protection	Person 1 (N=11) Person 2 (N=2)	18.0% 7.5%	$3,150 $3,000	$6,956 $3,000	$1 $3000

Young couples are more likely to hold insurance, and to have higher levels of insurance, than the singles. The very low percentage of this group who own TPD, trauma or income protection cover implies that even middle or higher income couples would be completely dependent on their partner, government welfare, and, if need be, residential care, in the event that an incident occurred. The burden which a permanently disabled spouse would place on the able-bodied spouse when there is inadequate financial support has major implications for the survival of the relationship.

Table 10 shows the substantial levels of underinsurance. There are some differences between the amounts of insurance held for each person, but the small numbers reported mean that no generalisations can be made about the relative levels of insurance held. There are 332,700 couple households of all ages.

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33   None of the respondents were able to provide a figure for the level of permanent disability insurance on the second person.

Table 10:   Level of Underinsurance for Insured Young Couple Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=28) Person 2 (N=15)	-$20,218 $42,254	$299,395 $287,935	-$300,605 -$327,640	$145,232 $54,708	$595,071 $388,829	-$167,525 -$379329
Permanent Disability	Person 1 (N=3) Person 2 (N=0)	$83,830 DK	$114,160 DK	$49,395 DK	$306,521 DK	$357,467 DK	$242,219 DK
Trauma	Person 1 (N=6) Person 2 (N=3)	n.a. n.a.	n.a. n.a.	n.a. n.a.	-$103,333 -$18,750	$30,000 -$50,000	-$350,000 -$350,000
Income Protection	Person 1 (N=11) Person 2 (N=2)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$350 $2,040	$3,598 $3,599	-$1,964 -$845

On average the young couples should have over $350,000 insurance on the life of the first earner and nearly $150,000 insurance on the life of the second earner, and for the uninsured this is a relatively substantial lack of insurance cover.

Table 11: Level of Underinsurance for Uninsured Young Couple Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=69) Person 2 (N=66)	$210,861 $142,190	$506,850 $506,850	$63,745 $63,745	$363,113 $148,690	$889,753 $704,761	$12,000 $12,000
Permanent Disability	Person 1 (N=101) Person 2 (N=95)	$215,927 $144,802	$506,850 $506,850	$63,745 $63,745	$369,011 $158,284	$889,753 $704,761	$12,000 $12,000
Trauma	Person 1 (N=99) Person 2 (N=93)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$50,007 $50,007	$50,685 $50,685	$50,000 $50,000
Income Protection	Person 1 (N=90) Person 2 (N=84)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$2,617 $1,750	$6,336 $6,336	$797 $797

HOUSEHOLD THREE - SINGLE PARENT WITH YOUNGEST CHILD UNDER EIGHTEEN

In the case of the single parent household there are obvious needs for clear estate and child care arrangements, as well as sufficient life cover to ensure children have sufficient funds for their guardian to maintain their living standards above orphan benefits of $8,446 p/a per child until age 18. There is need for TPD cover, especially as there is no spouse to provide support and to care for children. There are also needs for cover if the children are permanently disabled, but there are restrictions around the availability of life cover to under-18's, and no access to IP cover.

Table 12 shows that levels of cover of all the types of insurance are higher than for the singles or dependant-less couples. However, given the vulnerability of the children, the low levels of TPD, Trauma and Income Protection cover are a concern.

Table 12: Insurance held by Single Parent Households

	Proportion with this insurance	Level of insurance held		
		Mean	Maximum	Minimum
Life (N=53)	55.5%	$355,123	$4,500,000	$10,000
Permanent Disability (N=8)	12.2%	$196,250	$500,000	$10,000
Trauma (N=17)	20.1%	$154,283	$513,000	$22,300
Income Protection (N=10)	17.1%	$2,949	$5,200	$48

It is reassuring to note that levels of cover are reasonable. Table 13 shows that on average these households hold excess life cover. This suggests a recognition by those that have insurance of the importance of having an appropriate level of cover. The low response rates for TPD, trauma and income protection restrict the statistical significance of underinsurance for those types.

Table 13: Level of Underinsurance for Insured Single Parent Households

	Based on 5 X salary			Ideal		
	Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life (N=52)	-$152,658	$603,630	-$4,212,065	-$316,604	$248,955	-$4,488,000
Permanent Disability (N=8)	-$35,347	$237,935	-$212,065	-$163,300	$106,230	-$480,053
Trauma (N=17)	n.a.	n.a.	n.a.	-$102163	$27,700	-$462,315
Income Protection (N=10)	n.a.	n.a.	n.a.	$214	$2,107	$1,601

Table 14: Level of Underinsurance for Uninsured Single Parent Households

	Based on 5 X salary			Ideal		
	Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life (N=57)	$145,175	$399,395	$63,745	$20,839	$116,975	$12,000
Permanent Disability (N=113)	$151,813	$399,395	$63,745	$21,405	$206,977	$12,000
Trauma (N=103)	n.a.	n.a.	n.a.	$50,000	$50,000	$50,000
Income Protection (N=16)	n.a.	n.a.	n.a.	$1,926	$4,992	$797

HOUSEHOLD FOUR - FAMILY WITH ONE EARNER, CHILDREN OF ANY AGE

In the case of the family with only one earner there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. Levels of cover will be high as any permanent interruption to the ability to earn a living has a high present value. Note that a non-earner cannot obtain IP cover.

Table 15 shows quite a high rate of life insurance ownership on the main earner, comparable with the US and Australia, which have set cover under compulsory superannuation schemes. This may be related to the high rates of home mortgages in this group with associated life cover requirements from the lender. There are still significantly lower rates of cover for TPD, trauma and income protection.

Table 15: Insurance held by Single Earner Family Households

| | | Proportion with this insurance | Level of insurance held | | |
			Mean	Maximum	Minimum
Life	Person 1 (N=63) Person 2 (N=51)	73.3% 56.8%	$381,034 $294,853	$2,500,000 $775,000	$200 $300
Permanent Disability	Person 1 (N=15) Person 2 (N=7)	18.9% 11.5%	$273,181 $202,687	$700,000 $310,000	$100,000 $100,000
Trauma	Person 1 (N=19) Person 2 (N=13)	18.9% 13.5%	$105,430 $101,447	$300,000 $300,000	$10,000 $10,000
Income Protection	Person 1 (N=15) Person 2 (N=0)	25.0% 7.4%	$2994 DK	$7,290 DK	$28 DK

Table 16 shows there does not seem to be an issue with underinsurance for the main earner. While the high rate of life cover on the main earner may be associated with life cover held as a compulsory part of a mortgage, that level of cover does not seem to be inadequate. While it is not possible to calculate the appropriate level of insurance based on the simple approach of 5 times salary for the second adult due to the lack of income, it is possible to do so more formally, and this shows that on average the 2nd adult in the Single Earner Family Household has more life and permanent disability insurance than required.

Table 16: Level of Underinsurance for Insured Single Earner Family Households

| | | Based on 5 X salary | | | Ideal | | |
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=63) Person 2 (N=51)	-$96,764 n.c.[34]	$287,735 n.c.	-$2,327,640 n.c.	-$313,743 -$114,358	$11,800 $567,085	-$2,488,000 -$638,237
Permanent Disability	Person 1 (N=15) Person 2 (N=7)	$78,616 n.c.	$603,630 n.c.	-$185,840 n.c.	-$173,757 $26,623	$106,977 $275,460	-$507,397 -$275,066
Trauma	Person 1 (N=19)	n.c.	n.c.	n.c.	-$53,497	$75,363	-$250,000
Income Protection	Person 1 (N=15)	n.a.	n.a.	n.a.	$1,068	$10,470	-$2,901

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34   n.c. means that no calculation was possible as the 2nd adult in the family did not have an income

Table 17: Level of Underinsurance for Uninsured Single Earner Family Households

		Based on 5 X salary			Ideal		
		Mean	**Maximum**	**Minimum**	**Mean**	**Maximum**	**Minimum**
Life	Person 1 (N=35)	$192,947	$399,395	$63,745	$39,553	$328,063	$12,000
	Person 2 (N=35)	n.c.	n.c.	n.c.	$60,631	$234,295	$12,000
Permanent Disability	Person 1 (N=99)	$231,199	$853,630	$63,745	$51,089	$530,044	$12,000
	Person 2 (N=99)	n.c.	n.c.	n.c.	$71,766	$567,085	$12,000
Trauma	Person 1 (N=94)	n.a.	n.a.	n.a.	$50,364	$185,363	$50,000
Income Protection	Person 1 (N=97)	n.a.	n.a.	n.a.	$2,890	$10,670	$797

HOUSEHOLD FIVE - COUPLES WITH TWO EARNERS, YOUNGEST CHILD DEPENDENT IS UNDER FIVE

In the case of families with pre-school children there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. Note that levels of cover will be high, but not as high as Household Four, and will vary depending on the level of asymmetry between the couple in earning ability.

Table 18 shows lower rates of life cover than Household Four, though the differences are unlikely to be statistically significant. There are, however, higher rates of trauma and income protection ownership on the main earner, despite the reduced vulnerability of income due to two earners. Possibly this is due to dependence on both incomes to meet financial obligations. These rates of insurance ownership are comparable to the US and Australian rates outlined in Appendix Four.

Table 18: Insurance held by Preschool Family Households

		Proportion with this insurance	Level of insurance held		
			Mean	**Maximum**	**Minimum**
Life	Person 1 (N=84)	66.7%	$330,592	$1,400,000	$2
	Person 2 (N=67)	55.4%	$312,009	$1,300,000	$10,000
Permanent Disability	Person 1 (N=17)	19.2%	$179,329	$500,000	$30,000
	Person 2 (N=13)	14.2%	$165,277	$500,000	$25,000
Trauma	Person 1 (N=23)	23.0%	$120,238	$385,875	$4,600
	Person 2 (N=17)	19.1%	$137,404	$385,875	$10,000
Income Protection	Person 1 (N=24)	40.0%	$3,520	$9,000	$15
	Person 2 (N=11)	13.7%	$2,192	$5,000	$15

Table 19 does show that levels of life underinsurance are substantial for this group on the both earners, particularly the main earner, compared to the ideal levels, but on average both earners are overinsured compared to the multiplier level. The survey data suggests a tendency for households to cover both earners to similar levels, despite differing financial vulnerability.

Table 19: Level of Underinsurance for Insured Preschool Family Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=84)	-$78,853	$289,145	-$1,112,065	$261,146	$1,261,124	-$917,086
	Person 2 (N=67)	-$86,964	$287,935	-$1,170,915	$82,790	$820,412	-$1,239,297
Permanent Disability	Person 1 (N=17)	$41,774	$214,160	-$406835	$426,181	$1,061,550	-$260,305
	Person 2 (N=13)	-$70,238	$45,400	-$335,875	$172,686	$507,080	-$338,666
Trauma	Person 1 (N=23)	n.a.	n.a.	n.a.	-$70,238	$45,400	-$335,875
	Person 2 (N=17)	n.a.	n.a.	n.a.	-$43,435	$50,000	-$335,875
Income Protection	Person 1 (N=24)	n.a.	n.a.	n.a.	-$230	$4,232	-$4,008
	Person 2 (N=11)	n.a.	n.a.	n.a.	$1,113	$3,599	-$1,604

Table 20: Level of Underinsurance for Uninsured Preschool Family Households

		Based on 5 X salary/monthly salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=55)	$221,696	$853,630	$63,745	$520,609	$2,775,714	$12,000
	Person 2 (N=54)	$127,194	$287,935	$63,745	$274,804	$798,222	$12,000
Permanent Disability	Person 1 (N=124)	$228,441	$853,630	$63,745	$553,100	$2,775,714	$12,000
	Person 2 (N=126)	$128,786	$287,935	$63,745	$284,420	$820,412	$12,000
Trauma	Person 1 (N=119)	n.a.	n.a.	n.a.	$50,567	$85,363	$50,000
	Person 2 (N=121)	n.a.	n.a.	n.a.	$50,000	$50,000	$50,000
Income Protection	Person 1 (N=119)	n.a.	n.a.	n.a.	$2,778	$10,670	$797
	Person 2 (N=120)	n.a.	n.a.	n.a.	$1,594	$3,599	$797

HOUSEHOLD SIX - COUPLES WITH TWO EARNERS, YOUNGEST CHILD AGED 5-12

In the case of families with primary school children, there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. Note that levels of cover required will be high, but not as high as Household Five due to a shorter period to retirement as the average age of the parents increases along with that of the children, and will vary depending on the level of asymmetry between the couple in earning ability.

Table 21 shows that similar but slightly higher rates of insurance ownership relative to Household Five, though lower rates of income protection. This could be due to the greater financial flexibility of these families with two possibly full-time workers.

Table 21: Insurance held by Primary School Family Households

		Proportion with this insurance	Level of insurance held		
			Mean	Maximum	Minimum
Life	Person 1 (N=88) Person 2 (N=70)	71.4% 58.7%	$320,909 $288,439	$1,500,000 $1,500,000	$100 $100
Permanent Disability	Person 1 (N=48) Person 2 (N=15)	23.3% 16.0%	$193,111 $186,581	$1,000,000 $1,000,000	$3,000 $1,500
Trauma	Person 1 (N=23) Person 2 (N=17)	24.8% 18.9%	$108,776 $81,934	$500,000 $300,000	$30,000 $10,000
Income Protection	Person 1 (N=28) Person 2 (N=23)	25.7% 12.6%	$2,965 $2,625	$8,500 $5,000	$1 $500

Table 22 shows similar results to Household Five, with substantial underinsurance on the life of the primary earner and over-insurance on the life of the secondary earner. The existence of two incomes means a lower need for insurance than for the previous household type, but the need is still substantial and the lack of insurance is a concern.

Table 22: Level of Underinsurance for Insured Primary School Family Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=87) Person 2 (N=69)	-$61,255 -$70,650	$653,630 $214,160	-$1,100,605 -$1,285,840	$252,825 -$96,906	$1,949,303 $907,511	-$912,829 -$1,409242
Permanent Disability	Person 1 (N=25) Person 2 (N=15)	$59,670 $40,893	$396,395 $397,895	-$712,065 -$785,840	$320,017 $177,728	$923,401 $763,349	-$591,329 -$796,723
Trauma	Person 1 (N=27) Person 2 (N=23)	n.a. n.a.	n.a. n.a.	n.a. n.a.	-$57,512 -$3,842	$20,000 $50,000	-$414,637 -$250000
Income Protection	Person 1 (N=35) Person 2 (N=8)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$246 $985	$4,991 $3,492	-$3,508 -$2,104

Table 23: Level of Underinsurance for Uninsured Primary School Family Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=42) Person 2 (N=42)	$179,458 $124,008	$287,935 $399,395	$63,745 $63,745	$393,835 $282,799	$876,774 $1,042,145	$33,820 $16,765
Permanent Disability	Person 1 (N=122) Person 2 (N=124)	$216,007 $129,306	$853,630 $399,395	$63,745 $63,745	$489,849 $297,602	$2,335,930 $1,216,174	$12,000 $12,000
Trauma	Person 1 (N=121) Person 2 (N=122)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$50,295 $50,000	$85,363 $50,000	$50,000 $50,000
Income Protection	Person 1 (N=124) Person 2 (N=124)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$2,671 $1,629	$10,670 $4,992	$797 $797

HOUSEHOLD SEVEN - COUPLES WITH TWO EARNERS, YOUNGEST CHILD AGED 13- 18

In the case of families with teenage children, there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. Note that levels of cover will be high, but not as high as Household Five or Six, and will vary depending on the level of asymmetry between the couple in earning ability.

Rates of insurance ownership and insurance levels, shown in Table 24, are similar to the earlier family household groups. Low response rates restrict the statistical significance of results.

Table 24: Insurance held by Teenage Family Households

		Proportion with this insurance	Level of insurance held		
			Mean	Maximum	Minimum
Life	Person 1 (N=54) Person 2 (N=44)	71.1% 57.9%	$265,176 $211,698	$1,500,000 $550,000	$250 $250
Permanent Disability	Person 1 (N=11) Person 2 (N=9)	22.8% 15.8%	$101,273 $96,778	$250,000 $250,000	$30,000 $25,000
Trauma	Person 1 (N=13) Person 2 (N=14)	21.1% 19.3%	$110,822 $124,500	$500,000 $500,000	$12,000 $12,000
Income Protection	Person 1 (N=14) Person 2 (N=4)	25.4% 13.2%	$3,068 $3,333	$7,083 $6,000	$1,100 $1,000

Table 25 shows similar results to Household Five, with substantial underinsurance on the life of both earners.

Table 25: Level of Underinsurance for Insured Teenage Family Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=53) Person 2 (N=44)	-$24,808 -$12,268	$379,395 $287,935	-$1,285,840 -$377,640	$219,066 $162,321	$895,457 $933,924	-$1,314,962 -$338,000
Permanent Disability	Person 1 (N=11) Person 2 (N=9)	$172,875 $105,988	$282,935 $287,935	$37,935 -$46,255	$502,947 $332,074	$860,920 $933,924	$300,470 -$98,000
Trauma	Person 1 (N=13) Person 2 (N=14)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$60,822 $58,938	$450,000 $450,000	$38,000 $50,000
Income Protection	Person 1 (N=14) Person 2 (N=4)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$264 $897	$1,599 $2,677	-$2,091 -$2,401

Table 26: Level of Underinsurance for Uninsured Teenage Family Households

		Based on 5 X salary/			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=29)	$216,696	$399,395	$63,745	$405,977	$1,000,214	$18,473
	Person 2 (N=28)	$130,107	$287,935	$63,745	$267,693	$655,439	$12,000
Permanent Disability	Person 1 (N=74)	$224,696	$399,395	$63,745	$451,111	$1,052,092	$18,473
	Person 2 (N=73)	$131,473	$287,935	$63,745	$290,803	$700,779	$12,000
Trauma	Person 1 (N=78)	n.a.	n.a.	n.a.	$50,000	$50,000	$50,000
	Person 2 (N=77)	n.a.	n.a.	n.a.	$50,000	$50,000	$50,000
Income Protection	Person 1 (N=80)	n.a.	n.a.	n.a.	$2,854	$4,992	$797
	Person 2 (N=80)	n.a.	n.a.	n.a.	$1,756	$3,599	$797

HOUSEHOLD EIGHT - OLDER COUPLE, AGED 50-65, WITH NO DEPENDANTS

In the case of older couples, there are substantially lower needs around death, providing only sufficient accessible funds for coverage of any income gap to retirement of the survivor, a funeral and clear estate arrangements. This will vary depending on the level of asymmetry between the couple in earning ability, and the funds available to support retirement. There will be lesser TPD, Trauma and IP needs, as any permanent interruption to the ability to earn a living will have a lower present value.

Note that the majority of the life insurance sum is to secure retirement income, and as retirement is closer the future value of the net assets saved is lower, so the life sum increases. The sum required to sustain the present standard of living in retirement should have been substantially secured at this stage with higher investments than we assume, (and the life sums listed may not be offered in practice) so life sums without retirement investments are also listed. There will be an increasing issue with escalating premium costs.

Table 27 shows decreased rates of ownership of all types of insurance, especially on the secondary earner.

Table 27: Insurance held by Older Couple Households

		Proportion with this insurance	Level of insurance held		
			Mean	Maximum	Minimum
Life	Person 1 (N=51)	61.4%	$173,477	$3,000,000	$3,000
	Person 2 (N=38)	39.3%	$114,368	$500,000	$2,000
Permanent Disability	Person 1 (N=8)	18.6%	$389,785	$2,000,000	$8,000
	Person 2 (N=3)	10.0%	$150,000	$300,000	$50,000
Trauma	Person 1 (N=5)	10.0%	$251,360	$1,000,000	$50,000
	Person 2 (N=1)	6.4%	$50,000	$50,000	$50,000
Income Protection	Person 1 (N=8)	16.4%	$4,491	$6,500	$1,000
	Person 2 (N=2)	5.7%	$2,458	$2,500	$2,416

Table 28 shows a moderate degree of underinsurance on the life of both the primary earner and the life of the secondary earner. However, the ideal figure uses inadequate data on levels of assets so the levels of insurance held could be appropriate for current expectations.

Table 28: Level of Underinsurance for Insured Older Couple Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=47) Person 2 (N=35)	$21,156 $45,229	$366,395 $287,935	-$2,936,255 -$212,065	$105,494 $124,229	$668,233 $521,245	-$2,988,000 -$129,984
Permanent Disability	Person 1 (N=8) Person 2 (N=3)	-$126,376 $106,504	$366,395 $399,395	-$1,600,605 -$188,345	-$21,391 $263,955	$520,867 $948,382	-$1,227,249 -$76,151
Trauma	Person 1 (N=5) Person 2 (N=1)	n.a. n.a.	n.a. n.a.	n.a. n.a.	-$201,360 $40,000	$0 $50,000	-$950,000 $0
Income Protection	Person 1 (N=8) Person 2 (N=2)	n.a. n.a.	n.a. n.a.	n.a. n.a.	-$1,179 $1,687	$1,677 $4,992	-$2,901 -$1,619

Table 29: Level of Underinsurance for Uninsured Older Couple Households

		Based on 5 X salary			Ideal		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
Life	Person 1 (N=47) Person 2 (N=38)	$182,575 $108,984	$506,850 $506,850	$63,745 $63,745	$263,689 $213,073	$1,221,746 $1,250,358	$12,000 $12,000
Permanent Disability	Person 1 (N=97) Person 2 (N=84)	$177,114 $105,631	$506,850 $506,850	$63,745 $63,745	$245,676 $184,266	$1,221,746 $1,250,358	$12,000 $12,000
Trauma	Person 1 (N=102) Person 2 (N=88)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$50,013 $50,008	$50,685 $50,685	$50,000 $50,000
Income Protection	Person 1 (N=101) Person 2 (N=87)	n.a. n.a.	n.a. n.a.	n.a. n.a.	$2,172 $1,263	$6,336 $6,336	$797 $797

EXTENT OF UNDERINSURANCE FOR LIFE INSURANCE[35]

It is important to note that while rates of ownership of life insurance are low for some groups, within the key family groups there is little evidence that ownership rates are too low. There is, however, strong evidence the levels of life cover held are inadequate.

Table 30 provides an overview of the level of insurance held by household type. It clearly shows the higher level of insurance held by families with dependent children, although the difference is more marked for life insurance than for the other forms of insurance.

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35   As discussed in the main text, there are several limitations in these estimates, which are increased for the other forms of insurance due to the small numbers involved. Discussion of underinsurance is therefore limited to life insurance.

Table 30: Insurance levels by household typE[36]

	Life	TPD	Trauma	Income Protection
Single	32.1%	14.2%	4.9%	11.2%
Young couple	39.8%	8.3%	12.0%	18.0%
Single-parent family	55.5%	12.2%	20.1%	17.1%
Single-earner family	73.3%	18.9%	18.9%	25.0%
Pre-school family	66.7%	19.2%	23.0%	40.0%
Primary school family	71.4%	23.3%	24.8%	25.7%
Teenage family	71.1%	22.8%	21.1%	25.4%
Older couple	61.4%	18.6%	10.0%	16.4%
Total	57.0%	15.5%	15.3%	20.5%

We can then examine the extent of underinsurance in more detail. Table 31 summarises the percentages within each group who have "inadequate" life insurance cover (more than 20% below ideal) and "severe underinsurance" life cover (more than 40% below the ideal). This is particularly high for the family groups especially on the main earner.

This indicates that while New Zealanders do, in general, own life insurance, they do not own adequate amounts, do not distinguish between the cover on asymmetrical earners and do not adequately estimate their underinsurance gap.

Table 31: Extent of inadequate and severely inadequate life insurance by household group

	Inadequate insurance		Severely underinsured	
	Life 1	Life 2	Life 1	Life 2
Single	22.9%	n.a.	20.8%	n.a.
Young couple	60.7%	20.0%	50.0%	6.7%
Single parent family	5.9%	n.a.	5.9%	n.a.
Single earner family	1.6%	7.8%	1.6%	5.9%
Pre-school family	69.0%	44.8%	54.8%	31.3%
Primary school family	73.6%	48.6%	57.5%	37.1%
Teenage family	79.6%	52.3%	68.5%	45.5%
Older couple	78.3%	72.2%	52.2%	61.1%
Total	53.9%	42.5%	43.3%	33.6%

Using the data from the survey we can estimate the extent of underinsurance for New Zealand, albeit with conditions. The conditions that must be noted with respect to this estimate are:

- Some portions of the New Zealand population are excluded, such as households comprising more than one family and households with dependent adults. These were surveyed but were not modelled here.

- Those who did not know whether they have insurance are excluded.

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36   The proportions shown for the two-earner households represent the proportion where insurance is held against the death or illness etc of the main income earner.

- This assumes that the formal estimate of the ideal level of insurance used in this study is accurate, but there are a number of reasons why this may not be the case as discussed earlier in the report.

- The calculations rely on the information supplied by the respondents, although there is some evidence that this is not completely accurate, as discussed elsewhere in the report.

- It is assumed that having no insurance means a person is underinsured, although non-insurance may be appropriate in some cases.

- Many respondents did not supply information on the level of insurance held and are therefore excluded from the estimates.

- The level of underinsurance is only in respect of life insurance on the life of the main income earner in two-income earner households.

Table 32: Estimate of national underinsurance for New Zealand

	Number of households in New Zealand	Proportion of uninsured households[37]	Proportion of severely underinsured households	Average underinsurance for the uninsured	Averaged underinsurance for the insured	Total underinsurance ($million)
Singles	216,200	66.3%	20.8%	$69,447	($55,685)	9,954
Couples[38]	332,700	47.2%	47.3%	$365,855	$118,982	62,649
Single parent	95,600	40.5%	5.9%	$20,839	($316,604)	806
Families[39]	365,100	26.4%	46.7%	$362,312	$124,985	68,507

The level of underinsurance for each household type at the national level is calculated as

$$P*N*U1 + (1-P)*N*U2$$

where:

P = the proportion of uninsured

N = the number of households in New Zealand

U1 = Average underinsurance for the uninsured

U2 = Average underinsurance for the insured[40]

The total level of life underinsurance is the sum of the final column, $141.918 billion.

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37 The respondents who answered "Don't know" as to whether they hold insurance are excluded from these calculations, so the proportions will differ from earlier tables.

38 Underinsurance data is based on all couples in the sample, which includes but is not limited to the Young Couple and Older Couple household groups used in this study.

39 Underinsurance data is based on the four family household groups in this study: Single earner family, Pre-school family, Primary school family and Teenage family.

40 Where the level of underinsurance is negative indicating more insurance is held than necessary, the level of underinsurance is assumed to be zero.

COST TO GOVERNMENT

We can now explore the issue of the cost to government of underinsurance. It is important to be clear that any estimate of the cost to government carries substantial cautions regarding its validity due to the assumptions made. In particular, it has not been possible to source adequate information on the incidence rate for events that would trigger a claim in respect of a life, TPD, Trauma or IP insurance policy.

At one level, there is no benefit to government of insurance because the formal calculation of the ideal level of insurance incorporates an allowance for the availability of government support. The calculation assumes that any government support available is utilised. There would be a cost to society as a result of the incident, and possibly a cost to the family if a lower standard of living results. However, this is beyond the scope of this report.

There may, however, be a cost to government through the tax system. This is best illustrated by example, and we use the two detailed examples from Appendix Three for this purpose.

Both examples in Appendix Three involve families who would be paying tax and receiving Working For Families' (WFF) tax credits – case 1 is the average pre-school family, while case 2 is the average teenage family. If the main earner dies there will be reduced tax revenue to government and increased WFF tax credits. Taxes paid by the deceased would be $8,016 and $9,036 for case 1 and case 2 respectively. WFF tax credits would increase by $8,638 for case 1 and $8,944 for case 2. The presence or not of life insurance, however, doesn't alter the incidence of death so there is no gain to Government from the presence of life insurance, i.e. these changes in tax revenue and WFF tax credits are the same whether the deceased person has life insurance or not.

However, there may be changes to tax revenue due to the government due to the receipt of lump sum payments from life insurance policies. Any change in tax revenue due to the receipt of life insurance lump-sums will depend on the use of those lump-sums. If they are used to pay-off debt (e.g. mortgage) then there is no change in tax liability or WFF tax credits. Given that life insurance is often taken up primarily as a condition of a mortgage, and at a rate similar in size to the initial mortgage, then the investable sum will only equal the reduction in value of the mortgage. In cases where lump-sums are available for investment, then any investment income will be taxed at the top tax rate for the household, in our two cases at 17.5%. If half of the life cover was invested ($228,587 in case 1, $149,519 in case 2) at 7%, then extra tax revenue would be $2,800 and $1,831 p/a. Working for Families' tax credits will reduce by $2,028 and $1,144 p/a. Total savings to government would be $4,828 and $2,975. For case 1 this savings related to WFF would last for 13 years, and in case 2 for 3 years, until the children are adults, or $62,764 and $8,925 in total respectively.

The recommendations for ideal life sums made in this report, however are set at a level which secures future income and implies a high level of investment assets, so the deceased spouse's income, less social welfare payments and reduced consumption, is replaced once debts are repaid. Since this implies substantial investible assets post tragedy total savings to government may be substantially higher. Note that because the investment income is added to the survivor's income, post-tragedy marginal tax rates can be higher, implying that at the same consumption level post-tragedy tax revenue may be higher than pre-tragedy.

In examples where the survivor chooses not to work, then receipt of the widow's benefit implies a post-tragedy cost to government of $18,035 p/a. The holding of life insurance, does not stop this benefit being paid, however the receipt of any investment income will lead to the benefit being rebated at 30% for income between $5,201 - $10,400 p/a and at 70% for income above that. Complete abatement occurs at $29,000p/a. The impact of increased life insurance on government finances will depend on how life insurance proceeds are split between reduced debt and invested income. Since an average NZ mortgage costs between $13,000 and $21,000 p/a, it is reasonable to assume that our ideal life cover would provide investment income at a level which is 50% rebated. Levels of debt for survey respondents is in accord with this. This implies a benefit saving to government per fully insured of $9,017 p/a for family groups. Related studies for the alternative non-family groups show an average recommended investment income of $6,638 p/a. If this figure is used at 50%, then the implied saving is $3,319 p/a per impacted household.

To accurately estimate the total cost to government we would need estimates of incidence of death , i.e. rates per year. Death incidence is well established for the general population at different ages on gender and Maori/non-Maori divisions. Death claims data are also available. In New Zealand there were 27,819 deaths of adults (20 years or older) in 2010[41], while in 2008 there were 20,317 diagnoses of cancer and 8,566 deaths from cancer (an increase of 13% since 1998)[42].

Most of these deaths, however, are of persons aged over 65, so are not relevant for life insurance. Table 33 shows extracted death rates for those aged 30 to 60 from the New Zealand Life Tables. These illustrate the difference between male and female death rates, and the generally low mortality rates until age 60. The survivorship table shows that, for males, a 30 year old has an 8.15% chance of dying before age 60, or a 12.92% chance of dying before age 65. For 30 year old females the probabilities are 5.45% and 8.67%. Note, however, that Table A-7 shows that death rates for insured lives have been below those expected from life tables and that there is a clear trend in terms of size with a higher rate of mortality for term life policies under $250,000 compared to those larger than that amount.

Table 33: Mortality Incidence

Age	Males		Females	
	Number	Incidence	Number	Incidence
30-34	113	0.092%	82	0.042%
35-39	159	0.112%	116	0.067%
40-44	257	0.156%	185	0.097%
55-59	729	0.501%	474	0.342%

It is difficult to generate an estimate for national savings for the government from the presence of full life cover If we assume no life cover and an mortality incidence rate of 0.15% from Table 33, or 2,115, deaths then the savings to government of full life insurance cover would be $7M. Our results from the prior section, however, show that, on average, households hold an adequate rate of life cover and the average level of that cover is adequate. The issue is that those averages disguise a wide variation in cover, with approximately 30% of family households owning no life cover and over 50% of the households surveyed classified as underinsured. If we make a more realistic assumption, which is supported by the shape of the underinsurance distribution, that there is 50% underinsurance then a ballpark figure of the savings to government would be $3.5M.

We can also estimate that total cost to government using the household groups on which we have national figures. Estimates of the cost to government for the average household in each group is based on the date from this study and the mortality incidence rates in Table A-8 and Table A–9. As with the calculation of the figure for underinsurance, it is important to be aware of the limitations associated with this calculation, which include:

• Some portions of the New Zealand population are excluded

• It is assumed that the mortality incidence rate is the same for the insured and uninsured households, but there is no evidence this is correct

• The mortality incidence rate does not increase in a monotonic fashion, so is not really suitable in calculations of an average

Table 34 provides the information on which this calculation is based. As discussed, the cost to government from underinsurance in terms of life insurance is from lost tax revenue and the potential reduction in WFF tax credits. The

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41 Source: Statistics New Zealand

42 Source: Ministry of Health (http://www.moh.govt.nz/moh.nsf/indexmh/cancer-new-registrations-deaths-2008)

calculation of the ideal level of insurance for the average Single household and the average Single parent household show no need for life insurance, so they excluded from this calculation. As the Couple households have no child dependents, there are no WFF tax credits involved. The level of income means there would be no reduction in WFF tax credits for the average Families household.

Table 34: Estimate of cost to government of UNDERINSURANCE

	Couple	Family
Number of households in New Zealand	332,700	365,100
Age – Person 1	45.7	40.5
Age – Person 2	43.0	38.5
Gender[43]	Male (51.0%)	Male (66.9%)
Mortality incidence[44]	0.196	0.136
Estimated number of deaths per annum	652	496
Average underinsurance – uninsured	$365,855	$362,312
Average debt	$102,510	$269,696
Investable amount – uninsureds	$263,345	$92,616
Proportion of uninsured households	47.2%	26.4%
Average underinsurance – insured[45]	$118,982	$124,985
Weighted average investable amount	$187,121	$116,439
Estimated tax loss per death[46]	$2.292	$1,426
Accumulated tax loss[47]	$1.494.384	$707,296

The total cost to government is therefore estimated at $2.2 million per annum in lost tax revenues.

COST OF DISABILITY

There will be a cost to government for short-term disability due to an accident. For the purposes of this study the costs related to hospital care and rehabilitation can be ignored as the holding of insurance related to life or income will not alter that cost.

In the case of total and permanent disability the cost to government will be relate to reduced tax revenue and increased WFF tax credits. If disability is due to an accident then there will be no additional cost to government, though there will be the ACC. If disability is due to sickness, there will be increased expenditure due to the invalid's benefit of $10,908 p/a. This is rebated at 30% for income between $4,161 and $9,360 and at 70% above that, implying a benefit saving to government per fully insured household of $5,454.

To calculate the impact of disability at a national level we needed incidence data, that is, rates of disability for selected groups or ages and the degree and duration of this disability, so that we could analyse the impact on income, and thus on government finances. However, these data were not available. Total disability rates are available on a claims

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43   Gender is for the main income earner, where there is one. The percentage is the proportion of households with the predominate gender.

44   Based on mortality incidence from Table A-8 and Table A-9. The incidence is weighted based on the proportional gender of the main income earner.

45   The underinsurance amount for insured households would be fully available for investment, as the level of insurance held on average exceeds the amount of average household debt.

46   Based on the investable amount being invested at 7% and being taxed at 17.5%.

47   Accumulated tax loss = estimated tax loss per death X estimated number of deaths per annum

basis for insured, but this does not record the reason for disability. Disability data for the general population are not available on an incidence basis, only totals. The data which are available are as follows: a 2006/2007 health survey found that 89,400 people had suffered a heart attack requiring hospitalisation at some stage, and 57,700 adults had experienced a stroke[48]. The 2006/07 NZ Health Survey[49] found 0.5% of males and 0.2% of females aged 25-34, had been diagnosed with heart disease which rose to 1.3% of males and 1.0% of females aged 35-44, 4.4% of males and 1.8% of females aged 45-54, and 10.3% of males and 6.0% of females aged 55-64. The rates for strokes were 0.3% of males and 0.2% of females aged 25-34, which rose to 0.2% of males and 0.7% of females aged 35-44, 0.8% of males and 1.1% of females aged 45-54, and 3.3% of males and 1.9% of females aged 55-64. The 2006 Disability survey[50] shows that 141,500 persons aged between 15 and 44 had disabilities and 285,500 persons aged between 45 and 64. This is 9% and 20% of these age groups. Ministry of Social Development statistics, in Table A-9, show that 58,651 New Zealanders were on sickness benefits in 2011. However, the department have been, so far, unable to provide duration figures, or income groups.

We can however create ballpark estimates of disability incidence and duration. GenRe (2009)[51] found that for New Zealanders with income protection insurance the annual claims rate was 0.71%, with an average duration of claim for accidents of 306 days, and for sickness of 492 days. Alternative data from Australasian insurance companies[52] relating to the duration of disability of those who have claimed on income protection policies show a mean disability duration of 579 days, median of 249 days, 1st quartile 121 days, 3rd quartile 646 days and a strong left skewness of -0.155. The preferred statistic is thus the median disability duration of approximately 8 months. Note that these figures are useful as they exclude the non-working age population and only include those disabled enough to not be working, so can be reliably used for benefit savings purposes. There are no reliable data on the proportion of total and permanent disability incidence within this, though the figures show

the most affected quartile is disabled for at least two years.

The population of working age within household structures comprises 2 million people, and a 0.71% incidence gives 14,200 disabled p/a. If we use our earlier estimated annual benefit savings per disabled person of $5,454 p/a and 8 months duration, the implied savings to government of full income protection insurance would be $51.6M. It needs to be noted, however, that our ideal income protection model recommends cover only for those significantly above levels of social welfare payments, and the benefit savings examples only apply to those within family groups. If we take this at a reasonable level of 50% of the population then savings to central government would be $25.8M. If we take the earlier estimated annual benefit savings for non-family groups of $3,319, then the implied value of full income protection insurance would be $31.4M. Using the sizes of the family and non-family household groups from Tables 22 and A-16 would give a ballpark estimate of implied savings to government of full income protection insurance of $25M to $35M.

It is vital to note that this figure, and the earlier one relating to life insurance, are subject to the assumptions surrounding incident incidence and tax/WWF rebates, and these assumptions can be debated. The assumptions are deliberately conservative, however, so that error is likely to be on the upside. For example, if insured households apply the insurance sums recommended for life cover to long term disability insurance then higher investment sums would be available to the insured post-event. Complete abatement of the invalid's benefit of $10,908 would imply an annual cost savings to government for 50% of the population of $51.6M. In the authors' opinion the figures are the best ballpark figures to use until more accurate disability duration statistics are available.

These figures can be used when looking at studies of policy measures for increasing the uptake of personal risk insurance. For example, they could be applied on a per capita basis on a cost-benefit when analysing possible remedial government policy measures.

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48 Source: Ministry of Health (http://www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health?Open)

49 Ministry of Health (2008)

50 Statistics New Zealand (2007)

51 GenRe (2009) New Zealand Disability Claims Survey.

52 Data on duration of insured was obtained from actuaries via the ISI.

CONCLUSIONS

The survey results show rates of life insurance ownership which are similar to those in the US or Australia, as described in earlier sections. Levels of life cover are also comparable. Similar results are obtained for TPD, trauma and income protection insurance.

There is no indication that there is a national crisis relating to non-take up of life cover. Levels of non-insurance are high within groups which have lower needs for life cover, for example, singles, and are at internationally comparable levels for groups with higher needs, for example, families. There is, however, strong evidence that levels of life cover are often poorly chosen, with little relationship between ideal cover and actual cover. For example, couples tend to insure both spouses for the same or similar amounts, despite sharply differing actual insurance needs. Statistical analysis of the entire sample gives a correlation coefficient of 0.236 between actual cover and ideal cover on the main earner and 0.17 on the secondary earner, which is almost no relationship. This is illustrated in Table A -15 in Appendix Five, which is a random extracts from the survey, and shows the lack of relationship between ideal and actual cover.

There is strong evidence of inertia in coverage levels with levels of cover not corresponding to actual financial vulnerability. This is illustrated by the lack of variation in mean levels of cover found between the household groups. International evidence shows that review of ownership of insurance and level tends to be around trigger events, such as the birth of children. The survey evidence shows that for New Zealand any review of coverage level which does occur is inadequate.

There are also indications that calculations of required life cover are inadequate, as illustrated by the typical underinsurance of the primary earner and over-insurance of the secondary earner. Table A -15 also indicates that decisions about life insurance levels do not seem to be related to actual current need, but are based on vague guesses made or historical vulnerability, or on mortgage level. The reasons for decision making around life cover levels need research. It could be noted that modern family structures are becoming more flexible, with fewer nuclear families, so the traditional insurance market is disappearing. Insurance company products and marketing seem to not be capturing this new family complexity. The table also illustrates that the traditional

insurance measures, like 5x income cover or other multiples, do not correlate to actual needs, as illustrated by Table A -15.

It needs to be noted, however, that the report's calculation of "ideal" cover uses many assumptions about family structure and finances, which may only be approximately true. The underinsurance figures should thus be regarded as ballpark figures only. It is also not usual practice for insured people to fine tune their cover levels on a frequent basis, such as marriage, death, birth of child, child leaving home, major birthday, etc.

Caution is thus needed with the conclusions - a degree of underinsurance is fine. However, our results do show a high degree of underinsurance for the majority of family groups on the life of the main earner. Table 31 shows that, in general, over half of all households would suffer a drop in present net consumption of more than 40 percent if the main earner died. Levels of cover chosen seem to show little correlation to actual insurance needs, indicating the considerations of New Zealanders about adequate insurance cover levels, or the advice they have received, is inadequate.

Reassessment of one's insurance cover is required from time to time, especially at trigger events (such as changing jobs, getting married, having children, etc); yet most Kiwis without a good adviser do not seem to do this. Understanding insurance needs across many types is complex conceptually so good advice is useful. This lack of general awareness of how to assess adequate insurance cover and the need for periodic reassessment could relate to cover levels being tied to mortgage levels only, or lack of information, or poor advice received. This

issue needs to be addressed by industry and type of insurance cover.

The survey shows that the biggest issue within New Zealand seems to be the low levels of ownership of personal insurance around permanent disability, like TPD or long-term income protection cover. Most families have high levels of financial vulnerability to medium or long term disability. Analysis of results by AC Nielsen shows similar reasons for non- or low levels of disability insurance cover as for life. The main reasons cited by respondents who do not have cover relate to it not being important or too expensive. Similar results were found for levels of inadequate cover.

As noted in earlier discussion, this stated reason may disguise other issues. Similar issues should also affect levels of general insurance, but there are no indications of low rates of house or car insurance take-up. The issue is more one of perceived lack of value for money, that is, high premiums for expected benefit. To understand this, analysis is needed around people's attitudes to personal insurance. Other survey results show that respondents did not regard personal insurance as a

priority, or had not given it much thought. This implies that New Zealanders generally do not, or do not like to, contemplate adverse events and their financial impact. It can be hard to recognise vulnerability to rare events. The industry as a whole is responding to this by trying to simplify the process and approach customers in low cost avenues like websites. These websites, however, generally have extremely low quality cover calculation tools and advice, and do not offer the personal contact which is often an essential ingredient of an insurance purchase. There is a strong need for promotion of non-life personal risk insurance products, yet these sites focus on life cover.

There is a particular issue around insurance ownership by females, as there has been very limited cultural support for females feeling a need to ensure the financial survival of their families after adverse events, even if they are the main earner. This has resulted in females being less aware of a need to buy on their own behalf, and higher paid females less likely to protect lower paid spouses. The insurance industry has not traditionally been structured to reach this market. Similar comments could be made around marketing to ethnic minorities.

However, given high rates of life insurance ownership within families, the main issue is lack of periodic review of cover levels. International evidence shows review of ownership of insurance and level tends to be around trigger events like the birth of children. Childless singles or couples do not seem to contemplate their vulnerability to medium term or permanent disability, possibly because of a lack of trigger events. There seems to be a general lack of trigger events around disability insurance decision making. The AC Nielsen analysis shows a surprisingly high tendency to regard ACC as adequate for disability cover and a lack of awareness that illness, which is statistically more likely, is not covered. There is a major need to educate New Zealanders on the hazards of disability, which is statistically more likely than death. A good starting point for this would be the automatic inclusion of TPD cover into life cover especially mortgage related products.

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APPENDIX ONE: HOUSEHOLD GROUPS

Table A - 1: Outline of Household Groups

Label	Description	Characteristics
Single	Single, w/out children 268	Size of family unit = 1 (Q9 = 1) Age of respondent <65
Young Couple	Young couples, w/out children (<35) 133	Size of family unit = 2 (Q9 = 2) No dependants (Q18=0) Age of respondent <35
Single Earner Family	Family with one earner, children of any age 148	Size of family unit is 3 or more (Q9 ≥ 3) Only one earner (Q10 = 1) Only one adult dependant At least one child dependant
Pre-school Family	Family with more than one earner, children of pre-school age (0-4) 631	Size of family unit is 3 or more (Q9 ≥ 3) At least two earners (Q10 ≥ 2) At least one child dependant No adult dependants Youngest child dependant aged 0-4
Primary School Family	Family with more than one earner, children of primary school age (5-12)	Size of family unit is 3 or more (Q9 ≥ 3) At least two earners (Q10 ≥ 2) At least one child dependant No adult dependants Youngest child dependant aged 5-12
Teenage Family	Family with more than one earner, teenaged children (13-19)	Size of family unit is 3 or more (Q9 ≥ 3) At least two earners (Q10 ≥ 2) At least one child dependant No adult dependants Youngest child dependant aged 13-19
Older Couple	Older couple (50-65) 140	Size of family unit = 2 (Q9 = 2) No dependants (Q18 = 0) Age of respondent 50-65
Single Parent	Single parent with child dependants 164	Size of family unit ≥ 2 (Q9 ≥ 2) Only one earner (Q10=1) All dependants are children

Table A - 2 provides the characteristics of the average household in each of the groups used in this study.

Table A - 2: Average characteristics of household groups

	Singles	Young Couple	Older Couple	Single Parent	Single-earner Family	Pre-school Family	Primary School Family	Teenage Family
Number in sample	268	133	140	164	148	204	206	114
Proportion of sample[53]	13.4%	6.7%	7.0%	8.2%	7.4%	10.2%	10.3%	5.7%
Age – Person 1	40.5	28.9	57.7	38.1	39.0	36.0	41.8	48.3
Age – Person 2[1]	N/A	27.7	55.0	N/A	37.0	33.9	40.5	43.3
Number of Dependent Children[4]	0	0	0	2.1	2.1	2.2	2.1	1.5
Age – Child 1	N/A	N/A	N/A	8.9	6.9	5.0	10.9	15.8
Age – Child 2	N/A	N/A	N/A	7.4	6.9	4.2	9.8	14.8
Income – Person 1[5]	$37,991	$48,175	$40,469	$35,637	$51,972	$47,919	$47,179	$48,304
Income – Person 2	N/A	$35,382	$29,546	N/A	$30,201	$30,541	$31,116	$32,370
Median Net Worth[2&3]	$327,500	$155,000	$500,000	$260,000	$295,000	$210,000	$399,500	$383,500

NOTES

1. The age of the other adult was only provided in the survey where that person earns income. For Single-Earner families an age 2 years younger is used for the second person, being the approximate difference for the other groups.

2. The figure for net worth is based on only a small number of respondents (798 of the total 2000) because most did not give all the information necessary to calculate it. Those with a negative net worth (17) were excluded because of doubts about the accuracy of their information.

3. Median Net Worth is used, because the small numbers involved mean that the Mean Net Worth is skewed by one or two very high figures.

4. The ages are given only for children 1 & 2 because the average number of dependent children in all families is 2.

5. Since income is bracketed in the survey, the average is used to calculate the position within the band. For example, for the Single household group the average income is calculated as 5.5982. The band is therefore $35-$40,000. The figure given is simply $35,000 + 0.5982*5000.

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53   There were 623 respondents (31.2% of the sample) that did not fit into any of the specified households.

APPENDIX TWO: IDEAL LEVEL OF INSURANCE FOR HOUSEHOLD GROUPS

Examples of the calculation of the ideal level of insurance within each of the household groups.

SCENARIO ONE – SINGLE WITHOUT DEPENDANTS

In this case there are few needs around death, only sufficient accessible funds for a funeral and clear estate arrangements. However, there are TPD and Trauma needs, as any permanent interruption to the ability to earn a living has a high present value. The level of IP cover will depend on the gap between incomes and benefit level.

(a) *Earner one, age 30, $32,500, net assets $20,000*
Life ideal cover = $0
TPD ideal cover = $50,000
Trauma ideal cover = $50,000
IP ideal cover = $0

(b) *Earner one, age 30, $60,000, net assets $50,000*
Life ideal cover = $0
TPD ideal cover = $300,000
Trauma ideal cover = $50,000
IP ideal cover = $3,700/ mth

(c) *Earner one, age 30, $125,000, net assets $80,000*
Life ideal cover = $0
TPD ideal cover = $800,000
Trauma ideal cover = $52,500
IP ideal cover = $7,500/ mth

SCENARIO TWO - YOUNG COUPLES, UNDER 35, WITHOUT DEPENDANTS

In this case there are generally few needs around death, only sufficient accessible funds for a funeral and clear estate arrangements. There may be life insurance needs if there is a substantial income gap between the couple, and there is a felt need to support the lower earner after death. There will be major TPD, Trauma and IP needs, as any permanent interruption to the ability to earn a living has a high present value, as the uninjured partner cannot easily replace lost income. Note that a non-earner cannot obtain IP cover. We assume the non-earner can return to work earning $32,500.

(a) *Both age 30, earner one, $32,500, earner two, $0, net assets $20,000*
Life ideal cover on earner 1 = $0
TPD ideal cover on earner 1 = $0
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $0

(b) *Both age 30. earner one, $32,500, earner two, $32,500, net assets $20,000*
Life ideal cover on earner 1 & 2 = $115,900, without retirement $86,860
TPD ideal cover on earner 1 = $115,900
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $0
IP ideal cover on earner 2 = $0

(c) *Both age 30, earner one, $60,000, earner two, $0, net assets $50,000*
Life ideal cover on earner 1 = $51,500, without retirement $36,130
TPD ideal cover on earner 1 = $51,000
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth

(d) *Both age 30, earner one, $60,000, earner two, $32,500, net assets $50,000*
Life ideal cover on earner 1 = $300,000, without retirement $250,800
Life ideal cover on earner 2 = $86,000, without retirement $12,000
TPD ideal cover on earner 1 = $300,000
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $0

(e) *Both age 30, earner one, $60,000, earner two, $60,000, net assets $50,000*
Life ideal cover on earner 1 & 2 = $220,000, without retirement $104,000
TPD ideal cover on earner 1 & 2 = $220,000
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $3,700/ mth

(f) *Both age 30, earner one, $125,000, earner two, $0, net assets $80,000*
Life ideal cover on earner 1 = $620,000, without retirement $510,700
TPD ideal cover on earner 1 = $620,000
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth

(g)   *Both age 30, earner one, $125,000, earner two, $32,500, net assets $80,000*
Life ideal cover on earner 1 = $866,000, without retirement $714,000
Life ideal cover on earner 2 = $163,000, without retirement $12,000
TPD ideal cover on earner 1 = $866,000
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $0

(h)   *Both age 30, earner one, $125,000, earner two, $60,000, net assets $80,000*
Life ideal cover on earner 1 = $720,000, without retirement $526,000
Life ideal cover on earner 2 = $204,000, without retirement $12,000
TPD ideal cover on earner 1 = $720,000
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $3,700/ mth

SCENARIO THREE - SINGLE PARENT WITH YOUNGEST CHILD UNDER EIGHTEEN

In this case there are obvious needs for clear estate and child care arrangements as well as sufficient life cover to ensure children have sufficient funds for their guardian to maintain their living standards above orphan benefits of $8,446 p/a until age 18. There is need for TPD cover. We assume there are three children aged 4, 6 & 10. There are needs for cover if the children are permanently disabled. There are, however, restrictions around the availability of life cover to under-18's. There will be no access to IP cover.

(a)   *Earner one, age 30, $32,500, 3 children, net assets $20,000*
Life ideal cover = $12,000
TPD ideal cover = $128,000
Trauma ideal cover = $50,000
IP ideal cover = $0

(b)   *Earner one, age 30, $60,000, 3 children, net assets $50,000*
Life ideal cover = $12,000
TPD ideal cover = $360,000

Trauma ideal cover = $50,000
IP ideal cover = $3,700/ mth

(c)   *Earner one, age 30, $125,000, 3 children, net assets $80,000*
Life ideal cover = $100,000, without retirement $510,700
TPD ideal cover = $850,000
Trauma ideal cover = $52,500
IP ideal cover = $3,700/ mth

SCENARIO FOUR - FAMILY WITH ONE EARNER, CHILDREN OF ANY AGE

In this case there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. Note that levels of cover will be high as any permanent interruption to the ability to earn a living has a high present value. Note that a non-earner cannot obtain IP cover, so trauma is needed. We assume there are three children aged 4, 6 & 10. A key factor will be the ability of the non-earning spouse to return to work full-time. We modelled the survivor not returning to work, and the survivor returning to work part-time when youngest child is 6 and full-time when youngest is 18.

(i)   No return to work

(a)   *Earner one, age 30, $32,500, net assets $20,000*
Life ideal cover = $164,000, without retirement $164,000
TPD ideal cover = $164,000
Trauma ideal cover = $50,000
IP ideal cover = $0

(b)   *Earner one, age 30, $60,000 net assets $50,000*
Life ideal cover = $454,000, without retirement $430,000
TPD ideal cover = $454,000
Trauma ideal cover = $50,000
IP ideal cover = $3,700/ mth

(c)   *Earner one, age 30, $125,000 net assets $80,000*
Life ideal cover = $1,090,000, without retirement $980,000
TPD ideal cover = $1,090,000
Trauma ideal cover = $52,500
IP ideal cover = $6,600/ mth

(ii) Return to work

(d) *Earner one, age 30, $32,500, net assets $20,000*
Life ideal cover = $18,000, without retirement $18,000
TPD ideal cover = $164,000
Trauma ideal cover = $50,000
IP ideal cover = $0

(e) *Earner one, age 30, $60,000 net assets $50,000*
Life ideal cover = $168,000, without retirement $144,000
TPD ideal cover = $454,000
Trauma ideal cover = $50,000
IP ideal cover = $3,700/ mth

(f) *Earner one, age 30, $125,000 net assets $80,000*
Life ideal cover = $803,000, without retirement $693,000
TPD ideal cover = $1,090,000
Trauma ideal cover = $52,500
IP ideal cover = $6,600/ mth

SCENARIO FIVE - COUPLES WITH TWO EARNERS, TWO CHILDREN, YOUNGEST UNDER FIVE

In this case there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. We assume there are three children aged 4, 6 & 10. Note that levels of cover will be high, but not as high as scenario four, and will vary depending on the level of asymmetry between the couple in earning ability.

(a) *Both age 30, earner one, $32,500, earner two, $32,500, net assets $20,000*
Life ideal cover on earner 1 & 2 = $187,000, without retirement $142,050
TPD ideal cover on earner 1 & 2 = $187,000
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $0
IP ideal cover on earner 2 = $0

(b) *Both age 30, earner one, $60,000, earner two, $32,500, net assets $50,000*
Life ideal cover on earner 1 = $434,500, without retirement $360,550
Life ideal cover on earner 2 = $133,000, without retirement $79,000

TPD ideal cover on earner 1 = $434,000
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $0

(c) *Both age 30, earner one, $60,000, earner two, $60,000, net assets $50,000*
Life ideal cover on earner 1 & 2 = $382,200, without retirement $267,000
TPD ideal cover on earner 1 & 2 = $382,000
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $3,700/ mth

(d) *Both age 30, earner one, $125,000, earner two, $32,500, net assets $80,000*
Life ideal cover on earner 1 = $1,013,000, without retirement $267,000
Life ideal cover on earner 2 = $164,000, without retirement $12,000
TPD ideal cover on earner 1 = $1,013,000
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $0

(e) *Both age 30, earner one, $125,000, earner two, $60,000, net assets $80,000*
Life ideal cover on earner 1 = $951,700, without retirement $760,190
Life ideal cover on earner 2 = $285,100, without retirement $95,000
TPD ideal cover on earner 1 = $951,700
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $3,700/ mth

SCENARIO SIX - COUPLES WITH TWO EARNERS, THREE CHILDREN, YOUNGEST BETWEEN 5-12

In this case there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. Note that levels of cover will be high, but not as high as scenario four, and will vary depending on the level of asymmetry between the couple in earning ability. We assume there are three children aged 8, 12 & 16.

(a) Both age 35, earner one, $32,500, earner two, $32,500, net assets $20,000
Life ideal cover on earner 1 & 2 = $164,780, without retirement $108,700
TPD ideal cover on earner 1 & 2 = $164,700
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $0
IP ideal cover on earner 2 = $0

(b) Both age 35, earner one, $60,000, earner two, $32,500, net assets $50,000
Life ideal cover on earner 1 = $394,400, without retirement $301,900
Life ideal cover on earner 2 = $137,120
TPD ideal cover on earner 1 = $394,400
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $0

(c) Both age 35, earner one, $60,000, earner two, $60,000, net assets $50,000
Life ideal cover on earner 1 & 2= $340,000, without retirement $198,000
TPD ideal cover on earner 1 & 2 = $340,000
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $3,700/ mth

(d) Both age 35, earner one, $125,000, earner two, $32,500, net assets $80,000
Life ideal cover on earner 1 = $933,800, without retirement $745,000
Life ideal cover on earner 2 = $200,760 without retirement $12,000
TPD ideal cover on earner 1 = $933,800
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $0

(e) Both age 35, earner one, $125,000, earner two, $60,000, net assets $80,000
Life ideal cover on earner 1 = $870,600, without retirement $633,800
Life ideal cover on earner 2 = $284,680, without retirement $47,900
TPD ideal cover on earner 1 = $610,000
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $3,700/ mth

SCENARIO SEVEN - COUPLES WITH TWO EARNERS, THREE CHILDREN, YOUNGEST CHILD BETWEEN 13- 18

In this case there are obvious needs for substantial life and TPD cover, as well as clear estate arrangements. There will also be major Trauma and IP needs. Note that levels of cover will be high, but not as high as scenario four or five, and will vary depending on the level of asymmetry between the couple in earning ability. We assume there are three children aged 14, 18 & 22.

(a) Both age 40, earner one, $32,500, earner two, $32,500, net assets $20,000
Life ideal cover on earner 1 & 2 = $158,700, without retirement $89,500
TPD ideal cover on earner 1 & 2 = $158,700
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $0
IP ideal cover on earner 2 = $0

(b) Both age 40, earner one, $60,000, earner two, $32,500, net assets $50,000
Life ideal cover on earner 1 = $371,400, without retirement $256,000
Life ideal cover on earner 2 = $138,300, without retirement $23,300
TPD ideal cover on earner 1 = $371,400
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $0

(c) Both age 40, earner one, $60,000, earner two, $60,000, net assets $50,000
Life ideal cover on earner 1 & 2 = $311,390, without retirement $135,990
TPD ideal cover on earner 1 & 2 = $311,390
Trauma ideal cover on each = $50,000
IP ideal cover on earner 1 = $3,700/ mth
IP ideal cover on earner 2 = $3,700/ mth

(d) Both age 40, earner one, $125,000, earner two, $0, net assets $80,000
Life ideal cover on earner 1 = $650,360, without retirement $478,170
TPD ideal cover on earner 1 = $651,360
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth

(e)   Both age 40, earner one, $125,000, earner two, $32,500, net assets $80,000
      Life ideal cover on earner 1 = $883,250, without retirement $640,144
      Life ideal cover on earner 2 = $245,630, without retirement $12,000
      TPD ideal cover on earner 1 = $883,250
      Trauma ideal cover on each = $52,500
      IP ideal cover on earner 1 = $6,600/ mth
      IP ideal cover on earner 2 = $0

(f)   Both age 40, earner one, $125,000, earner two, $60,000, net assets $80,000
      Life ideal cover on earner 1 = $804,570, without retirement $512,630
      Life ideal cover on earner 2 = $313,840, without retirement $21,890
      TPD ideal cover on earner 1 = $804,570
      Trauma ideal cover on each = $52,500
      IP ideal cover on earner 1 = $6,600/ mth
      IP ideal cover on earner 2 = $3,700/ mth

SCENARIO EIGHT - OLDER COUPLE, AGED 50-65, WITH ADULT CHILDREN, NO DEPENDANTS

In this case there are substantially lower needs around death, only sufficient accessible funds for coverage of any income gap to retirement of the survivor, a funeral and clear estate arrangements. This will vary depending on the level of asymmetry between the couple in earning ability, and the funds available to support retirement. There will be lesser TPD, Trauma and IP needs, as any permanent interruption to the ability to earn a living will have a lower present value. Note that the majority of the life insurance sum is to secure retirement income, and as retirement is closer the future value of the net assets saved is lower, so the life sum increases. The sum required sustaining the present standard of living in retirement should have been substantially secured at this stage with higher investments than we assume, (and the life sums listed may not be offered in practice) so life sums without retirement investments are also listed. There will be an increasing issue with escalating premium costs.

(a)   Both age 55, earner one, $32,500, earner two, $0, net assets $20,000
      Life ideal cover on earner 1 = $12,000, without retirement $12,000

      TPD ideal cover on earner 1 = $0
      Trauma ideal cover on each = $50,000
      IP ideal cover on earner 1 = $0

(b)   Both age 55, earner one, $32,500, earner two, $32,500, net assets $20,000
      Life ideal cover on earner 1 & 2 = $179,000, without retirement $51,450
      TPD ideal cover on earner 1 & 2 = $179,000
      Trauma ideal cover on each = $50,000
      IP ideal cover on earner 1 = $0
      IP ideal cover on earner 2 = $0

(c)   Both age 55, earner one, $60,000, earner two, $0, net assets $50,000
      Life ideal cover on earner 1 = $109,760, without retirement $24,700
      TPD ideal cover on earner 1 = $109,700
      Trauma ideal cover on each = $50,000
      IP ideal cover on earner 1 = $3,700/ mth

(d)   Both age 55, earner one, $60,000, earner two, $32,500, net assets $50,000
      Life ideal cover on earner 1 = $354,900, without retirement $137,980
      Life ideal cover on earner 2 = $229,060, without retirement $12,000
      TPD ideal cover on earner 1 = $354,900
      Trauma ideal cover on each = $50,000
      IP ideal cover on earner 1 = $3,700/ mth
      IP ideal cover on earner 2 = $0

(e)   Both age 55, earner one, $60,000, earner two, $60,000, net assets $50,000
      Life ideal cover on earner 1 & 2 = $379,000, without retirement $54,500
      TPD ideal cover on earner 1 & 2 = $379,000
      Trauma ideal cover on each = $50,000
      IP ideal cover on earner 1 = $3,700/ mth
      IP ideal cover on earner 2 = $3,700/ mth

(f)   Both age 55, earner one, $125,000, earner two, $0, net assets $80,000
      Life ideal cover on earner 1 = $567,000, without retirement $241,000
      TPD ideal cover on earner 1 = $567,000
      Trauma ideal cover on each = $52,500
      IP ideal cover on earner 1 = $6,600/ mth

(g) *Both age 55, earner one, $125,000, earner two, $32,500, net assets $80,000*
Life ideal cover on earner 1 = $772,000, without retirement $335,950
Life ideal cover on earner 2 = $448,130, without retirement $12,000
TPD ideal cover on earner 1 = $790,000
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $0

(h) *Both age 55, earner one, $125,000, earner two, $60,000, net assets $80,000*
Life ideal cover on earner 1 = $790,000, without retirement $250,450
Life ideal cover on earner 2 = $552,580, without retirement $12,000
TPD ideal cover on earner 1 = $790,000
Trauma ideal cover on each = $52,500
IP ideal cover on earner 1 = $6,600/ mth
IP ideal cover on earner 2 = $3,700/ mth
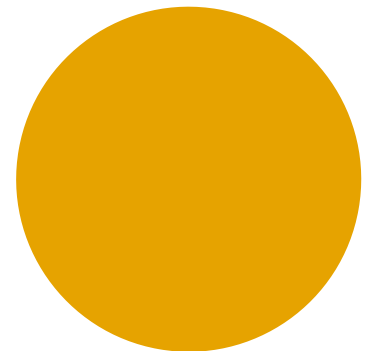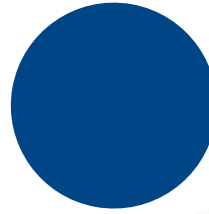
SENSITIVITY ANALYSIS

The results of models are only as good as the assumptions. The issue for research is not the realism of the assumptions but their robustness. The key assumptions in our model are:

- Death at age 90
- Sum required for retirement
- Growth rate of consumption (C) = growth rate of survivors income (Y) = 1.0% p/a. Note that benefits are tied to this rate. This is based on average growth in national real income.
- Real return on investments = 3.0% p/a
- Time discount = 5.0% p/a
- To test of the sensitivity of our life insurance model we will vary a number of the assumptions, using two of the above scenarios.

CASE 1 – COUPLE BOTH AGE 30, EARNER ONE, $60,000, EARNER TWO, $32,000, NET ASSETS $50,000, THREE CHILDREN AGED 4, 6 & 10

Life ideal cover on earner 1	= $434,520	
Changing age of death to 80, then life sum	= $413,120	(4.9%)
Life sum without retirement	= $360,550	(17.0%)
Two children aged 6 & 10 - life sum	= $429,314	(1.2%)
Growth rate of C at 0.0%, Y at 1.0%	= $308,280	(29.1%)
Growth rate of C at 0.0%, Y at 0.0%	= $360,000	(17.1%)
Growth rate of C at 2.0%, Y at 2.0%	= $538,000	23.8%
Growth rate of C at 2.0%, Y at 1.0%	= $602,000	38.5%
Real return on investments at 2.0% p/a	= $442,850	1.9%
Time discount at 4.0% p/a	= $523,040	20.4%
Time discount at 6.0% p/a	= $370,140	(1.8%)

CASE 2 - COUPLE BOTH AGE 40, EARNER ONE, $60,000, EARNER TWO, $0, NET ASSETS $50,000 THREE CHILDREN AGED 14, 18 & 22

Life ideal cover on earner 1	= $100,350	
Changing age of death to 80	= $92,093	(8.2%)
Life sum without retirement	= $59,000	(41.2%)
Two children aged 22 & 18	= $89,020	(11.3%)
Growth rate of C at 0.0%, Y at 1.0%	= $86,464	(13.8%)
Growth rate of C at 0.0%, Y at 0.0%	= $86,838	(13.5%)
Growth rate of C at 2.0%, Y at 2.0%	= $119,960	19.5%
Growth rate of C at 2.0%, Y at 1.0%	= $99,965	(0.0%)
Real return on investments at 2.0% p/a	= $108,672	8.3%
Time discount at 4.0% p/a	= $113,024	12.0%
Time discount at 6.0% p/a	= $109,183	8.7%

As can be seen from these examples, changing the age of death has very little impact, as changes to sums have a low present value. Similarly, there is little impact from changing the real rate of return on investments, as asset levels are low and any retirement income has a low present value. Changing the rate of time discount does have some impact, as would be expected. Similarly changing the assumed growth rate of survivor income has an impact, as does the assumed growth rates of consumption. Note the latter affects growth in benefit and NZ super rates. However the impact of these changes are not substantial. Overall the scenarios are robust, with low sensitivity to most assumptions.

Our ideal life/ TPD cover sums are thus to be regarded as ball-park figures with an expected variance of ± 20% around our calculated value. Note that for the older age group assumptions around NZ Super will have more impact and for the richer age group assumptions about benefit growth rate levels will have a lesser impact.

APPENDIX THREE: DETAILED EXAMPLES OF INSURANCE COVER CALCULATIONS

As an aid to understanding the ideal insurance model used the insurance needs of the two household groups are outlined in more detail, the pre-school family and the teenage family, using averages from the survey.[54]

The assumptions are:
- the survivor, if working, is assumed to continue
- children are assumed dependant until age 19
- full welfare entitlements are used if eligible, DPB is $18,035 p/a net, NZ superannuation is $17,649 net for a single.
- remarriage is ignored.
- death is at age 90.
- consumption and income increase at 1.0%, time is discounted at 5.0%.
- the ending of the current mortgage is ignored as payments will then be directed into retirement savings.
- the survivor is assumed to require 60% of pre-tragedy income and each child 10%.
- tertiary education needs have not been allowed for.
- possible future increase in income and the extra consumption is ignored, so future post-tragedy consumption is based on current. As the couple ages the needs approach would show a lower life-insurance requirement every year.

PRE-SCHOOL FAMILY, TWO EARNERS

The couple have a very low capacity to cope with risk, due to the age of the children and the inability of the wife to fully replace the husband's wage. They have high insurance needs, but limited surplus income. To cover the full range of insurance products that they require, as well as cover retirement savings, the amount that they pay in premiums needs to be cut back as much as possible. However, their limited liquid assets restrict the ability of the couple to cope with any financial shocks so that use of deductions and waiting times will have limited flexibility. Family income is $78,460, ages are 36, 34, 5 & 4 and net wealth (including house) is $210,000. If the main earning (older) spouse dies then the surviving spouse has 15 years until the youngest child is age 19, and a current annual income deficit of

$29,850. They have a life insurance need on the main earner until age 65 of $457,174 and a retirement need of $63,941. The main earning spouse has trauma insurance need of $50,000 and income protection need of $2,995/mth. The secondary earner has a trauma insurance need of the minimum level of $50,000 and income protection insurance of $1,909 /mth. The details are outlined in Table A - 3.

An income multiple 5x approach would give a life cover of $239,595, and a debt approach would solely cover the mortgage and any short-term debts. Both ignore actual needs.

TEENAGE FAMILY

The couple have a higher capacity to cope with risk, due to the older age of the children and the ability of the wife to partly replace the husband's wage. Their higher level of net wealth also increases financial flexibility. Family income is $80,674, ages are 49, 43, 16 & 15 and net wealth (including house) is $383,500. If the main earning (older) spouse dies then the surviving spouse has 4 years until the youngest child is age 19, and a current annual income deficit of $31,073. They have a life insurance need on the main earner until age 65 of $299,039 and a retirement need of $59,603. The main earning spouse has trauma insurance need of $50,000 and income protection need of $3,019/mth. The secondary earner has a trauma insurance need of the minimum level of $50,000 and income protection insurance of $2,023 /mth. The details are outlined in Table A - 4.

An income multiple 5x approach would give a life cover of $241,520, and a debt approach would solely cover the mortgage and any short-term debts. Both ignore actual needs.

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54 See Table A - 2 for the average characteristics used.

Table A - 3: Life insurance calculation for average pre-school family

Figures are $ real

Changeable variables

Age Survivor	34
Age Child 1	5
Age Child 2	4
Household pretragedy / net consumption	$78,460
Survivor current net income	$30,541
Non working survivor possible net income	$30,541
Deceased spouse gross income	$47,919
DPB / Widows Benefit w childcare	$18,035
Orphans Benfit / child	$8,446
Growth rate of consumption	1.0%
Growth rate of survivor's income	1.0%
NZ Superannuation now	$17,648
Age Child independance	19
Financial assets now	$210,000
Debts now	$0
Real return on investment to retirement	3.0%
Age of death (inclusive)	90
Time Discount	5.0%
Funeral costs	$12,000

Nonchangeable Results

Present Y value =	$509,115
Funeral costs =	$12,000
Life sum wo retirement =	$457,174
Retirement sum =	$63,941
Life sum =	$521,115
Trauma sum on e1 =	$50,000
IP monthly on e1 =	$2,995
Trauma sum on e2 =	$50,000
IP monthly on e2 =	$1,909
Investments at retirement =	$708,358
Income from investments at ret =	$21,251

Assumptions

- DPB is rebated at 30% for income earned between $5,201 and $10,400 at 70% over that
- Children independent at 18
- DPB, Orphans & Super increase at consumption growth
- Adult at 60% with an additional 20% for children proportional to number dependent
- Non-earning spouse works part-time when youngest child 6
- Non-earning spouse works full-time when youngest child 18
- Retirement Lump sum included
- Rebated benefit after 65 is NZ Super
- Inv Y increases after retirement at CGrowth
- Trauma at $50k min or 6months life insured
- IP at 75% of net income of life insured

Year	Age-independent from set age, so not included			Income needs	Welfare benefit	Income from employment	Retirement Investments	Rebated benefit	NZ Super	Income deficit	Retirement deficit	5% discount factor	PV Inc deficit	PV Ret deficit
	Survivor	Child 1	Child 2											
1	34	5	4	$62,768	$18,035	$30,541	$0	$2,377	$0	$29,850	$0	0.9524	$28,429	$0
2	35	6	5	$64,030	$18,398	$31,155	$0	$2,309	$0	$30,565	$0	0.9070	$27,724	$0
3	36	7	6	$64,670	$18,581	$31,466	$0	$2,275	$0	$30,928	$0	0.8638	$26,717	$0
4	37	8	7	$65,317	$18,767	$31,781	$0	$2,241	$0	$31,295	$0	0.8227	$25,746	$0
5	38	9	8	$65,970	$18,955	$32,099	$0	$2,206	$0	$31,665	$0	0.7835	$24,810	$0
6	39	10	9	$66,629	$19,145	$32,420	$0	$2,171	$0	$32,039	$0	0.7462	$23,908	$0
7	40	11	10	$67,296	$19,336	$32,744	$0	$2,135	$0	$32,416	$0	0.7107	$23,038	$0
8	41	12	11	$67,969	$19,529	$33,072	$0	$2,100	$0	$32,798	$0	0.6768	$22,199	$0
9	42	13	12	$68,648	$19,725	$33,402	$0	$2,063	$0	$33,183	$0	0.6446	$21,390	$0
10	43	14	13	$69,335	$19,922	$33,736	$0	$2,027	$0	$33,572	$0	0.6139	$20,610	$0
11	44	15	14	$70,028	$20,121	$34,074	$0	$1,990	$0	$33,965	$0	0.5847	$19,859	$0
12	45	16	15	$70,729	$20,322	$34,414	$0	$1,953	$0	$34,362	$0	0.5568	$19,134	$0
13	46	17	16	$71,436	$20,526	$34,759	$0	$1,915	$0	$34,762	$0	0.5303	$18,435	$0
14	47	18	17	$72,150	$20,731	$35,106	$0	$1,877	$0	$35,167	$0	0.5051	$17,762	$0
15	48	0	18	$63,763	$20,938	$35,457	$0	$1,838	$0	$26,467	$0	0.4810	$12,731	$0
16	49	0	0	$55,200	$0	$35,812	$0	$0	$0	$19,389	$0	0.4581	$8,882	$0
17	50	0	0	$55,752	$0	$36,170	$0	$0	$0	$19,582	$0	0.4363	$8,544	$0
18	51	0	0	$56,310	$0	$36,532	$0	$0	$0	$19,778	$0	0.4155	$8,218	$0
19	52	0	0	$56,873	$0	$36,897	$0	$0	$0	$19,976	$0	0.3957	$7,905	$0
20	53	0	0	$57,442	$0	$37,266	$0	$0	$0	$20,176	$0	0.3769	$7,604	$0
21	54	0	0	$58,016	$0	$37,638	$0	$0	$0	$20,378	$0	0.3589	$7,314	$0
22	55	0	0	$58,596	$0	$38,015	$0	$0	$0	$20,581	$0	0.3418	$7,036	$0
23	56	0	0	$59,182	$0	$38,395	$0	$0	$0	$20,787	$0	0.3256	$6,768	$0
24	57	0	0	$59,774	$0	$38,779	$0	$0	$0	$20,995	$0	0.3101	$6,510	$0
25	58	0	0	$60,372	$0	$39,167	$0	$0	$0	$21,205	$0	0.2953	$6,262	$0
26	59	0	0	$60,975	$0	$39,558	$0	$0	$0	$21,417	$0	0.2812	$6,023	$0
27	60	0	0	$61,585	$0	$39,954	$0	$0	$0	$21,631	$0	0.2678	$5,794	$0
28	61	0	0	$62,201	$0	$40,354	$0	$0	$0	$21,848	$0	0.2551	$5,573	$0
29	62	0	0	$62,823	$0	$40,757	$0	$0	$0	$22,066	$0	0.2429	$5,361	$0
30	63	0	0	$63,451	$0	$41,165	$0	$0	$0	$22,287	$0	0.2314	$5,157	$0
31	64	0	0	$64,086	$0	$41,576	$0	$0	$0	$22,510	$0	0.2204	$4,960	$0
32	65	0	0	$64,727	$0	$41,992	$0	$0	$0	$22,735	$0	0.2099	$4,771	$0
33	66	0	0	$65,374	$0	$0	$21,251	$0	$24,508	$0	$19,616	0.1999	$0	$3,921
34	67	0	0	$66,028	$0	$0	$21,463	$0	$24,753	$0	$19,812	0.1904	$0	$3,771
35	68	0	0	$66,688	$0	$0	$21,678	$0	$25,000	$0	$20,010	0.1813	$0	$3,628
36	69	0	0	$67,355	$0	$0	$21,895	$0	$25,250	$0	$20,210	0.1727	$0	$3,489
37	70	0	0	$68,028	$0	$0	$22,114	$0	$25,503	$0	$20,412	0.1644	$0	$3,356
38	71	0	0	$68,709	$0	$0	$22,335	$0	$25,758	$0	$20,616	0.1566	$0	$3,229
39	72	0	0	$69,396	$0	$0	$22,558	$0	$26,015	$0	$20,822	0.1491	$0	$3,106
40	73	0	0	$70,090	$0	$0	$22,784	$0	$26,275	$0	$21,031	0.1420	$0	$2,987
41	74	0	0	$70,791	$0	$0	$23,012	$0	$26,538	$0	$21,241	0.1353	$0	$2,874
42	75	0	0	$71,499	$0	$0	$23,242	$0	$26,804	$0	$21,453	0.1288	$0	$2,764
43	76	0	0	$72,214	$0	$0	$23,474	$0	$27,072	$0	$21,668	0.1227	$0	$2,659
44	77	0	0	$72,936	$0	$0	$23,709	$0	$27,342	$0	$21,885	0.1169	$0	$2,557
45	78	0	0	$73,665	$0	$0	$23,946	$0	$27,616	$0	$22,103	0.1113	$0	$2,460
46	79	0	0	$74,402	$0	$0	$24,185	$0	$27,892	$0	$22,324	0.1060	$0	$2,366
47	80	0	0	$75,146	$0	$0	$24,427	$0	$28,171	$0	$22,548	0.1009	$0	$2,276
48	81	0	0	$75,897	$0	$0	$24,671	$0	$28,453	$0	$22,773	0.0961	$0	$2,189
49	82	0	0	$76,656	$0	$0	$24,918	$0	$28,737	$0	$23,001	0.0916	$0	$2,106
50	83	0	0	$77,423	$0	$0	$25,167	$0	$29,024	$0	$23,231	0.0872	$0	$2,026
51	84	0	0	$78,197	$0	$0	$25,419	$0	$29,315	$0	$23,463	0.0831	$0	$1,949
52	85	0	0	$78,979	$0	$0	$25,673	$0	$29,608	$0	$23,698	0.0791	$0	$1,874
53	86	0	0	$79,769	$0	$0	$25,930	$0	$29,904	$0	$23,935	0.0753	$0	$1,803
54	87	0	0	$80,566	$0	$0	$26,189	$0	$30,203	$0	$24,174	0.0717	$0	$1,734
55	88	0	0	$81,372	$0	$0	$26,451	$0	$30,505	$0	$24,416	0.0683	$0	1,668
56	89	0	0	$82,186	$0	$0	$26,716	$0	$30,810	$0	$24,660	0.0651	$0	1,605
57	90	0	0	$83,008	$0	$0	$26,983	$0	$31,118	$0	$24,907	0.0620	$0	1,544

Table A - 4: Life insurance calculation for average teenage family household

Figures are $ real

Changeable variables

Age Survivor	43
Age Child 1	16
Age Child 2	15
Household pretragedy / net consumption	$80,674
Survivor current net income	$32,370
Non working survivor possible net income	$30,541
Deceased spouse gross income	$48,304
DPB / Widows Benefit w childcare	$18,035
Orphans Benfit / child	$8,446
Growth rate of consumption	1.0%
Growth rate of survivor's income	1.0%
NZ Superannuation now	$17,648
Age Child independance	19
Financial assets now	$383,500
Debts now	$0
Real return on investment to retirement	3.0%
Age of death (inclusive)	90
Time Discount	5.0%
Funeral costs	$12,000

Nonchangeable Results

Present Y value =	$350,170
Funeral costs =	$12,000
Life sum wo retirement =	$302,567
Retirement sum =	$59,603
Life sum =	$362,170
Trauma sum on e1 =	$50,000
IP monthly on e1 =	$3,019
Trauma sum on e2 =	$50,000
IP monthly on e2 =	$2,023
Investments at retirement =	$908,864
Income from investments at ret =	$27,266

Assumptions
- DPB is rebated at 30% for income earned between $5,201 and $10,400 at 70% over that
- Children independent at 18
- DPB, Orphans & Super increase at consumption growth
- Adult at 60% with an additional 20% for children proportional to number dependent
- Non-earning spouse works part-time when youngest child 6
- Non-earning spouse works full-time when youngest child 18
- Retirement Lump sum included
- Rebated benefit after 65 is NZ Super
- Inv Y increases after retirement at CGrowth
- Trauma at $50k min or 6months life insured
- IP at 75% of net income of life insured

Year	Survivor	Child 1	Child 2	Income needs	Welfare benefit	Income from employment	Retirement Investments	Rebated benefit	NZ Super	Income deficit	Retirement deficit	5% discount factor	PV Inc deficit	PV Ret deficit
1	43	16	15	$64,539	$18,035	$32,370	$0	$0	$0	$32,169	$0	0.9524	$30,637	$0
2	44	17	16	$65,836	$18,398	$33,021	$0	$0	$0	$32,816	$0	0.9070	$29,765	$0
3	45	18	17	$66,495	$18,581	$33,351	$0	$0	$0	$33,144	$0	0.8638	$28,631	$0
4	46	0	18	$58,765	$18,767	$33,684	$0	$0	$0	$25,080	$0	0.8227	$20,634	$0
5	47	0	0	$50,874	$0	$34,021	$0	$0	$0	$16,852	$0	0.7835	$13,204	$0
6	48	0	0	$51,382	$0	$34,361	$0	$0	$0	$17,021	$0	0.7462	$12,701	$0
7	49	0	0	$51,896	$0	$34,705	$0	$0	$0	$17,191	$0	0.7107	$12,217	$0
8	50	0	0	$52,415	$0	$35,052	$0	$0	$0	$17,363	$0	0.6768	$11,752	$0
9	51	0	0	$52,939	$0	$35,403	$0	$0	$0	$17,537	$0	0.6446	$11,304	$0
10	52	0	0	$53,469	$0	$35,757	$0	$0	$0	$17,712	$0	0.6139	$10,874	$0
11	53	0	0	$54,003	$0	$36,114	$0	$0	$0	$17,889	$0	0.5847	$10,459	$0
12	54	0	0	$54,543	$0	$36,475	$0	$0	$0	$18,068	$0	0.5568	$10,061	$0
13	55	0	0	$55,089	$0	$36,840	$0	$0	$0	$18,249	$0	0.5303	$9,678	$0
14	56	0	0	$55,640	$0	$37,208	$0	$0	$0	$18,431	$0	0.5051	$9,309	$0
15	57	0	0	$56,196	$0	$37,581	$0	$0	$0	$18,615	$0	0.4810	$8,954	$0
16	58	0	0	$56,758	$0	$37,956	$0	$0	$0	$18,802	$0	0.4581	$8,613	$0
17	59	0	0	$57,326	$0	$38,336	$0	$0	$0	$18,990	$0	0.4363	$8,285	$0
18	60	0	0	$57,899	$0	$38,719	$0	$0	$0	$19,180	$0	0.4155	$7,969	$0
19	61	0	0	$58,478	$0	$39,106	$0	$0	$0	$19,371	$0	0.3957	$7,666	$0
20	62	0	0	$59,063	$0	$39,498	$0	$0	$0	$19,565	$0	0.3769	$7,374	$0
21	63	0	0	$59,653	$0	$39,893	$0	$0	$0	$19,761	$0	0.3589	$7,093	$0
22	64	0	0	$60,250	$0	$40,291	$0	$0	$0	$19,958	$0	0.3418	$6,823	$0
23	65	0	0	$60,852	$0	$40,694	$0	$0	$0	$20,158	$0	0.3256	$6,563	$0
24	66	0	0	$61,461	$0	$0	$27,266	$0	$22,408	$0	$11,787	0.3101	$0	$3,655
25	67	0	0	$62,075	$0	$0	$27,539	$0	$22,632	$0	$11,904	0.2953	$0	$3,515
26	68	0	0	$62,696	$0	$0	$27,814	$0	$22,859	$0	$12,023	0.2812	$0	$3,381
27	69	0	0	$63,323	$0	$0	$28,092	$0	$23,087	$0	$12,144	0.2678	$0	$3,253
28	70	0	0	$63,956	$0	$0	$28,373	$0	$23,318	$0	$12,265	0.2551	$0	$3,129
29	71	0	0	$64,596	$0	$0	$28,657	$0	$23,551	$0	$12,388	0.2429	$0	$3,010
30	72	0	0	$65,242	$0	$0	$28,943	$0	$23,787	$0	$12,512	0.2314	$0	$2,895
31	73	0	0	$65,894	$0	$0	$29,233	$0	$24,025	$0	$12,637	0.2204	$0	$2,785
32	74	0	0	$66,553	$0	$0	$29,525	$0	$24,265	$0	$12,763	0.2099	$0	$2,679
33	75	0	0	$67,219	$0	$0	$29,820	$0	$24,508	$0	$12,891	0.1999	$0	$2,577
34	76	0	0	$67,891	$0	$0	$30,119	$0	$24,753	$0	$13,020	0.1904	$0	$2,478
35	77	0	0	$68,570	$0	$0	$30,420	$0	$25,000	$0	$13,150	0.1813	$0	$2,384
36	78	0	0	$69,256	$0	$0	$30,724	$0	$25,250	$0	$13,281	0.1727	$0	$2,293
37	79	0	0	$69,948	$0	$0	$31,031	$0	$25,503	$0	$13,414	0.1644	$0	$2,206
38	80	0	0	$70,648	$0	$0	$31,341	$0	$25,758	$0	$13,548	0.1566	$0	$2,122
39	81	0	0	$71,354	$0	$0	$31,655	$0	$26,015	$0	$13,684	0.1491	$0	$2,041
40	82	0	0	$72,068	$0	$0	$31,971	$0	$26,275	$0	$13,821	0.1420	$0	$1,963
41	83	0	0	$72,788	$0	$0	$32,291	$0	$26,538	$0	$13,959	0.1353	$0	$1,888
42	84	0	0	$73,516	$0	$0	$32,614	$0	$26,804	$0	$14,098	0.1288	$0	$1,816
43	85	0	0	$74,251	$0	$0	$32,940	$0	$27,072	$0	$14,239	0.1227	$0	$1,747
44	86	0	0	$74,994	$0	$0	$33,270	$0	$27,342	$0	$14,382	0.1169	$0	$1,681
45	87	0	0	$75,744	$0	$0	$33,602	$0	$27,616	$0	$14,526	0.1113	$0	$1,617
46	88	0	0	$76,501	$0	$0	$33,938	$0	$27,892	$0	$14,671	0.1060	$0	$1,555
47	89	0	0	$77,266	$0	$0	$34,278	$0	$28,171	$0	$14,818	0.1009	$0	$1,496
48	90	0	0	$78,039	$0	$0	$34,620	$0	$28,453	$0	$14,966	0.0961	$0	$1,439

APPENDIX FOUR: THE EXTENT OF INTERNATIONAL UNDERINSURANCE

The extent of non- and underinsurance for health has been extensively researched within the USA, though until 1999 this focused on non-insurance rather than underinsurance. For example, Monheit (1994) found that in 1987 17% of Americans had no health insurance, and non-insurance rates were highest amongst the young (30%), ethnic minorities (32%) and the poor (39%). It needs to be noted that the issues around health insurance, especially in the USA, are generally quite different from the issues surrounding personal non-health insurance within New Zealand.

Bernheim, Forni, Gokhale and Kotlikoff (1999) were one of the first to examine life underinsurance systematically. They used the 1992 US Health and Retirement survey and found that for life insurance, a sizable minority of couples were significantly underinsured, with about 32% of wives and 10% of husbands facing at least a 20% drop in their post-tragedy adjusted standard of living if their spouse had died. Underinsurance was more common among low income households, couples with asymmetrical earnings, younger households, couples with dependent children and non-whites. Non-earners within a household were particularly vulnerable, with 20% of non-earners severely underinsured. Within some groups underinsurance exceeded 70%, with 25% facing a severe drop in living standards of greater than 40%. Underinsurance declined as income rose, however for some groups the degree of underinsurance increased with income. More than 70% of the under-40s were underinsured, compared to 34% for over 60s, despite their greater need to protect human capital. Similarly 66% of households with dependent children were underinsured, compared to 50% of other households. There was a strong ethnic relationship (after adjusting for income) with three times as many non-white husbands underinsured compared to whites, with 25% severely underinsured. While similar conclusions were found in prior studies by Auerbach and Kotlikoff (1987, 1989, 1991a, 1991b) and Hurd and Wise (1989), these had methodological and data shortcomings.

Gokhale and Kotlikoff (2002) used an economic life-cycle approach, based on Yaari (1965) and Lewis (1989), and found that underinsurance was widespread in the USA on the life of the primary earner. Bernheim et al (2003) found that life insurance holdings and financial vulnerabilities were essentially uncorrelated, indicating insurance was purchased with little analysis of actual need and hardly ever adjusted. Using a partial equilibrium approach they did find a tendency for the most vulnerable households to hold the least life insurance; underinsurance was highest amongst couples under 39, with 2/3 of secondary earners facing a drop on living standards exceeding at least 20%, and 1/3 facing at least a 40% drop. Given that these secondary earners were predominately female these meant that about 2/3 of poverty (as they defined it) amongst widows resulted from inadequate life insurance on their deceased husband. However, the most severe underinsurance occurred for those men who were secondary earners, with very little insurance held on the wives' lives. In contrast, the lives of secondary earners were well-insured, resulting in only small drops in living standards for the surviving primary earner. Fitzgerald (1989) finds strong inertia in holdings, with sums insured not decreasing with age so that husbands who are older than 60 hold adequate or excessive insurance on their lives, but younger husbands do not.

This gap between the insurance cover by gender was also found by Gandolfi and Miners (1996). They found that the re-employment prospects of an at-home wife are factored into the life coverage decision, with an increase in the wife's income or education reducing coverage. The size of the family is the main determinant of coverage level on the wife's life. This result was confirmed by Hong and Rios-Rull (2004).

Chen, Wong and Lee (2001) find that life holdings in the USA has declined for successive population cohorts since 1980, with the decline particularly strong for coverage of males, indicating that cultural preferences for financial security are changing.

Chambers, Schlagenhauf and Young (2003a) applied a comprehensive overlapping generation general equilibrium approach using generalised preference functions to 1998 USA survey data and found that actuarially adjusted insurance holdings were too low for younger couples, especially for single parent households. Participation also varied positively with income and wealth, resulting in some wealthier or older households holding excessive life cover. They, however, failed to distinguish between the genders.

Mitchel (2003), in association with LIMRA International, examined 4,000 Americans from the Federal Reserve Board's Survey of Consumer Finances, and found that 22% of those families surveyed had no life cover at all – note that most Americans obtain life cover via their workplace. They found that the average life cover for respondents was $126,000, covering 3.6 years income, and LIMRA considered this inadequate compared to their ideal average cover of $459,000. They calculated ideal cover for each family sampled using the average from two different methods; the capital needs approach and the human capitalized value approach. They found that households with income over $100,000 and older had adequate levels of cover, whilst middle income households had about 15% of recommended cover. In general, cover did not vary much over sample family ages, while insurance needs did.

MetLife (2009) surveyed 1,000 US widows and widowers and found that 3/4 of those whose deceased spouses had had life cover had struggled due to its inadequacy, with most making substantial changes to their living standards, including relocating their residences. Sixty-three percent of respondents agreed that the impact of the death of a spouse had a bigger financial impact than they had imagined when the life cover was arranged. The survey found a substantial gap between the level of cover non-impacted customers considered adequate and what widows/widowers considered adequate.

LIMRA (2010), using national US data argue that ownership of life policies had fallen steadily since their 1998 and 2004 surveys, with 30% of US households having no life cover in 2010, and 50% of the rest feeling they need more cover. Nearly 70% of households would have trouble surviving financially more than several months without the main earner. LIMRA argue the main reason for this declining cover was the increasing scarcity of insurance agents, with 80% of respondents saying they felt a strong need for advice but had never received any. Only those under age 30 felt happy to research products and prices online. Another reason was an increasing number felt liquidity constrained and thus fewer took out any cover on top of the minimum level associated with their workplace scheme.

Genworth (2011) found that 42% of the 26,000 middle-American households they surveyed did not have life cover, and those who did held an average of $155,000, or 3.6 years coverage. Of married households 40%

were uninsured, as were 69% of single parents and 66% of wealthier single women. Those with adequate cover were nearly exclusively those who had insurance advisers who reviewed their cover once a year. The underinsurance rate was highest amongst single parents with children at home, despite the extreme vulnerability of their children. A commonly cited reason for underinsurance in this group was a reluctance to make their ex-spouse their beneficiary on behalf of the children. It is worth noting that single parents with children living with their ex-spouse had a higher rate of life cover ownership (59% vs. 69%).

LIMRA (2011) surveyed 3,766 US households and confirmed that the proportion of households with life cover has steadily dropped with only 53% of the 20-65 age group owning life cover, compared to 60% in 1990 and 67% in 1976. One of the issues is that the majority of cover was held with group employment–related schemes and increasing unemployment had meant loss of these policies. Another issue was that adults aged 35 to 54, the prime group for new policies, were purchasing lower rates of life cover than earlier cohorts had. An improvement was that younger women were more willing to purchase life cover, with equal ownership rates to men (though this was mainly due to the decline in male ownership). However, women owned lower amounts of life cover compared to their income than men did. Higher paid women with lower paid spouses, in particular, tended to purchase substantially lower cover to income than men in the same position.

THE EXTENT OF AUSTRALIAN UNDERINSURANCE

Most research in Australia has been survey based or uses limited modelling. Tooth and Baker (2007) examined non-insurance for general insurance in Australia and found 23% of households do not hold house or contents insurance. This non-insurance was positively associated with renters, low income, early stage of life, city-dwelling, non-western migrants and lower levels of education.

Sweeney Research/IFF-AIST (2008) surveyed 2,400 members of the Australian Institute of Superannuation Trustees and the Industry Funds Forum and found that the average life cover was $189,000 and the average TPD cover was $162,000, which Sweeney argued was low compared to their formula based suggested cover

of $483,000 to $550,000. More than half the members were underinsured for life by more than $100,000, while 71 per cent had TPD cover and 31 per cent had income protection cover, falling to 26 percent for those with dependent children. They found that only 31% held close to the recommended level of life cover, with 14% underinsured by up to $100,000, 12% underinsured by between $100,001 and $200,000, 11% underinsured by between $200,001 and $300,000 and 28% underinsured by at least $300,001. The levels of underinsurance were even higher for TPD, with 71% underinsured by $100,000 or more. They found that only 28% held close to the recommended level of income protection cover, with 22% underinsured by up to $1,000 per month, 15% underinsured by between $1001 and $2000, 13% underinsured by between $2001 and $3000 and 29% underinsured by over $3000. They concluded that Australia had substantial levels of underinsurance. The main issue with this study is that their formula for life/TPD is conceptually inadequate as used a simple multiple of 7 times net annual income plus debts, for income protection 84% of annual income and they offered no conceptual basis or justification for those recommended levels, other than it was provided by the IFF/AIST.

It needs to be noted that all members of superannuation schemes in Australia automatically receive set levels of life and TPD cover, with some providing income protection cover. Given that this set level is generally below recommended cover, the research question in Australia is therefore not the level of non-insurance, but the level of underinsurance; that is, do members privately take out the extra coverage they need, or do they assume that the automatic cover is adequate?

Comminsure (2004) surveyed 914 Australian respondents and found that 2/3 had some form of life insurance, and 80% of those regarded it as adequate. However, 60% of those insured only had their superannuation-linked cover and this averaged only 2 or 3 times annual salary (A$100–150,000). Of the 1/3 who had no life cover 62% were female and 38% male. Those aged 35-49 were more likely to have life cover than those aged 50-59 (69% vs. 59%). Of those who did not have cover outside superannuation 33% said they did not understand life insurance adequately, 49% regarded it as a waste of money, 39% did not like to think about death or serious injury and 40% would consider life cover if someone they knew died or suffered a disablement.

Rice Warner/TNS (2005) for the Investment and Financial Services Association (IFSA), interviewed 600 families with dependent children, and found that only 60% of workers are aware that their superannuation scheme includes life cover, and 15% don't know how much their superannuation offers. Those underinsured tend to be male, non-English speaking, aged 46-55 years and full-time workers. Those with no life cover tended to be female, aged under 30, income under $30,000, divorced single parents, live in rental property, or not working. This reflects those who are not in superannuation schemes. They noted that while 83% of Australians had car insurance, only 31% had income protection insurance.

Rice Warner Actuaries (2005) estimated that the young family demographic they assessed needed between 10 to 13 times annual income to maintain their standard of living if the main earner died. Only 4% of those surveyed had that level of cover. About 60% only had 1 year's income cover, 26% had between 1 and 5 years' cover, and 10% had between 5 and 10 years' cover. Unfortunately Rice Warner only had access to national level data and did not have access to actual insured needs. They thus assessed actual cover against a multiple of 10 to 13 times annual income for couples with two workers on average earnings with children in their mid-30s and a multiple of 6 to 9 times annual income for similar couples in their mid-40s. They also used data which included couples with no children and based calculations on income and not consumption. Their estimates can thus only be regarded as ball-park. For the particular scenario chosen – young couple, one earner, young children, one of pre-school age, insurance needs will be particularly high if the standard formula is used. It needs to be noted, however, that this group (i) is liquidity (cash) constrained as they will be setting up a household so will be price sensitive, (ii) may have made a rational choice to accept a lower post-tragedy life standard, relying more on social welfare, (iii) the at-home spouse may have the ability to return to work, and (iv) they have no immediate need to save for retirement or retain their house equity. They are in a more flexible position financially than a seemingly richer middle-aged couple who has higher expenses, and diminishing time to prepare for retirement.

AXA (2005) found that only 22% of those surveyed had any life cover and those who did, held on average $201,000 life cover versus the recommended $670,000.

Only 2% owned trauma cover, versus 12-15% in the U.K. AXA found that the major reason for underinsurance was the lack of knowledge of risks and products. The issue with this survey is that it includes groups who may have low needs for insurance cover, so is not comparable with other studies.

IFSA (2008) surveyed 13 life companies, representing 90% of the industry, and found that average payouts were $91,501 for term life, $70,678 for TPD, $154,927 for trauma and $2,827 per month for income protection. There was also a gender gap, with payments to women being 31% by number and 41% by value compared to men. They regarded these as well below required levels. Unfortunately they did not provide median figures or distribution statistics, so the usefulness of these means cannot be ascertained. Note that if male spouses earn higher income on average then life insurance payments to women (on their husbands) should be higher than for men, while payouts for TPD, trauma and income protection should be lower.

ING (2008) surveyed 1,000 Australians aged 25-65 with an income over A$50,000 matched by age, gender, state and urban/regional to the national population. They found that 72% of Australians have life cover, 25% trauma cover and 33% income protection. Life cover is highest amongst those with families and lowest amongst those without. Life non-insurance does not vary with the number of children. White collar workers were far more likely to hold life cover than blue collar.

Rice Warner (2010), for the IFSA, surveyed 1,000 Australian families with children and found that underinsurance had decreased in their 2005 survey, based on total levels of cover and using the same methodology as their 2005 survey. While increases in the minimum rates of life cover within superannuation schemes meant that 83% of Australians had their life cover needs met, only 22% had adequate TPD cover and 24% adequate IP cover. The Australian Bureau of Statistics (2011) found that 47% of Australians did not have health insurance, with 58% of those citing cost as the major reason.

The most comprehensive study was LifeBroker (2010) which surveyed 1,000 Australians and found a high level of confusion about personal insurance products. They sampled on a representative basis by state, age and gender. They found 71% of respondents mistakenly believed the Federal Government is required to provide support to families if the main earner died, 70% mistakenly believed the Federal Government is required to provide a replacement income if a worker has to stop work due to illness or injury, 82% mistakenly believed income protection policies pay out a lump sum if a worker loses their job, 85% mistakenly believe life policies pay out if you live past retirement age, and 67% believe insurance companies use loopholes to avoid payouts. They found that 65% of female and 49% of male respondents vastly overestimated the premiums for life cover. They found that 21% had income protection policies and 49% have life cover, with half of life policies set at the low default superannuation rate. In contrast 56% had private health insurance, 80% had house insurance and 86% had car insurance. Uptake of life cover is higher for those aged 40-54, couples and those with incomes over A$125,000. Ninety-two percent of respondents disagreed with the proposition that they were knowingly choosing to take the risk of not having insurance, with a number of respondents agreeing that they would actively seek more personal insurance. Forty-six percent agreed they would not cope well without income insurance, as did 47% for life cover. Only 45% regarded themselves as having a good knowledge of income protection insurance, 54% of life, 69% of private health insurance, 77% of house insurance and 79% of car insurance. Levels of knowledge were lowest amongst those who were younger, those with large mortgages and those with lower incomes. Only 42% knew life cover pays out a lump sum on death, only 38% knew income protection insurance pays out a replacement income if you stop work due to injury or sickness, and only 22% knew that a medical examination is neither compulsory nor normal when applying for life cover. As many worried about the financial impact of crashing their car as they did about dying, or stopping work due to illness (19%, 23%, 23%). Lifebroker argue that the low rate of personal insurance uptake in Australia is not due to risk taking, "she'll be right" attitudes, as prior research suggested, but due to customer ignorance of products and mis-assessment of risk.

APPENDIX FIVE: TABLES

Table A - 5: Insurance Density

OECD - Insurance Density (ratio of total insurance premiums (in US$) to total population)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Country										
Australia	1696.165	1510.03	1570.705	1767.215	2107.624	2181.093	2236.613	2876.442	2741.595	2372.201
Austria	1313.576	1356.414	1456.406	1807.766	2061.413	2107.499	2162.351	2371.548	2825.988	..
Belgium	1742.009	1750.69	2000.951	2735.646	3356.004	4011.137	3451.101	4003.373	..	..
Canada	1609.953	1605.87	1702.684	2073.084	2397.099	2687.26	3002.365	3399.226	3063.108	2902.169
Czech Rep	177.718	206.696	270.154	366.662	426.447	475.493	525.005	631.268	780.355	713.815
Denmark	1891.75	2041.247	2513.807	2747.203	3173.628	3839.838	4279.44	5182.814	5897.533	..
Finland	1163.338	1002.485	1071.637	1189.55	1361.18	1471.007	1450.958	1532.102	1670.03	1739.009
France	2029.97	1910.186	2065.355	2634.712	3246.084	3585.841	4585.647	4764.878	4266.326	4408.125
Germany	1522.862	1499.454	1675.45	2090.246	2389.821	2467.638	2453.05	2706.716	2912.189	..
Greece	213.76	214.375	247.68	331.212	406.594	432.783	530.443	626.883	678.173	..
Hungary	130.656	143.967	190.066	246.127	292.492	341.211	384.578	502.156	508.616	405.623
Iceland	841.276	813.571	930.771	1242.475	1326.168	..	1540.92	1848.908	1434.64	860.128
Ireland	5274.003	3809.555	..	6106.368	8126.947	9284.474	10699.641	14344.887	11737.694	10344.698
Italy	1103.6	1204.161	1460.061	1920.96	2236.524	2429.884	2396.191	2410.563	2350.65	2733.035
Japan	2655.279	2285.55	2180.964	2373.728	2517.068	2578.679	2414.341	2586.617	3170.651	..
Korea	1284.227	1081.217	1169.878	1250.579	1387.697	1747.097	2089.21	2369.816	2076.121	1889.643
Luxembourg	13094.44	12336.192	12904.4	16602.747	22129.707	27854.855	31899.622	32195.808	32750.933	46688.448
Mexico	111.248	112.548	127.296	106.311	117.661	118.726	143.091	164.625	173.344	160.357
Netherlands	2300.957	2418.827	2540.084	3166.899	3712.437	3695.816	3501.807	3943.508	4284.73	..
New Zealand	345.904	320.812	..	433.013	636.794	735.506	690.546	768.727	719.596	668.968
Norway	1662.762	1828.158	2251.999	2771.053	3286.309	3705.501	3471.698	4197.377	5059.108	4396.474
Poland	123.756	141.358	143.637	165.164	195.022	247.443	313.441	410.099	640.177	427.281
Portugal	698.621	668.719	752.914	998.604	1209.097	1564.807	1509.396	1724.062	2061.303	1802.413
Slovak Rep	109.849	123.281	150.291	..	277.747	..	335.297	430.609	551.422	..
Spain	932.473	914.411	1097.463	1123.221	1330.343	1407.294	1514.029	1662.958	1901.405	1818.12
Sweden	2278.625	2110.618	..	2638.871	3146.106	3289.162	3197.817	3182.393	3168.153	2513.644
Switzerland	4173.246	4656.859	5127.419	5434.394	5711.638	5586.392	5260.751	5558.747	6985.726	6375.619
Turkey	45.956	32.561	34.831	47.148	65.258	73.103	76.913	119.128	..	..
UK	4107.75	3666.56	3955.047	4661.394	5254.927	5577.523	5913.22	8808.211	6398.225	..
USA	3744.105	3733.355	3381.191	4270.969	4443.943	4408.579	4706.027	4911.886	4935.844	..
EU	1923.033	1829.127	1931.751	2490.555	2914.851	3131.066	3353.317	4008.852	..	..
NAFTA	2714.061	2704.322	2471.877	3101.36	3244.36	3227.316	3483.508	3658.224	3651.161	..
OECD - Tot	2057.104	1974.005	1921.649	2375.329	2605.581	2697.097	2875.562	3219.536	..	..

data extracted on 22 Sep 2011 from OECD.Stat

Table A - 6: Life Insurance Density

OECD - Life Insurance Density (ratio of total insurance premiums (in US$) to total population)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Country										
Australia	1197.195	1049.654	1014.382	1048.148	1286.369	1321.941	1369.311	1898.944	1728.732	1376.328
Austria	604.435	633.52	648.614	760.238	916.092	972.966	969.33	1022.358	1273.103	..
Belgium	1152.788	1152.158	1323.108	1898.993	2391.569	3029.767	2437.766	2860.087	..	..
Canada	785.098	710.53	690.197	792.213	953.196	1100.477	1233.677	1455.331	1069.689	1010.72
Czech Rep	57.374	72.765	101.934	143.32	168.536	183.589	204.007	258.439	319.448	300.914
Denmark	1212.425	1352.608	1552.26	1666.756	1899.767	2525.757	2880.255	3413.472	3995.685	..
Finland	748.222	570.857	598.579	615.574	683.579	740.128	700.044	719.903	772.575	870.381
France	1406.933	1272.169	1347.217	1719.138	2173.737	2474.783	2975.732	3086.227	2870.071	719.564
Germany	704.242	696.113	765.84	961.57	1097.499	1174.924	1128.128	1240.644	1339.772	..
Greece	110.852	106.426	114.003	147.998	194.962	214.256	257.692	308.422	324.759	..
Hungary	59.975	60.367	78.303	98.885	119.173	150.424	194.746	276.707	268.44	205.219
Iceland	63.777	66.915	86.421	142.605	170.239	..	142.308	154.381	108.704	82.894
Ireland	4048.249	2596.411	..	4046.909	5895.445	7087.479	8521.479	11988.117	9337.739	8390.202
Italy	645.742	725.053	913.17	1235.001	1443.259	1623.152	1569.898	1496.845	1382.896	1884.773
Japan	1965.312	1689.006	1596.965	1753.544	1951.932	2013.293	1867.695	2054.328	2580.241	..
Korea	975.221	775.116	823.706	884.292	976.158	1242.527	1445.613	1638.214	1390.363	1213.95
Luxembourg	11404.154	10550.477	10963.947	14890.412	20054.261	25308.356	29135.937	28779.924	29446.213	43533.631
Mexico	61.471	52.86	59.096	41.181	50.144	48.802	64.553	72.339	77.899	71.214
Netherlands	1317.294	1415.406	1390.004	1689.687	1924.203	1882.304	1969.69	2227.845	2365.856	..
New Zealand	75.835	71.195	..	33.198	..	..	..	..	..	..
Norway	736.699	895.69	1083.738	1360.668	1748.33	2046.843	1827.648	2564.627	2975.21	2477.779
Poland	42.066	49.148	50.236	61.636	74.13	123.183	177.748	241.416	423.87	253.894
Portugal	389.23	370.699	408.439	568.272	721.178	1072.825	1018.806	1189.173	1502.332	1310.99
Slovak Rep	44.897	52.988	64.65	..	111.86	..	158.568	213.786	289.225	..
Spain	544.377	501.299	605.807	487.743	572.414	606.998	669.914	712.361	881.457	881.741
Sweden	1374.201	1300.725	..	1533.718	1807.131	1993.054	1882.769	1679.834	1586.559	1386.674
Switzerland	2595.301	2720.52	3056.011	3261.042	3292.504	3289.55	2993.638	3205.853	3864.213	3499.675
Turkey	7.797	5.518	6.552	9.785	12.063	10.739	9.204	14.503	..	..
UK	3124.375	2556.38	2657.529	2894.654	3413.988	3817.54	4184.245	6911.012	4609.735	..
USA	1834.844	1578.851	1659.735	1751.045	1840.138	1876.769	2003.761	2355.409	2429.896	..
EU	1246.722	1128.911	1162.846	1456.501	1747.069	1962.247	2101.424	2634.853	..	..
NAFTA	1331.436	1147.275	1201.704	1266.639	1340.83	1370.245	1480.763	1739.569	1762.773	..
OECD - Tot	1206.378	1059.522	1084.874	1229.688	1385.57	1487.231	1573.721	1895.027	..	..

data extracted on 22 Sep 2011 from OECD.Stat

Table A - 7: Insurance Penetration

OECD - Insurance Penetration (ratio of total insurance premiums (in US$) to total population)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Country										
Australia	8.13	7.704	7.264	6.444	6.422	6.011	5.849	6.381	5.608	..
Austria	5.496	5.71	5.665	5.747	5.755	5.692	5.535	5.32	5.681	5.96
Belgium	7.7	7.774	8.208	9.159	9.709	11.257	9.165	9.277	8.296	8.247
Canada	6.816	6.963	7.271	7.581	7.725	7.662	7.682	7.84	6.81	7.329
Czech Rep	3.219	3.417	3.661	4.095	4.022	3.92	3.763	3.746	3.767	3.941
Denmark	6.31	6.816	7.769	6.96	7.037	8.036	8.425	9.122	9.499	..
Finland	4.941	4.155	4.113	3.765	3.762	3.948	3.647	3.295	3.28	3.901
France	9.021	8.468	8.471	8.805	9.537	10.265	12.408	11.354	9.312	10.421
Germany	6.584	6.524	6.849	7.069	7.193	7.302	6.936	6.714	6.581	..
Greece	2.012	1.971	2.015	2.08	2.158	2.137	2.203	2.247	2.175	..
Hungary	2.782	2.751	2.894	2.953	2.894	3.119	3.43	3.648	3.311	3.152
Iceland	2.738	2.956	3.049	3.319	2.976	..	2.819	2.883	2.727	2.263
Ireland	20.751	14.027	..	15.494	17.936	19.135	20.675	23.859	19.521	20.319
Italy	5.752	6.18	6.884	7.326	7.455	7.982	7.542	6.712	6.073	7.729
Japan	7.221	7.104	7.093	7.163	6.978	7.242	7.049	7.545	8.285	..
Korea	11.799	10.625	10.185	9.84	9.805	10.713	11.363	11.841	10.835	11.065
Luxembourg	28.186	26.964	25.406	25.852	29.926	34.669	34.516	30.878	27.49	44.058
Mexico	1.89	1.811	1.99	1.709	1.791	1.655	1.788	1.709	1.702	..
Netherlands	9.516	9.687	9.369	9.545	9.904	9.58	8.54	8.324	8.068	7.855
New Zealand	2.533	2.376	..	2.152	2.628	2.747	2.666	2.492	2.365	..
Norway	4.437	4.828	5.325	5.618	5.836	5.681	4.81	5.088	5.349	5.561
Poland	2.763	2.841	2.773	2.913	2.95	3.115	3.498	3.682	4.619	3.791
Portugal	6.344	5.955	6.131	6.672	7.093	8.919	8.203	8.189	8.694	8.234
Slovak Rep	2.901	3.142	3.297	..	3.558	..	3.281	3.098	3.148	3.262
Spain	6.466	6.113	6.607	5.342	5.445	5.424	5.422	5.19	5.437	5.719
Sweden	8.354	8.475	..	7.772	8.107	8.311	7.389	6.422	5.991	5.756
Switzerland	12.185	13.443	13.522	12.353	11.736	11.073	10.154	9.837	10.633	10.035
Turkey	1.555	1.529	1.311	1.381	1.537	1.453	1.391	1.279	..	..
UK	16.772	15.102	14.926	15.313	14.597	14.93	14.933	19.158	14.543	..
USA	10.82	10.564	9.347	11.388	11.195	10.54	10.729	10.781	10.497	11.364
EU	9.02	8.559	8.336	8.851	9.038	9.427	9.529	9.957	8.434	5.062
NAFTA	10.089	9.861	8.813	10.624	10.455	9.835	9.982	9.95	9.604	..
OECD - Tot	9.051	8.832	8.275	9.175	9.111	9.036	9.167	9.342	8.619	..

data extracted on 22 Sep 2011 from OECD.Stat

Table A - 8: New Zealand Life Table - Males

Total Male Population Period Life Table, 2005-07

| Exact age (years) | Out of 100,000 males born | | | Probability that a male who reaches this age | | Expected number of years of life remaining at age x | Exact age (years) | Out of 100,000 males born | | | Probability that a male who reaches this age | | Expected number of years of life remaining at age x |
| | Number alive at exact age | Average number alive at the age interval | Number dying in the age interval | Lives another year | Dies within a year | | | Number alive at exact age | Average number alive at the age interval | Number dying in the age interval | Lives another year | Dies within a year | |
x	l_x	L_x	d_x	p_x	q_x	e_x	x	l_x	L_x	d_x	p_x	q_x	e_x
0	100,000	99,536	563	0.99437	0.00563	78.04	55	92,838	92,606	465	0.99499	0.00501	26.25
1	99,437	99,412	50	0.99950	0.00050	77.48	56	92,373	92,120	507	0.99451	0.00549	25.38
2	99,387	99,373	28	0.99972	0.00028	76.52	57	91,866	91,590	553	0.99398	0.00602	24.52
3	99,359	99,347	25	0.99975	0.00025	75.54	58	91,313	91,012	603	0.99340	0.00660	23.67
4	99,334	99,323	22	0.99978	0.00022	74.56	59	90,710	90,381	658	0.99275	0.00725	22.82
5	99,312	99,303	19	0.99981	0.00019	73.57	60	90,052	89,693	718	0.99203	0.00797	21.98
6	99,293	99,285	16	0.99984	0.00016	72.59	61	89,334	88,943	783	0.99123	0.00877	21.16
7	99,277	99,271	13	0.99987	0.00013	71.60	62	88,551	88,124	855	0.99035	0.00965	20.34
8	99,264	99,258	12	0.99988	0.00012	70.61	63	87,696	87,230	932	0.98937	0.01063	19.53
9	99,252	99,247	11	0.99989	0.00011	69.62	64	86,764	86,256	1,017	0.98828	0.01172	18.74
10	99,241	99,236	11	0.99989	0.00011	68.62	65	85,747	85,194	1,107	0.98709	0.01291	17.95
11	99,230	99,224	13	0.99987	0.00013	67.63	66	84,640	84,038	1,205	0.98576	0.01424	17.18
12	99,217	99,208	18	0.99982	0.00018	66.64	67	83,435	82,781	1,309	0.98431	0.01569	16.42
13	99,199	99,187	25	0.99975	0.00025	65.65	68	82,126	81,415	1,422	0.98268	0.01732	15.67
14	99,174	99,157	35	0.99965	0.00035	64.67	69	80,704	79,932	1,545	0.98086	0.01914	14.94
15	99,139	99,116	47	0.99953	0.00047	63.69	70	79,159	78,321	1,677	0.97881	0.02119	14.22
16	99,092	99,063	59	0.99940	0.00060	62.72	71	77,482	76,571	1,822	0.97649	0.02351	13.52
17	99,033	98,997	73	0.99926	0.00074	61.76	72	75,660	74,672	1,976	0.97388	0.02612	12.83
18	98,960	98,918	85	0.99914	0.00086	60.80	73	73,684	72,614	2,141	0.97095	0.02905	12.17
19	98,875	98,828	95	0.99904	0.00096	59.85	74	71,543	70,387	2,312	0.96768	0.03232	11.51
20	98,780	98,729	102	0.99897	0.00103	58.91	75	69,231	67,988	2,487	0.96407	0.03593	10.88
21	98,678	98,625	106	0.99893	0.00107	57.97	76	66,744	65,413	2,663	0.96010	0.03990	10.27
22	98,572	98,519	107	0.99891	0.00109	57.03	77	64,081	62,664	2,834	0.95577	0.04423	9.68
23	98,465	98,412	107	0.99891	0.00109	56.10	78	61,247	59,749	2,997	0.95107	0.04893	9.10
24	98,358	98,306	105	0.99893	0.00107	55.16	79	58,250	56,676	3,148	0.94596	0.05404	8.54
25	98,253	98,202	102	0.99896	0.00104	54.21	80	55,102	53,456	3,293	0.94023	0.05977	8.00
26	98,151	98,102	99	0.99899	0.00101	53.27	81	51,809	50,091	3,437	0.93366	0.06634	7.48
27	98,052	98,004	96	0.99902	0.00098	52.32	82	48,372	46,583	3,579	0.92601	0.07399	6.97
28	97,956	97,910	93	0.99905	0.00095	51.37	83	44,793	42,936	3,714	0.91708	0.08292	6.49
29	97,863	97,818	91	0.99907	0.00093	50.42	84	41,079	39,162	3,834	0.90666	0.09334	6.03
30	97,772	97,727	90	0.99908	0.00092	49.47	85	37,245	35,284	3,923	0.89467	0.10533	5.60
31	97,682	97,637	91	0.99907	0.00093	48.51	86	33,322	31,346	3,953	0.88137	0.11863	5.20
32	97,591	97,544	94	0.99904	0.00096	47.56	87	29,369	27,418	3,902	0.86714	0.13286	4.84
33	97,497	97,449	97	0.99900	0.00100	46.60	88	25,467	23,587	3,761	0.85231	0.14769	4.50
34	97,400	97,349	103	0.99894	0.00106	45.65	89	21,706	19,939	3,534	0.83720	0.16280	4.19
35	97,297	97,243	109	0.99888	0.00112	44.70	90	18,172	16,556	3,232	0.82213	0.17787	3.91
36	97,188	97,130	117	0.99880	0.00120	43.75	91	14,940	13,501	2,878	0.80733	0.19267	3.65
37	97,071	97,009	124	0.99872	0.00128	42.80	92	12,062	10,799	2,527	0.79054	0.20946	3.40
38	96,947	96,881	133	0.99863	0.00137	41.85	93	9,535	8,453	2,165	0.77290	0.22710	3.17
39	96,814	96,744	141	0.99854	0.00146	40.91	94	7,370	6,466	1,809	0.75459	0.24541	2.96
40	96,673	96,598	151	0.99844	0.00156	39.97	95	5,561	4,825	1,473	0.73517	0.26483	2.76
41	96,522	96,443	159	0.99835	0.00165	39.03	96	4,088	3,505	1,166	0.71473	0.28527	2.57
42	96,363	96,278	170	0.99824	0.00176	38.09	97	2,922	2,474	896	0.69333	0.30667	2.40
43	96,193	96,104	179	0.99814	0.00186	37.16	98	2,026	1,693	666	0.67110	0.32890	2.24
44	96,014	95,919	191	0.99801	0.00199	36.23	99	1,360	1,121	479	0.64815	0.35185	2.09
45	95,823	95,722	203	0.99788	0.00212	35.30	100	881	716	331	0.62463	0.37537	1.95
46	95,620	95,511	218	0.99772	0.00228	34.37							
47	95,402	95,285	235	0.99754	0.00246	33.45							
48	95,167	95,041	253	0.99734	0.00266	32.53							
49	94,914	94,777	275	0.99710	0.00290	31.62							
50	94,639	94,489	300	0.99683	0.00317	30.71							
51	94,339	94,176	327	0.99653	0.00347	29.81							
52	94,012	93,834	357	0.99620	0.00380	28.91							
53	93,655	93,460	391	0.99583	0.00417	28.02							
54	93,264	93,051	426	0.99543	0.00457	27.13							

Table A - 9: New Zealand Life Table - Females

Total Female Population Period Life Table, 2005-07

Exact age (years)	Out of 100,000 females born			Probability that a female who reaches this age		Expected number of years of life remaining at age x	Exact age (years)	Out of 100,000 females born			Probability that a female who reaches this age		Expected number of years of life remaining at age x
	Number alive at exact age	Average number alive at the age interval	Number dying in the age interval	Lives another year	Dies within a year			Number alive at exact age	Average number alive at the age interval	Number dying in the age interval	Lives another year	Dies within a year	
x	l_x	L_x	d_x	p_x	q_x	e_x	x	l_x	L_x	d_x	p_x	q_x	e_x
0	100,000	99,623	448	0.99552	0.00448	82.16	55	95,429	95,266	326	0.99658	0.00342	29.32
1	99,552	99,528	49	0.99951	0.00049	81.53	56	95,103	94,925	357	0.99625	0.00375	28.42
2	99,503	99,491	25	0.99975	0.00025	80.57	57	94,746	94,552	388	0.99590	0.00410	27.53
3	99,478	99,467	22	0.99978	0.00022	79.59	58	94,358	94,146	424	0.99551	0.00449	26.64
4	99,456	99,447	19	0.99981	0.00019	78.60	59	93,934	93,703	462	0.99508	0.00492	25.76
5	99,437	99,429	16	0.99984	0.00016	77.62	60	93,472	93,220	504	0.99461	0.00539	24.88
6	99,421	99,415	13	0.99987	0.00013	76.63	61	92,968	92,694	549	0.99410	0.00590	24.02
7	99,408	99,403	11	0.99989	0.00011	75.64	62	92,419	92,120	598	0.99353	0.00647	23.15
8	99,397	99,393	9	0.99991	0.00009	74.65	63	91,821	91,496	650	0.99292	0.00708	22.30
9	99,388	99,384	8	0.99992	0.00008	73.66	64	91,171	90,818	707	0.99224	0.00776	21.46
10	99,380	99,376	9	0.99991	0.00009	72.66	65	90,464	90,079	770	0.99149	0.00851	20.62
11	99,371	99,366	10	0.99990	0.00010	71.67	66	89,694	89,275	839	0.99065	0.00935	19.79
12	99,361	99,355	13	0.99987	0.00013	70.68	67	88,855	88,397	916	0.98969	0.01031	18.98
13	99,348	99,340	17	0.99983	0.00017	69.69	68	87,939	87,439	1,001	0.98862	0.01138	18.17
14	99,331	99,320	22	0.99978	0.00022	68.70	69	86,938	86,391	1,095	0.98740	0.01260	17.37
15	99,309	99,295	28	0.99972	0.00028	67.71	70	85,843	85,244	1,198	0.98604	0.01396	16.59
16	99,281	99,264	35	0.99965	0.00035	66.73	71	84,645	83,991	1,309	0.98453	0.01547	15.82
17	99,246	99,226	40	0.99960	0.00040	65.75	72	83,336	82,622	1,428	0.98287	0.01713	15.06
18	99,206	99,185	43	0.99957	0.00043	64.78	73	81,908	81,132	1,552	0.98105	0.01895	14.31
19	99,163	99,141	44	0.99956	0.00044	63.81	74	80,356	79,515	1,683	0.97906	0.02094	13.58
20	99,119	99,098	43	0.99957	0.00043	62.84	75	78,673	77,762	1,823	0.97683	0.02317	12.86
21	99,076	99,056	41	0.99959	0.00041	61.86	76	76,850	75,862	1,976	0.97429	0.02571	12.15
22	99,035	99,016	38	0.99962	0.00038	60.89	77	74,874	73,802	2,145	0.97135	0.02865	11.46
23	98,997	98,980	35	0.99965	0.00035	59.91	78	72,729	71,563	2,332	0.96794	0.03206	10.78
24	98,962	98,946	33	0.99967	0.00033	58.93	79	70,397	69,129	2,536	0.96398	0.03602	10.12
25	98,929	98,914	30	0.99970	0.00030	57.95	80	67,861	66,483	2,757	0.95938	0.04062	9.48
26	98,899	98,885	29	0.99971	0.00029	56.97	81	65,104	63,609	2,991	0.95406	0.04594	8.86
27	98,870	98,855	30	0.99970	0.00030	55.99	82	62,113	60,496	3,235	0.94792	0.05208	8.26
28	98,840	98,824	33	0.99967	0.00033	55.00	83	58,878	57,138	3,480	0.94089	0.05911	7.69
29	98,807	98,789	37	0.99963	0.00037	54.02	84	55,398	53,539	3,718	0.93288	0.06712	7.14
30	98,770	98,750	41	0.99958	0.00042	53.04	85	51,680	49,710	3,941	0.92375	0.07625	6.62
31	98,729	98,706	47	0.99952	0.00048	52.06	86	47,739	45,671	4,136	0.91337	0.08663	6.12
32	98,682	98,656	53	0.99946	0.00054	51.09	87	43,603	41,458	4,290	0.90161	0.09839	5.66
33	98,629	98,600	58	0.99941	0.00059	50.12	88	39,313	37,119	4,389	0.88837	0.11163	5.22
34	98,571	98,540	62	0.99937	0.00063	49.15	89	34,924	32,717	4,415	0.87358	0.12642	4.81
35	98,509	98,476	66	0.99933	0.00067	48.18	90	30,509	28,334	4,351	0.85740	0.14260	4.44
36	98,443	98,408	70	0.99929	0.00071	47.21	91	26,158	24,066	4,185	0.84001	0.15999	4.09
37	98,373	98,336	74	0.99925	0.00075	46.24	92	21,973	20,013	3,920	0.82159	0.17841	3.78
38	98,299	98,259	80	0.99919	0.00081	45.28	93	18,053	16,269	3,569	0.80233	0.19767	3.49
39	98,219	98,176	86	0.99912	0.00088	44.31	94	14,484	12,908	3,152	0.78238	0.21762	3.22
40	98,133	98,086	95	0.99903	0.00097	43.35	95	11,332	9,980	2,704	0.76134	0.23866	2.98
41	98,038	97,986	105	0.99893	0.00107	42.39	96	8,628	7,503	2,250	0.73926	0.26074	2.76
42	97,933	97,876	115	0.99883	0.00117	41.44	97	6,378	5,473	1,810	0.71624	0.28376	2.55
43	97,818	97,756	125	0.99872	0.00128	40.48	98	4,568	3,866	1,405	0.69238	0.30762	2.37
44	97,693	97,625	136	0.99861	0.00139	39.54	99	3,163	2,638	1,051	0.66780	0.33220	2.20
45	97,557	97,484	146	0.99850	0.00150	38.59	100	2,112	1,735	755	0.64265	0.35735	2.05
46	97,411	97,333	157	0.99839	0.00161	37.65							
47	97,254	97,170	169	0.99826	0.00174	36.71							
48	97,085	96,994	183	0.99812	0.00188	35.77							
49	96,902	96,803	198	0.99796	0.00204	34.84							
50	96,704	96,597	214	0.99779	0.00221	33.91							
51	96,490	96,374	233	0.99759	0.00241	32.98							
52	96,257	96,131	252	0.99738	0.00262	32.06							
53	96,005	95,867	276	0.99713	0.00287	31.14							
54	95,729	95,579	300	0.99687	0.00313	30.23							

Table A - 10: NZ Mortality and Survivorship Rates

Table A2.1

Mortality and Survivorship Rates

By five-year age group and sex

Total, Māori and Non-Māori populations, 2005–07 period life table

Exact age (years)	Total population				Māori population				Non Māori population			
	Probability that a person who reaches this age:		Central annual death rate for age group x to x+5	Proportion of age group x to x+5 who will survive another five years	Probability that a person who reaches this age:		Central annual death rate for age group x to x+5	Proportion of age group x to x+5 who will survive another five years	Probability that a person who reaches this age:		Central annual death rate for age group x to x+5	Proportion of age group x to x+5 who will survive another five years
	Lives another five years	Dies within five years			Lives another five years	Dies within five years			Lives another five years	Dies within five years		
x	$_5p_x$	$_5q_x$	$_5m_x$	$_5s_x$	$_5p_x$	$_5q_x$	$_5m_x$	$_5s_x$	$_5p_x$	$_5q_x$	$_5m_x$	$_5s_x$
Male												
0	0.99312	0.00688	0.00138	0.99874	0.99034	0.00966	0.00195	0.99789	0.99418	0.00582	0.00117	0.99904
5	0.99929	0.00071	0.00014	0.99929	0.99892	0.00108	0.00022	0.99905	0.99946	0.00054	0.00011	0.99940
10	0.99897	0.00103	0.00021	0.99780	0.99869	0.00131	0.00026	0.99681	0.99908	0.00092	0.00018	0.99800
15	0.99638	0.00362	0.00073	0.99529	0.99424	0.00576	0.00115	0.99239	0.99667	0.00333	0.00067	0.99574
20	0.99466	0.00534	0.00107	0.99481	0.99161	0.00839	0.00168	0.99197	0.99535	0.00465	0.00093	0.99569
25	0.99510	0.00490	0.00098	0.99525	0.99213	0.00787	0.00158	0.99121	0.99602	0.00398	0.00080	0.99601
30	0.99514	0.00486	0.00097	0.99446	0.98978	0.01022	0.00205	0.98768	0.99583	0.00417	0.00084	0.99538
35	0.99359	0.00641	0.00129	0.99244	0.98545	0.01455	0.00293	0.98291	0.99483	0.00517	0.00104	0.99400
40	0.99121	0.00879	0.00177	0.98960	0.98005	0.01995	0.00403	0.97607	0.99298	0.00702	0.00141	0.99146
45	0.98764	0.01236	0.00249	0.98462	0.97123	0.02877	0.00583	0.96396	0.98963	0.01037	0.00208	0.98697
50	0.98097	0.01903	0.00384	0.97590	0.95505	0.04495	0.00918	0.94241	0.98379	0.01621	0.00327	0.97929
55	0.96999	0.03001	0.00609	0.96185	0.92761	0.07239	0.01499	0.90930	0.97402	0.02598	0.00526	0.96657
60	0.95219	0.04781	0.00978	0.93893	0.88874	0.11126	0.02349	0.86529	0.95760	0.04240	0.00865	0.94483
65	0.92317	0.07683	0.01594	0.90131	0.83884	0.16116	0.03495	0.80913	0.92952	0.07048	0.01457	0.90791
70	0.87458	0.12542	0.02665	0.83875	0.77457	0.22543	0.05069	0.73280	0.88146	0.11854	0.02509	0.84523
75	0.79592	0.20408	0.04521	0.74315	0.67892	0.32108	0.07632	0.61367	0.80126	0.19874	0.04387	0.74618
80	0.67593	0.32407	0.07689	0.59241	0.53329	0.46671	0.12272	0.46358	0.67753	0.32247	0.07644	0.59484
85	0.48790	0.51210	0.13864	0.40541	0.37483	0.62517	0.18911	0.31240	0.49131	0.50869	0.13734	0.40887
90	0.30602	0.69398	0.22611	0.24415	0.23037	0.76963	0.27934	0.18454	0.30968	0.69032	0.22397	0.24752
Female												
0	0.99437	0.00563	0.00113	0.99893	0.99176	0.00824	0.00166	0.99827	0.99548	0.00452	0.00091	0.99919
5	0.99943	0.00057	0.00011	0.99946	0.99909	0.00091	0.00018	0.99913	0.99948	0.00052	0.00010	0.99954
10	0.99929	0.00071	0.00014	0.99870	0.99871	0.00129	0.00026	0.99763	0.99948	0.00052	0.00010	0.99906
15	0.99809	0.00191	0.00038	0.99795	0.99684	0.00316	0.00063	0.99692	0.99856	0.00144	0.00029	0.99827
20	0.99808	0.00192	0.00038	0.99833	0.99708	0.00292	0.00058	0.99694	0.99822	0.00178	0.00036	0.99847
25	0.99839	0.00161	0.00032	0.99795	0.99654	0.00346	0.00069	0.99560	0.99867	0.00133	0.00027	0.99848
30	0.99736	0.00264	0.00053	0.99677	0.99448	0.00552	0.00111	0.99324	0.99812	0.00188	0.00038	0.99747
35	0.99618	0.00382	0.00076	0.99526	0.99200	0.00800	0.00161	0.99053	0.99671	0.00329	0.00066	0.99580
40	0.99413	0.00587	0.00118	0.99276	0.98878	0.01122	0.00226	0.98604	0.99486	0.00514	0.00103	0.99374
45	0.99126	0.00874	0.00176	0.98922	0.98259	0.01741	0.00351	0.97721	0.99247	0.00753	0.00151	0.99071
50	0.98682	0.01318	0.00265	0.98344	0.97066	0.02934	0.00595	0.96140	0.98864	0.01136	0.00228	0.98578
55	0.97949	0.02051	0.00414	0.97409	0.95053	0.04947	0.01013	0.93629	0.98244	0.01756	0.00354	0.97776
60	0.96782	0.03218	0.00653	0.95923	0.91998	0.08002	0.01663	0.90024	0.97216	0.02784	0.00564	0.96420
65	0.94892	0.05108	0.01046	0.93415	0.87811	0.12189	0.02588	0.85351	0.95469	0.04531	0.00926	0.94075
70	0.91648	0.08352	0.01738	0.89240	0.82619	0.17381	0.03797	0.79494	0.92339	0.07661	0.01588	0.89773
75	0.86257	0.13743	0.02937	0.81839	0.75615	0.24385	0.05537	0.70486	0.86609	0.13391	0.02856	0.82175
80	0.76156	0.23844	0.05371	0.68602	0.63927	0.36073	0.08787	0.57177	0.76615	0.23385	0.05256	0.69122
85	0.59034	0.40966	0.10244	0.49154	0.48657	0.51343	0.13983	0.40627	0.59410	0.40590	0.10111	0.49381
90	0.37143	0.62857	0.18877	0.28998	0.30190	0.69810	0.22770	0.23651	0.37367	0.62633	0.18771	0.29227

Table A - 11: Mortality figures on expected vs actual deaths on insured lives

Type	Sex	Expected Deaths					Actual Deaths					Ratio Actual: Expected				
		0	1	2	3	Ult	0	1	2	3	Ult	0	1	2	3	Ult
TERM	M	451	465	471	468	3,589	178	229	204	228	1,865	39%	49%	43%	49%	52%
	F	217	227	234	234	1,511	70	88	106	112	981	32%	39%	45%	48%	65%

Type	Sex	Expected Deaths					Actual Deaths					Ratio Actual: Expected				
		0	1	2	3	Ult	0	1	2	3	Ult	0	1	2	3	Ult
Males	-$100k	131	141	157	166	1,908	69	87	96	103	1,005	53%	62%	61%	62%	53%
	$100-250k	154	164	167	166	1,131	57	84	61	84	632	37%	51%	37%	51%	56%
	$250-500k	111	108	100	93	402	37	36	38	31	165	33%	33%	38%	33%	41%
	$500k+	56	52	47	43	149	15	22	9	10	63	27%	42%	19%	23%	42%
Females	-$100k	76	83	94	99	779	26	52	50	58	545	34%	62%	53%	59%	70%
	$100-250k	77	82	84	85	547	27	27	42	37	354	35%	33%	50%	44%	65%
	$250-500k	49	47	44	40	154	15	8	12	14	70	31%	17%	27%	35%	45%
	$500k+	16	14	12	10	30	2	1	2	3	12	13%	7%	16%	29%	40%

Note: Expected is against NZLT 05-07
New Zealand Society of Actuaries (2009) Report into the Mortality of New Zealand Insured Lives 2005 - 2007

Table A - 12: Disability by Type

Statistics New Zealand

Adults with disability, by disability type, age-group, sex and place of residence, 2006

Adult age group	15 - 44			45 - 64			65 and over			Total adult age group		
Sex	Male	Female	Total sex	Male	Female	Total sex	Male	Female	Total sex	Male	Female	Total sex
Residence	Household	Household	Household	Household	Household	Household	Household	Household	Household	Household	Household	Household
Dis. type Adult												
Sensory	25000	18100	43100	52300	34300	86600	49900	40700	90600	127200	93200	220300
Physical	30600	36500	67100	57300	74000	131300	63400	91400	154700	151300	201800	353200
Intellectual	11000	7400	18400	5900	4400	10300	1100	1900	3000	18000	13700	31700
Psychiatric/ psychological	20700	24500	45100	11000	16700	27700	4200	6000	10200	35800	47200	83000
Other	36700	32000	68700	35600	37700	73300	28400	32300	60800	100700	102000	202700
Total adults with disability	73700	67500	141200	104000	103000	207100	87200	103800	190900	264900	274300	539200

Table A - 13: Sickness Benefit Time Series
Sickness Benefit Time Series - Official Counts
As at the end of September 2007 to 2011, by incapacity, age, gender, ethnicity

Source: Ministry of Social Development 2011

Notes:
This table includes working age only (18-64 years)
SB includes Sickness Benefit and Sickness Benefit Hardship

Incapacity Group	2007	2008	2009	2010	2011
Unspecified	24	28	25	40	11
Pregnancy related	1,377	1,382	1,317	1,227	1,224
Congenital conditions	151	206	232	251	266
Cancer	823	686	756	821	863
Infectious/parasitic diseases	357	716	798	863	803
Musculo-skeletal sys. disorder	7,956	7,170	8,208	8,519	8,765
Respiratory disorders	1,769	1,554	1,629	1,654	1,537
Genito-urinary disorders	755	538	610	619	562
Blood and blood forming organs	191	205	232	253	234
Skin disorders	429	340	387	379	407
Digestive system disorders	1,179	1,117	1,232	1,257	1,215
Nervous system disorders	1,569	1,373	1,632	1,685	1,780
Cardio-vascular disorders	2,841	2,758	3,179	3,227	3,173
Immune system disorders	211	45	53	52	59
Metabolic & endocrine disorders	2,382	2,572	2,865	2,989	2,824
Psychological or psychiatric conditions	18,110	19,035	22,813	24,199	24,512
Intellectual disability	148	110	108	107	121
Substance abuse	3,653	3,945	4,593	4,645	4,223
Sensory disorders	480	564	676	705	736
Accident	4,584	3,566	4,492	4,456	4,475
Ill defined conditions	5	293	543	709	860
Entry of foreign bodies	1	5	4	4	1
Total	**48,995**	**48,208**	**56,384**	**58,661**	**58,651**
Age	**2007**	**2008**	**2009**	**2010**	**2011**
18-19	1,893	2,189	2,448	2,318	2,053
20-24	5,157	5,635	6,800	6,951	6,668
25-29	4,471	4,537	5,339	5,414	5,304
30-34	4,471	4,393	4,922	5,014	4,835
35-39	5,215	5,012	5,765	5,776	5,337
40-44	5,503	5,360	6,136	6,458	6,512
45-49	5,907	6,007	6,943	7,242	7,333
50-54	5,715	5,339	6,537	7,067	7,418
55-59	5,733	5,060	5,955	6,443	6,795
60-64	4,930	4,676	5,539	5,978	6,396
Total	**48,995**	**48,208**	**56,384**	**58,661**	**58,651**
Gender	**2007**	**2008**	**2009**	**2010**	**2011**
Female	21,023	20,314	22,802	23,960	24,301
Male	27,972	27,894	33,582	34,701	34,350
Total	**48,995**	**48,208**	**56,384**	**58,661**	**58,651**
Ethnic Group	**2007**	**2008**	**2009**	**2010**	**2011**
Unspecified	934	996	1,344	1,409	1,279
Maori	13,085	13,043	15,079	15,682	16,216
NZ European	23,749	23,336	27,892	28,918	28,287
Other	7,984	7,664	8,497	8,974	9,131
Pacific Island	3,243	3,169	3,572	3,678	3,738
Total	**48,995**	**48,208**	**56,384**	**58,661**	**58,651**

Table A - 14: New Zealand General Social Survey 2008 (Statistics New Zealand)

Table 3.02
Selected NZGSS Measures
By age (10-year groupings)
April 2008–March 2009

Measure	Population	Age (years)						
		15–24	25–34	35–44	45–54	55–64	65–74	75 and over
		Percent						
Population distribution		*18.2*	*16.2*	*18.7*	*17.9*	*13.7*	*8.7*	*6.6*
Financial well-being								
Personal income								
$70,001 or more	12.2	0.3*	9.7	18.4	22.1	19.1	5.9	1.6*
$30,001–$70,000	36.1	17.4	51.4	45.5	46.0	37.8	20.8	13.6
$30,000 or less	51.6	82.3	38.8	36.1	31.9	43.1	73.3	84.8
Adequacy of income to meet everyday needs(1)								
More than enough	13.7	12.0	11.1	13.4	13.5	18.8	15.1	11.8
Enough	39.4	37.0	38.4	33.3	39.3	42.5	45.0	50.5
Just enough	32.4	30.8	36.0	36.4	30.3	28.0	30.0	32.8
Not enough	14.5	20.2	14.5	16.9	16.8	10.7	9.9	4.9
Self-assessed general health status								
Excellent	23.5	27.4	27.5	25.2	24.2	23.0	15.2	9.1
Very good	37.8	37.5	39.4	39.7	40.1	36.9	36.2	26.2
Good	26.2	25.4	24.1	26.4	23.2	24.1	32.3	37.3
Fair / poor	12.5	9.8	9.0	8.7	12.5	16.0	16.3	27.4

Table 4
Selected NZGSS Measures
By ethnicity
April 2008–March 2009

Measure	Population	Ethnicity			
		European	Māori	Pacific	Asian
		Percent			
Population distribution *(1)*		*78.9*	*12.6*	*4.5*	*8.6*
Financial well-being					
Personal income	12.2	13.6	6.8	7.3*	6.6
$70,001 or more	36.1	36.8	35.6	29.4	33.7
$30,001–$70,000	51.6	49.7	57.5	63.2	59.7
$30,000 or less					
Adequacy of income to meet everyday needs(2)					
More than enough	13.7	15.6	8.9	7.6*	6.1
Enough	39.4	41.9	30.0	23.5	32.7
Just enough	32.4	31.0	35.8	37.7	40.9
Not enough	14.5	11.5	25.3	31.3	20.3
Self-assessed general health status					
Excellent	23.5	24.8	20.1	20.0	18.0
Very good	37.8	38.1	32.5	35.6	40.9
Good	26.2	25.0	32.0	32.5	29.1
Fair / poor	12.5	12.1	15.4	12.0	11.9

Table 5
Selected NZGSS Measures
By family type
April 2008–March 2009

Measure	Population	Family type			
		Couple without child(ren)	Couple with child(ren)	One parent with child(ren)	Not in a family
		Percent			
Population distribution		*30.0*	*42.6*	*8.4*	*18.9*
Financial well-being					
Personal income					
$70,001 or more	12.2	13.6	14.8	5.1	7.7
$30,001–$70,000	36.1	40.6	35.3	28.6	34.2
$30,000 or less	51.6	45.8	49.9	66.3	58.1
Adequacy of income to meet everyday needs[1]					
More than enough	13.7	19.1	11.7	5.2	12.2
Enough	39.4	46.8	37.3	24.7	37.5
Just enough	32.4	26.5	35.9	35.3	33.5
Not enough	14.5	7.7	15.0	34.7	16.7
Self-assessed general health status					
Excellent	23.5	22.6	26.8	20.2	19.1
Very good	37.8	39.1	40.4	32.8	31.7
Good	26.2	26.0	24.0	29.4	29.8
Fair / poor	12.5	12.3	8.7	17.6	19.3

Table A - 15: Comparison of Ideal to actual cover

This table illustrates that while the average actual life insurance cover held is close to the ideal this disguises the real issue that it is uncommon for the actual cover held by the surveyed respondents to even approximately match the ideal life cover. The underinsurance gap is substantial for most of those surveyed.

Row	Actual Life cover earner 1	Actual Life cover earner 2	Ideal Life Cover earner 1	Ideal Life Cover # 1 x income	Ideal Life Cover earner 2	Ideal Life Cover # 2 x income	Life Cover no ret sum earner 1	Life #1 no ret sum x income	Life Cover no ret sum earner 2	Life #2 no ret sum x income	Life Cover 5x income earner 1	Life Cover 5x income earner 2
1	$0	$0	$537,484	9.3	$186,880	5.4	$401,436	7.0	$12,000	0.3	$287,935	$172,360
2	$0	$0	$406,854	9.5	$194,867	10.5	$307,460	7.2	$76,153	4.1	$214,160	$93,165
3	$0	$0	$991,170	12.4	$658,178	11.4	$768,723	9.6	$398,959	6.9	$399,395	$287,935
4	$0	$0	$12,000	0.3	$58,010		$12,000	0.3	$12,000		$214,160	$0
5	$400,000	$360,000	$481,330	8.4	$16,883	1.3	$480,221	8.3	$12,000	0.9	$287,935	$63,745
6	$0	$0	$196,226	5.7	$105,803	8.3	$142,841	4.1	$38,026	3.0	$172,360	$63,745
7	$0	$0	$550,028	9.6	$376,103	8.8	$186,206	3.2	$41,681	1.0	$287,935	$214,160
8	$0	$0	$206,977	3.6	$116,742		$206,977	3.6	$12,000		$287,935	$0
9	$500,000	$500,000	$12,000	0.3	$48,363		$12,000	0.3	$12,000		$214,160	$0
10	$0	$0	$766,702	7.6	$493,599	6.2	$405,463	4.0	$109,177	1.4	$506,850	$399,395
11	$0	$0	$301,382	3.8	$12,000	0.3	$301,382	3.8	$12,000	0.3	$399,395	$214,160
12	$0	$0	$348,277	8.1	$201,849	5.9	$241,162	5.6	$76,731	2.2	$214,160	$172,360
13	$200,000	$100,000	$483,958	11.3	$428,969	10.0	$246,501	5.8	$288,499	6.7	$214,160	$214,160
14	$0	$0	$12,000	0.3	$23,763		$12,000	0.3	$12,000		$172,360	$0
15	$0	$0	$12,000	0.9	$12,000		$12,000	0.9	$12,000		$63,745	$0
16	$0	$0	$12,000	0.9	$12,000		$12,000	0.9	$12,000		$63,745	$0
17	$0	$0	$12,000	0.3	$35,656		$12,000	0.3	$12,000		$214,160	$0
18	$50,000	$50,000	$12,000	0.9	$12,000		$12,000	0.9	$12,000		$63,745	$0
19	$0	$0	$40,313	0.7	$88,521		$40,313	0.7	$12,000		$287,935	$0
20	$0	$0	$12,000	0.3	$12,000		$12,000	0.3	$12,000		$172,360	$0
21	$250,000	$250,000	$431,897	10.1	$141,903	11.1	$393,719	9.2	$24,147	1.9	$214,160	$63,745
22	$50,000	$0	$14,605	0.7	$12,000		$14,605	0.7	$12,000		$111,655	$0
23	$0	$0	$12,000	0.3	$38,221		$12,000	0.3	$12,000		$172,360	$0
24	$0	$0	$256,676	6.0	$103,430	8.1	$165,245	3.9	$12,000	0.9	$214,160	$63,745
25	$40,000	$0	$60,386	2.3	$45,138	3.5	$21,896	0.8	$12,000	0.9	$129,085	$63,745
26	$0	$0	$135,436	5.2	$125,204	5.6	$51,355	2.0	$20,502	0.9	$129,085	$111,655
27	$8,000	$8,000	$19,904	0.9	$12,000	0.9	$19,904	0.9	$12,000	0.9	$111,655	$63,745
28	$0	$0	$393,654	9.2	$222,489	8.6	$329,730	7.7	$12,000	0.5	$214,160	$129,085
29	$80,000	$0	$12,000	0.3	$12,000		$12,000	0.3	$12,000		$214,160	$0
30	$0	$0	$207,200	8.0	$193,715	7.5	$34,963	1.4	$57,281	2.2	$129,085	$129,085
31	$200,000	$200,000	$12,000	0.3	$35,666		$12,000	0.3	$12,000		$172,360	$0
32	$0	$0	$282,839	8.2	$147,881	5.0	$133,949	3.9	$91,495	3.1	$172,360	$146,690
33	$0	$0	$12,000	0.4	$12,000		$12,000	0.4	$12,000		$146,690	$0
34	$500,000	$120,000	$629,641	10.9	$303,456	7.1	$321,644	5.6	$217,721	5.1	$287,935	$214,160
35	$145,000	$0	$606,635	10.5	$227,735	5.3	$153,400	2.7	$62,631	1.5	$287,935	$214,160
36	$200,000	$200,000	$198,620	4.6	$103,381	3.0	$163,150	3.8	$53,458	1.6	$214,160	$172,360
37	$346,000	$340,000	$802,401	13.9	$548,024	12.8	$432,420	7.5	$269,651	6.3	$287,935	$214,160
38	$250,000	$250,000	$702,660	12.2	$433,445	10.1	$295,923	5.1	$189,223	4.4	$287,935	$214,160
39	$0	$0	$254,292	7.4	$166,736	5.7	$164,600	4.8	$77,044	2.6	$172,360	$146,690
40	$0	$0	$156,982	5.4	$101,208	7.9	$103,424	3.5	$21,045	1.7	$146,690	$63,745

N.B. The min amount of $12,000 relates to funeral expenses. This can normally be covered by asset so no life cover may be appropriate.

Table A - 16: Household count by type and income

(Statistics New Zealand)

Household Composition and Total Household Income,
for Households in Private Occupied Dwellings, 2001 – Area Total NZ

HH Composition	Couple only	Couple only and other person(s)	Couple with child(ren)	Couple with child(ren) and other person(s)	One parent with child(ren)	One parent with child(ren) and other person(s)	Total One-family Households	Total
Household Income								
Loss	687	24	867	45	558	99	2277	3603
Zero Income	468	42	492	36	1281	93	2415	5247
$1 - $5,000	2115	60	1755	75	3477	321	7800	15945
$5,001 - $10,000	465	93	840	138	6018	210	7761	40215
$10,001 - $15,000	3843	147	3057	171	18966	1050	27234	107130
$15,001 - $20,000	30195	369	7266	288	15891	1149	55158	93942
$20,001 - $25,000	12141	606	8292	495	11751	1752	35040	62328
$25,001 - $30,000	45897	732	16587	630	10269	3078	77193	105369
$30,001 - $40,000	31461	1494	31833	1518	11205	3459	80973	118941
$40,001 - $50,000	33807	1620	38955	1848	8685	3402	88317	114408
$50,001 - $70,000	59274	3372	70932	3888	8526	3885	149877	178815
$70,001 - $100,000	37719	4332	54636	4257	3528	1863	106338	123447
$100,001 or More	36009	5469	59040	5187	2166	1275	109152	126243
Not Stated	36111	8391	64221	12990	24519	13314	159546	248604
Total	330201	26751	358879	31560	126840	34947	909078	1344240

HH Composition	Couple only	Couple only and other person(s)	Couple with child(ren)	Couple with child(ren) and other person(s)	One parent with child(ren)	One parent with child(ren) and other person(s)	Total One-family Households	Total
Household Income								
Loss	0.051%	0.002%	0.064%	0.003%	0.042%	0.007%	0.169%	0.268%
Zero Income	0.035%	0.003%	0.037%	0.003%	0.095%	0.007%	0.180%	0.390%
$1 - $5,000	0.157%	0.004%	0.131%	0.006%	0.259%	0.024%	0.580%	1.186%
$5,001 - $10,000	0.035%	0.007%	0.062%	0.010%	0.448%	0.016%	0.577%	2.992%
$10,001 - $15,000	0.286%	0.011%	0.227%	0.013%	1.411%	0.078%	2.026%	7.970%
$15,001 - $20,000	2.246%	0.027%	0.541%	0.021%	1.182%	0.085%	4.103%	6.988%
$20,001 - $25,000	0.903%	0.045%	0.617%	0.037%	0.874%	0.130%	2.607%	4.637%
$25,001 - $30,000	3.414%	0.054%	1.234%	0.047%	0.764%	0.229%	5.743%	7.839%
$30,001 - $40,000	2.340%	0.111%	2.368%	0.113%	0.834%	0.257%	6.024%	8.848%
$40,001 - $50,000	2.515%	0.121%	2.898%	0.137%	0.646%	0.253%	6.570%	8.511%
$50,001 - $70,000	4.409%	0.251%	5.277%	0.289%	0.634%	0.289%	11.150%	13.302%
$70,001 - $100,000	2.806%	0.322%	4.064%	0.317%	0.262%	0.139%	7.911%	9.183%
$100,001 or More	2.679%	0.407%	4.392%	0.386%	0.161%	0.095%	8.120%	9.391%
Not Stated	2.686%	0.624%	4.777%	0.966%	1.824%	0.990%	11.869%	18.494%
Total	24.564%	1.990%	26.690%	2.348%	9.436%	2.600%	67.628%	100.000%