



Report of the Measurement Review for a New Zealand living wage

**Prepared for Living Wage Movement
Aotearoa NZ**

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Executive Summary

Introduction

N.B. See main text for references

Since the first Living Wage report in 2013, significant progress has been made by Local Authorities and the New Zealand Parliament, each of whom are at various stages of becoming Living Wage Employers. Organisations and small businesses including for example, economic group BERL, the Wiri Licensing Trust and the New Zealand Nurses Organisation have become accredited Living Wage Employers, while energy company Vector Ltd has become the first large corporate enterprise to become accredited.

New Zealand is unfortunately a low wage economy when compared with like countries, being 18th on the OECD's ranking of average wages out of 35 countries. Australians on average earn 32 percent more than New Zealanders, Canadians 22 percent more and British workers 9 percent more. It therefore figures that Australia has had little interest in a living wage movement, while the UK, Canada and New Zealand have developed strong movements. New Zealand being the laggard in wage levels. The Ministry of Social Development's Household Incomes in New Zealand report finds that 40 percent of children in poverty have at least one adult in their family in full-time employment or self-employed.

This report discusses the income research carried out by the Family Centre Social Policy Research (FCSPRU) to provide an empirical basis for determining the level of a living wage for New Zealand, and its annual adjustments in relation to wage movement in the market. A clear empirical basis for setting the living wage has to draw on the most up to date data available on the range of items required to live with at least minimal comfort and enable participation in society.

The living wage is defined by Living Wage Movement Aotearoa NZ as:

the income necessary to provide workers and their families with the basic necessities of life. A living wage will enable workers to live with dignity and to participate as active citizens in society.

Participation refers to more than survival on the basic necessities, because it involves the ability to participate socially and even consider the future like a modest insurance policy. It embraces small but important things like being able to pay for children to enjoy a school trip, having a computer in the home and being able to mix with friends recreationally, albeit modestly.

Five Year Measurement Review

The original living wage rate in 2013 was set at \$18.40 per hour, which if earned by 1.5 full-time adults over the course of the year would be sufficient for a household of 2 adults and 2 children to live modestly and participate in society. The FCSPRU with the Living Wage research peer group decided that because the living wage was a wage in the market, the updates should relate primarily to movements in wages. The movement in the average ordinary time hourly rate, as provided by Statistics New Zealand's Quarterly Employment Survey (QES) was chosen to set the level for each annual update. However, it was also agreed that every five years, the methodology would be reviewed and if new databases or information sources enabled improved accuracy of the estimates, they would be

incorporated. It was also stated in the original report that if government transfers, particularly through tax changes occurred, then they would need to be incorporated into the following year's living wage adjustment.

This year 2018 is the year set aside for the first measurement review. New and appropriate information sources and databases have enabled FCSPRU to estimate more items from a needs-based perspective, rather than estimates that are simply taken from the Household Economic Survey (HES) which calculates expenditure by different income groups. FCSPRU already had needs-based estimates for food and rent costs and through the review they have been able to extend that to household energy, health, communication and education estimates.

The significant increase in disposable income for families with dependent children announced by government in the Families Package late last year, has been incorporated into the 2018 living wage estimate.

Key concepts in the rationale of a living wage

A living wage is an individual market wage. If it is paid at a level to support a household of 2 adult + 2 children on 1.5 incomes (one working adult full-time and another half time over 60 hours per week between them). The market pays a wage for workers to do particular jobs regardless of their family size, medical needs or other financial obligations. It has to be pitched somewhere and living wage movements internationally pitch it in relation to a family with children, because society is poorer if working families with children are still below the poverty threshold.

This is in contrast to a targeted welfare transfer. Targeted welfare transfers such as the domestic purposes benefit, the unemployment benefit and child tax credits are paid differently according to family size, particular needs and housing costs. The living wage is different. It is a market wage paid by employers, a market mechanism that is directed to lift the incomes of low paid workers, and it certainly achieves that.

A living wage attempts to address wellbeing in our community and, in particular, the problem of employees at the lower income end becoming increasingly socially excluded. Often, they struggle to afford even basic necessities, let alone live with dignity and participate as active citizens in society, despite the fact they are working full time. It is not compulsory, nor is the living wage movement anywhere in the world seeking to make it compulsory. It carries moral force and tests business ethics. The living wage enables an employer to know that what s/he pays a worker is sufficient for them to live modestly and participate in society.

The household composition of 2 adults and 2 children chosen in the original Report is pretty much in line with other jurisdictions for good reasons. If a living wage is to enable workers to live with dignity and to participate as active citizens in society, it must be sufficient for families with children. In other words, the adult earners in the household between them need sufficient income to be able to at least participate modestly in society with their children. If two incomes, one being fulltime, can't afford that, then it is less than a living wage. Two adults and two children were chosen as the household composition for these reasons and also because it is a common NZ family size.

The original Report chose two incomes because the Statistics New Zealand Household Labour Force Survey (HLFS) results for June 2012 show that in 68.5 percent of households with two adults and two dependent children, both adults were income earners. For the June

2017 quarter, both adults were employed in 74.5 percent of 2A+2C households (Statistics NZ 2017). It chose 1.5 incomes to allow one parent to be home with their children for half a working week however that may be divided. This is similar to the average of four like jurisdictions (USA 40 hours, UK 55.5 hours, New Zealand 60 hours and Canada 70 hours) at 56.38 hours, not that far from the 60 hours chosen in the original Report. The parameters are judgements as to what is considered reasonable in order for a family in New Zealand to live with dignity and to participate as active citizens in society.

Calculating living wage estimates for each item

In the review the researchers found new and appropriate information sources and databases that enabled them to estimate more items from a needs-based perspective, rather than estimates that are simply taken from the Household Economic Survey which calculates expenditure by different income groups. The living wage settings already used needs-based estimates for food and rent costs and through the review they have been able to extend that to household energy, health, communication and education estimates. For the other six budget items the estimates are based on HES data because no needs-based estimate could be found.

The expenditure items selected earlier and for this review, were from HES and included: food; clothing and footwear; actual rent costs for housing; household energy; household contents and services; health; transport; communication; recreation and culture; education – primary and early childhood; miscellaneous goods and services; and other expenditure e.g. exceptional emergencies, non-mortgage interest payments. In line with research in other countries, expenses were calculated for a household of two parents and two children with one full-time adult earner and another part-time earner on half full-time hours.

This year 2018, was the year set aside for the first measurement review. New and appropriate information sources and databases were found that enabled estimations of six of the twelve budget items from a needs-based perspective. Prior to this year only two out of twelve had been applied.

The Otago University's Food Cost Survey and MBIE's Rent Bond database continue to provide the best estimates for food and rent costs respectively. Otago University Wellington's Housing and Health research programme, the Building Research Association of New Zealand (BRANZ) Household Energy End-Use Project (HEEP) and the Institute of Professional Engineers (IPENZ) Multi-disciplinary investigation of energy use in New Zealand households provides a more accurate basis to establish the energy consumption in Kilowatt hours (kWh) required to maintain a three bedroom house at a healthy temperature throughout the year and also meet other energy requirements.

The Ministry of Health's service utilisation information collected from District Health Boards (DHBs) and Primary Health Organisations (PHOs) provides GP visits by age group and fees. Pharmac reports on prescription usage. Monthly broadband and mobile charges are widely available and enable a more accurate assessment of communication charges. The New Zealand Council for Educational Research (NZCER) keeps pace with the direct costs to parents for children at primary and secondary schools and the Survey of Income, Expenditure and Fees (SIEF) carried out by Early Childhood Education (ECE) Services provides a wealth of financial information on ECE including fees and subsidies. Other databases were also considered but not used in the final calculation.

For the other six budget items, HES data was used. In this review it was taken from the most recent HES 2016. It was purchased from Statistics NZ, covering expenditure categories and sub-categories for the two adult with two dependent children household type by income decile, average over deciles 1 to 5 (average of the lower half of household incomes for this household type). All HES based expenditure estimates in this review used the averages for households that had reported expenditure. The 2016 category and sub-category values were inflation adjusted for the year to June 2017 using the Consumers Price Index (CPI) to reflect 2017 cost levels for the two adult and two dependent children household type.

The other critical factor that the review had to incorporate was the new Government's Families Package designed to reduce child poverty in New Zealand. The package boosts the incomes of low- and middle-income families with children by increasing the Family Tax Credit and raising the abatement threshold. The package contributed to reducing upward pressure on the level of the living wage.

The 2018 Living Wage

The 2018 Living Wage was calculated item by item as the foregoing text has explained. A weekly total comprising the addition of the agreed estimates for each of the 12 items was prepared. This is a household total, not an individual total. The net weekly total was then multiplied to become an annual net total. The gross income required to receive the net amount was then calculated. This was a detailed calculation that took into account the effects of income tax, tax credits (including the latest Families Package), childcare support and the accommodation supplement. Finally, the hourly rate was derived by dividing the total gross household income by 52 (52 weeks in a year) and then dividing that result by 60 (representing 60 hours per week or one full time working parent and another halftime/20 hours per week working parent, i.e. 1.5 fulltime workers).

The item estimates showed the following weekly expenses: Food \$212; Clothing and footwear \$48.45; Actual rentals for houses \$332; Household energy \$72.14; Household contents and services \$39.13; Health \$23.45; Transport \$131.56; Communication \$31.28; Recreation and culture \$92.12; Education \$44.80; Miscellaneous goods and services \$72; Other expenditure \$70. NB. See the main text for tables.

These itemised results led to a total weekly budget estimate for a household of two adults and two dependent children of \$1,169. This multiplied to an annual net total of \$60,784, which in turn required an annual gross income of \$64,059 to be earned by two adults over 60 hours per week. That produced an hourly rate of \$20.53. As in previous years, the final figure was rounded to the nearest 5 or 10 cents mark to provide, in this case, a 2018 Living Wage figure of **\$20.55**.

This produces a disposable household income that appropriately sits between median household income and the poverty thresholds. It is 73 percent of median disposable household income in New Zealand and 61 percent of the mean disposable income for households with two adults and two children respectively.

This estimate (\$20.55) is \$4.05 above the new (1 April 2018) minimum wage, or \$162 per week. The difference between the two wage settings is 24.5 percent of the minimum wage. Around a third of wage and salary earners in New Zealand are below the living wage rate. On this rate, a single earner working full-time would have a gross income of \$42,755.

The positive impact of the Families Package on lowering the expected level of the living wage for 2018 is quite apparent. If it was not forthcoming, then the hourly rate with the more precise calculations would be \$22.45 instead of \$20.55. The difference is almost \$2 an hour.

Introduction

The first Report on measuring a New Zealand Living Wage was launched during February 2013 (King and Waldegrave 2012) and took effect 1 July that year. The movement leading to that launch and the advocacy to promote a living wage since, has been consistent, had widespread media coverage and become well-known among New Zealanders. Wellington City Council has made a commitment to seek accreditation as a Living Wage Employer during its current term and has already lifted the wages of directly-employed staff, as well contracted cleaners and security guards. The New Zealand parliament and Auckland City Council have committed to the first step for their directly employed workers (not yet the staff of organisations they contract). Cleaners and catering staff working in parliament will move to a living wage as their contracts are renegotiated over this year and next.

The business economic group BERL, the Wiri Licensing Trust and the New Zealand Nurses Organisation are three of an increasing number of organisations and small businesses who are accredited Living Wage Employers, while energy company Vector Ltd has become the first large corporate enterprise to become accredited. The recent Deloitte BusinessNZ Election Survey August 2017¹, reported that of the 575 businesses taking part, a majority, albeit slim (44% to 43 % with 14% unsure) said they support the concept of a living wage and of those who did, 91% would be prepared to pay a living wage in the near future (p.63).

New Zealand unfortunately, is a low wage economy when compared with like countries, being 18th on the OECD's ranking of average wages out of 35 countries (OECD 2018). Those with wage levels lower than New Zealand are largely Central and Eastern European countries. Australians on average earn 32 percent more than New Zealanders, Canadians 22 percent more and British workers 9 percent more. It therefore figures that Australia has had little interest in a living wage movement, while the UK, Canada and New Zealand have developed strong movements. New Zealand being the laggard in wage levels. It is sobering to note the Ministry of Social Development's Household Incomes in New Zealand report finds that 40 percent of children in poverty have at least one adult in their family in full-time employment or self-employed (Perry, 2017) p144. This is an important context for a living wage movement.

This report discusses the income research carried out by the Family Centre Social Policy Research (FCSPRU) to provide an empirical basis for determining the level of a living wage for New Zealand, and its annual adjustments in relation to wage movement in the market. A clear empirical basis for setting the living wage has to draw on the most up to date data available on the range of items required to live with at least minimal comfort and enable participation in society. It must be transparent and clearly understandable for it to be drawn upon by New Zealand businesses and organisations. As such, it needs to relate to living wage calculations in like countries and stand up to the same sort of assessment and scrutiny.

The Ministry of Business, Innovation and Employment (MBIE) using their Strategic Research and Evaluation, Labour Group, carried out an analysis of calculations in our initial report (ibid) for the then Minister of Labour Hon Simon Bridges. They concluded that:

"The data used to calculate the LW has been carefully constructed and the methodology is comprehensive" and

¹ https://www.businessnz.org.nz/_data/assets/pdf_file/0006/129345/Deloitte-BusinessNZ-Election-Survey-2017.pdf

“The methodology makes reasonable assumptions about costs (eg household will be renting not buying homes)” (MBIE 2013)

The living wage is defined by Living Wage Movement Aotearoa NZ as:

the income necessary to provide workers and their families with the basic necessities of life. A living wage will enable workers to live with dignity and to participate as active citizens in society.

It is the second sentence that distinguishes the living wage from the ‘poverty’ or ‘income hardship’ thresholds. Participation refers to more than survival on the basic necessities, because it involves the ability to participate socially and even consider the future like a modest insurance policy. It embraces small but important things like being able to pay for children to enjoy a school trip, having a computer in the home and being able to mix with friends recreationally, albeit modestly.

Five Year Measurement Review

The first report calculated the living wage using information about household expenditure available from secondary data sources such as the Statistics New Zealand Household Economic Survey (HES), the annual Food Cost Survey carried out by the University of Otago Department of Human Nutrition, rent levels from the Rent Bond database published by the Ministry of Business Innovation and Employment (MBIE) and advertised childcare costs. The databases that provided the food, housing and childcare expenditure items can be conceived of as needs-based. They provided minimum estimates to meet the item costs. The estimated costs of all other items were based on the average of the expenditures on those items of households whose incomes were in the first five deciles, or bottom half, of the income distribution for households with two adults and two dependent children, as reported in the HES. HES records what households actually spend within various income deciles, rather than measure need per se. Needs-based calculations for these items were not found.

The expenditure items selected then and for this review, were from HES and included: food; clothing and footwear; actual rent costs for housing; household energy; household contents and services; health; transport; communication; recreation and culture; education – primary and early childhood; miscellaneous goods and services; and other expenditure e.g. exceptional emergencies, non-mortgage interest payments. In line with research in other countries, expenses were calculated for a household of two parents and two children with one full-time adult earner and another part-time earner on half full-time hours.

The total of all estimated item costs represents the amount of disposable income required to meet those costs. The corresponding amount of gross income required to produce that amount of disposable income is identified in a calculation that takes into account the effects of KiwiSaver contributions, income tax on the two incomes, tax credits based on the total household income, and the Accommodation Supplement entitlement (if any). The total household gross income then forms the basis for calculating the living wage hourly rate. The hourly rate is derived by dividing the total gross household income by 52 (52 weeks in a year) and then dividing that result by 60 (representing 60 hours per week or one full time working parent and another halftime/20 hours per week working parent, i.e. 1.5 fulltime workers).

The original living wage rate in 2013 was set at \$18.40 per hour, which if earned by 1.5 full-time adults over the course of the year would be sufficient for a household of 2 adults and 2 children to live modestly and participate in society. The FCSRU with the Living Wage

research peer group decided that because the living wage was a wage in the market, the updates should relate primarily to movements in wages. The movement in the average ordinary time hourly rate, as provided by Statistics New Zealand's Quarterly Employment Survey (QES) was chosen to set the level for each annual update. However, it was also agreed that every five years, the methodology would be reviewed and if new databases or information sources enabled improved accuracy of the estimates, they would be incorporated. It was also stated in the original report that if government transfers, particularly through tax changes occurred, then they would need to be incorporated into the following year's living wage adjustment.

This year 2018 is the year set aside for the first measurement review. We have found new and appropriate information sources and databases that enable us to estimate more items from a needs-based perspective. Otago University's Food Cost Survey and MBIE's Rent Bond database continue to provide the best estimates for food and rent costs respectively. Otago University Wellington's Housing and Health research programme, the Building Research Association of New Zealand (BRANZ) Household Energy End-Use Project (HEEP) and the Institute of Professional Engineers (IPENZ) Multi-disciplinary investigation of energy use in New Zealand households provides a more accurate basis to establish the energy consumption in Kilowatt hours (kWh) required to maintain a three bedroom house at a healthy temperature throughout the year and also meet other energy requirements.

The Ministry of Health's service utilisation information collected from District Health Boards (DHBs) and Primary Health Organisations (PHOs) provides GP visits by age group and fees. Pharmac reports on prescription usage. Monthly broadband and mobile charges are widely available and enable a more accurate assessment of communication charges. The New Zealand Council for Educational Research (NZCER) keeps pace with the direct costs to parents for children at primary and secondary schools and the Survey of Income, Expenditure and Fees (SIEF) carried out by Early Childhood Education (ECE) Services provides a wealth of financial information on ECE including fees and subsidies. Other databases were also considered but not used in the final calculation. The information and data sources considered for each expenditure item are set out in figure 1.

The HES data in this review was taken from the most recent HES 2016. It was purchased from Statistics NZ, covering expenditure categories and sub-categories for the two adult with two dependent children household type by income decile, average over deciles 1 to 5 (average of the lower half of household incomes for this household type). All HES based expenditure estimates in this review use the averages for households that have reported expenditure. The 2016 category and sub-category values have been inflation adjusted for the year to June 2017 using the Consumers Price Index (CPI) to reflect 2017 cost levels for the two adult and two dependent children household type.

The other major change that needed to be factored into the review of the measurement of the living wage was brought about by the new Government, in late December 2017, announcing the Families Package (Treasury 2017) as part of the Prime Minister's commitment to reduce child poverty in New Zealand substantially². The package boosts the incomes of low- and middle-income families with children by increasing the Family Tax Credit and raising the abatement threshold. Furthermore, increases to the Accommodation Supplement were also announced. These contribute to reducing upward pressure on the level of the living wage.

² https://www.parliament.nz/en/pb/bills-and-laws/bills-proposed-laws/document/BILL_76267/child-poverty-reduction-bill

Where quarterly reporting data is used, this report bases calculations on the same annual period as the original Report, i.e. June to June. In such cases the living wage estimate for any particular year uses data for the year to June for the previous year.

Figure 1. Information and data sources included in the review.

Expenditure categories from HES plus childcare	Data sources for review	
	Original sources chosen	Sources used for review
Food	Food cost survey	<ul style="list-style-type: none"> • Food cost survey / HES
Clothing and footwear	HES	<ul style="list-style-type: none"> • HES
Actual rentals for housing	Rent Bond Database	<ul style="list-style-type: none"> • Rent Bond Database / HES
Household energy	HES	<ul style="list-style-type: none"> • BRANZ, HEEP & IPENZ Energy Use in NZ / HES
Household contents and services	HES	<ul style="list-style-type: none"> • Vero's Content valuation guide / HES
Health	HES	<ul style="list-style-type: none"> • Service Utilisation and GP fees data for 2016 from the Ministry of Health • Pharmac reports of prescriptions • HES
Transport	HES	<ul style="list-style-type: none"> • The AA Running Costs Report • Ministry of Transport's "How New Zealanders travel" report • Public transport monthly/weekly passes prices • HES
Communication	HES	<ul style="list-style-type: none"> • List of prices from main communication carriers • HES
Recreation and culture	HES	<ul style="list-style-type: none"> • HES
Education: Primary and Early Childhood Education	HES / advertised childcare costs	<ul style="list-style-type: none"> • New Zealand Council for Educational Research survey: School resources, culture and connections. Wellington. • ASG calculator • ECE SEIF • Annual ECE Data Summary Report • HES
Miscellaneous goods and services	HES	<ul style="list-style-type: none"> • HES
Other expenditure	HES	<ul style="list-style-type: none"> • HES

The rest of this report, after setting out some explanation and rationale for the living wage, takes the reader through the databases and calculations item by item, leading to an addition of each item and the gross hourly rate required to meet a living wage for 1 September 2018. Appendices provide a more in-depth explanation of the databases used and more information about each calculation.

Key concepts in the rationale of a living wage

A living wage is a market wage

A living wage is an individual market wage. If it is paid at a level to support a household of 2 adult + 2 children on 1.5 incomes as it is in New Zealand and most other countries where it is applied, then it will be more generous to a household of 2 adults without children and more stringent for a family with 3 or more children. It will be more generous to a family without a disabled child than to a family with one. The market pays a wage for workers to do particular jobs regardless of their family size, medical needs or other financial obligations. It has to be pitched somewhere and living wage movements internationally pitch it in relation to a family with children, because society is poorer if working families with children are still below the poverty threshold.

This is in contrast to a targeted welfare transfer. Targeted welfare transfers such as the domestic purposes benefit, the unemployment benefit and child tax credits are paid differently according to family size, particular needs and housing costs. The living wage is different. It is a market wage paid by employers, a market mechanism that is directed to lift the incomes of low paid workers, and it certainly achieves that.

Both Treasury (Galt & Palmer, 2013) and Boston and Chapple (2014) reviewed the living wage without reference to the broad literature in the field. They complain that the living wage is not effective in reducing poverty for all people in society and advocate that targeted welfare payments alone help the poorest people. This misses the whole purpose of a living wage. It was never designed to reduce all poverty in society. Rather its aim is to ensure people in paid employment are not in poverty and are able to participate in society. It is a wage in the market place. Those employers who pay it have agreed to do so voluntarily.

Although it has an important role in addressing growing inequalities, it is not a welfare transfer. People live in households but are paid in the market as individuals regardless of their household obligations. As 40 percent of children in poverty have at least one adult working full-time (Perry, 2017), a living wage contributes to poverty reduction substantially. Furthermore, it is important that when people come off benefits and find work, they are paid a decent wage.

The living wage is not mandatory

A living wage attempts to address wellbeing in our community and, in particular, the problem of employees at the lower income end becoming increasingly socially excluded. Often, they struggle to afford even basic necessities, let alone live with dignity and participate as active citizens in society, despite the fact they are working full time.

Certain commentators, again the Treasury and Boston and Chapple (op.cit.), present alarming figures of costs to the country if the mandatory minimum wage was lifted to the level of the living wage. The network of organisations promoting the living wage in New Zealand, have been very clear that the living wage is quite separate from the statutory compulsory minimum wage. It is not suggested that the minimum wage be lifted to the level of the living wage. They are quite separate entities and have different functions.

The living wage is not compulsory, nor is the living wage movement anywhere in the world seeking to make it compulsory. It carries moral force and tests business ethics. The living wage enables an employer to know that what s/he pays a worker is sufficient for them to live modestly and participate in society. It has proved very attractive to many employers and studies show it pays off in terms of morale and productivity.

Household of 2 adults and 2 children

Of the three other main countries that have adopted living wage practices, two of them have chosen a 2 adult and 2 child family as their base unit for calculating a living wage. Those two are Canada (Richards et. al. 2008) and the US. The US is a little complicated in that the rules vary from State to State and city to city but generally they apply the 2A+2C formula (Maloney and Gilbertson 2013).

The UK is the only jurisdiction that uses weighted averages for different family types, including single people through to couples with children (GLA 2013). The weighted averages of single families, families without children and families with children skew the living wage in the UK towards a household with less than 2 adults and less than 2 children. It has not been adopted elsewhere in the world probably for that reason.

The household composition of 2 adults and 2 children chosen in the original Report is pretty much in line with other jurisdictions for good reasons. If a living wage is to enable workers to live with dignity and to participate as active citizens in society, it must be sufficient for families with children. In other words, the adult earners in the household between them need sufficient income to be able to at least participate modestly in society with their children. If two incomes, one being fulltime, can't afford that, then it is less than a living wage. 2 adults and 2 children were chosen as the household composition for these reasons and also because it is a common NZ family size. Furthermore, it is close to the minimum average sized family required to ensure natural population replacement.

The New Zealand living wage focus on a two adult and two child household has been criticised as an example of poor targeting because single people receiving the living wage rate were better off in equalised disposable income terms than couples with children (Galt & Palmer, 2013) (Crampton, 2015). But this criticism ignored the relationship between the market and non-market components of the living wage (King, 2016). Unlike government transfers, market wages are not targeted according to need: employers are not, for example, expected to pay the sole income earner of a three-person household a multiple of what they pay a single person doing the same job. The living wage has to be set on some basis, and as noted above, it is transparently set in line with other jurisdictions to include one full-time and one half-time income for a family with children to be able to participate modestly in society.

1.5 incomes

The original Report chose two incomes because the Statistics New Zealand Household Labour Force Survey (HLFS) results for June 2012 show that in 68.5 percent of households with two adults and two dependent children, both adults were income earners. For the June 2017 quarter, both adults were employed in 74.5 percent of 2A+2C households (Statistics NZ 2017). It chose 1.5 incomes to allow one parent to be home with their children for half a working week however that may be divided.

The hours worked to calculate a living wage does vary from jurisdiction to jurisdiction. The Canadians chose 70 hours, 35 hours each for both parents, whereas the US formulas tend to use the income of one parent in fulltime employment. The UK uses 1.44 incomes, not that different from the New Zealand setting at 1.5. In the UK though, full time work is officially 38.5 hours and so they calculate 55.5 hours (38.5 + 17 hours).

The average of the four jurisdictions (USA 40 hours, UK 55.5 hours, New Zealand 60 hours and Canada 70 hours) is 56.38, not that far from the 60 hours chosen in the original Report. The parameters are judgements as to what is considered reasonable in order for a family in New Zealand to live with dignity and to participate as active citizens in society.

Calculating living wage estimates for each item

The estimate of necessary expenditure for each expenditure category in this review is based on evaluation and comparison of available data and information sources as outlined above. The commentary for each expenditure category includes reference to the associated HES results alongside the results based on other sources of information. Further information about the chosen methods of calculation are provided in the Appendices.

The HES tables used in this review are based on the averages of the expenditures of two adults with two dependent children households over deciles 1 to 5 (average of the lower half of household incomes for this household type) that actually reported having spent money on them. This means that the averages for separate sub-categories and categories are usually based on different numbers of households in each sub/category. As a consequence of this, the sub-category averages in HES rarely add to the same value as the category total. This is simply illustrated in Table 1 following, where the averages for clothing and footwear are based respectively on the numbers of households that answered each of the two subcategories (clothing and footwear). The category total is based on all those who responded to both or either of the two sub-categories

Food

Food costs have been calculated from Otago University Food Cost Survey for 2017 using the same procedure as used for the original living wage calculation. Food cost information is published annually by the University of Otago Department of Human Nutrition (Dept. of Human Nutrition, 2017). Three sets of estimates are produced to represent the costs of meeting basic, moderate and liberal diets for each of the following categories

The estimated are calculated using the specified amounts of the food categories (e.g. meat, bread, eggs, fruit, etc) needed for one week. These are based on the New Zealand Food and Nutrition Guidelines and will meet the nutritional needs of most healthy people. While the food categories are the same for men, women and children, the amounts are appropriate for each age and sex group and vary between regions.

The costs are calculated assuming home preparation of meals and dishes and purchased from supermarkets. Food preparation skills are assumed to be adequate, as are the use of standard serving sizes.

The **Basic** cost category assumes that all foods will be prepared at home. It includes the most commonly consumed fruits and vegetables and the lowest priced items within each food category.

The mean of the various combinations of two adults and two children, based on children's pre-school and primary school ages (including intermediate school) was chosen. The mean national figure is **\$212** per week. This is lower than the HES (expenditure) figure of \$225 which would have included households with older children and adolescents whose food costs are higher than those of younger children.

Clothing and footwear

The review has chosen to maintain the HES estimate of **\$48.40** for households reporting expenditure on clothing and footwear as shown in Table 1. No needs-based estimate could be found.

Table 1. HES Clothing and footwear

CLOTHING AND FOOTWEAR: 2016 HES CPI adjusted to June 2017. 2A+2C households. Income deciles 1-5.	Average weekly
	Reporting households
03.1 Clothing	43.36
03.2 Footwear	24.26
03 Total Clothing and footwear	\$48.45

Rents

Rent costs have been calculated from information provided by the Tenancy Bond Database maintained by the Ministry of Business, Innovation and Employment (MBIE), as in the original report. National average rents for three-bedroom houses at the top of the bottom quartile have been calculated from the rent information included with the MBIE rent bond data (MBIE 2017). The Tenancy Bond Database reports average (actual) rents at the top of each rent quartile by region and area across the country.

The three-bedroom house is used because this is the most appropriate minimum number of bedrooms necessary for the target household to avoid crowding. The Canadian crowding measure, used by Statistics NZ, requires separate bedrooms for children of different gender from the age of five years (see appendix).

The national average at 1 June 2017 is **\$332.00³**. This estimate is just five dollars above the HES average of \$327 (see Appendix 1., Table 16).

Household energy

Previously the HES database was used to estimate household energy costs. However, the University of Otago Housing and Health research programme, the Building Research Association of New Zealand (BRANZ) Household Energy End-Use Project (HEEP) and the Institute of Professional Engineers (IPENZ) Multi-disciplinary investigation of energy use in New Zealand households now enable us to establish the energy consumption in Kilowatt hours (kWh) required to maintain a three bedroom house at a healthy temperature throughout the year and also meet other energy requirements. Once the energy consumption requirements in kWh for the target households in various NZ regions have been estimated, the cost of that energy was calculated using information available from the MBIE database of residential sales-based electricity costs.

Household energy costs have been estimated using the three bedroom house annual energy requirements calculated by Lloyd (2006) (Howden-Chapman et al., 2012) using

³ <http://www.mbie.govt.nz/info-services/housing-property/sector-information-and-statistics/rental-bond-data>

thermal modelling and the concept of 'heating degree days' to relate daily temperatures to demand for fuel to heat a three bedroom house of 90-100 square metres in each of four regions: Auckland, Wellington, Canterbury and Otago.

From the separate energy requirements for each of the four regions a weighted national average energy requirement, and cost, has been calculated that fairly represents the distribution of energy requirements across New Zealand, as shown in Table 2. and described below.

A simple average of the energy requirements for the four regions covered by Lloyd (2006) would give undue weight to the southern regions, which have fewer houses but higher energy costs, and result in a disproportionately high average cost estimate, in this case \$83.32 per week.

The method shown in Table 2 divides the total energy required by the three-bedroom houses in the four regions by the total number of such houses reported by Stats NZ from the 2016 Census. This produces a weighted average weekly energy cost of **\$72.14**. This is ten dollars higher than the HES estimate of \$62.30 (see Appendix 1., Table 17) which may reflect the inadequate heating of many New Zealand houses (O'Sullivan et. al. 2017).

Table 2. Calculation of weighted average household energy cost

Region	Required energy per 3 brm house (kwh)	No. 3 brm houses	Total energy (kwh)		2017 electricity price incl. line charges		Weighted average cost per week
Auckland	9,500	181,860	1,727,670,000				
Wellington	13,900	72,561	1,008,597,900				
Canterbury	17,200	85,368	1,468,329,600				
Otago	19,600	33,924	664,910,400				
Totals		373,713	4,869,507,900				
Average energy per 3 brm house (kwh)⁴			13,030	x	0.2879	=	\$72.14

Household contents and services

The primary source of information for estimating expenditure on household contents and services is the HES. It was proposed that the HES based estimates could be evaluated against insurance company content valuation guide such as those provided by Vero⁵ by depreciating the values to produce estimates of annual costs associated with those items. However, selecting the items involved arbitrary judgements and the depreciation produced unconvincing results.

Another potential source of information identified was the New Zealand Now cost of living calculator, but as the expenditure estimates produced by this calculator are based on the HES, it is not a viable alternative source of expenditure information to the HES.

⁴ This is the quotient of 4,869,507,900 divided by 373,713.

⁵ <https://www.vero.co.nz/documents/cis/domestic-contents-valuation-guide-2014.pdf>

In view of the uncertainty surrounding this method of verifying the HES total, it seems prudent to continue to base the estimate on the HES. The weekly total average of **\$39.13** shown in Table 3 is used.

Table 3. HES Household contents and services

HOUSEHOLD CONTENTS AND SERVICES: 2016 HES CPI adjusted to June 2017. 2A+2C households	Average weekly
	Reporting households
05.1 Furniture, furnishings and floor coverings	23.32
05.2 Household textiles	7.37
05.3 Household appliances	21.33
05.5 Tools and equipment for house and garden	10.13
05.6 Other household supplies and services	14.99
05 Total Household contents and services	\$39.13

Health

Previously the HES database was used to estimate household health costs. However, GP utilisation data is available as are Pharmac reports. Information about GP fees is collected annually in February by the Ministry of Health from all district health boards (DHBs) and service utilisation information is collected quarterly from PHOs (Primary Health Organisations). The total number of nurse and GP visits are broken down by age group, quintile, ethnicity and gender; also available is the average number of nurse and GP visits per person age group, quintile, ethnicity and gender⁶. Over all age groups, the average number of GP consultations per person is 3.0.

In the target family of two adults and two dependent children, one child is preschool and the other at primary school are eligible for free GP visits⁷ because they are under 13 years. Some GPs do charge and the information about GP fees reports small average fees for children in this age group. Children aged under 13 are also not subject to co-payments for prescription medicines⁸.

Table 4. GP average annual service utilisation and fees by age group

Household members		Average GP visits per annum	Age group	Average consultation fee \$	Age group	Average annual GP consultation cost \$
Children	1	3.8	<5	0.11	0-5	\$0.42
	2	1.7	5 -14	0.31	6-12	0.53
Adults	1	2.7	25-64	33.85	25-64	91.40
	2	2.7	25-64	33.85	25-64	91.40
Annual total						\$183.75
Weekly total						\$3.53

⁶ <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/primary-care-data-and-stats> (and information obtained through an OIA request).

⁷ <https://www.health.govt.nz/our-work/primary-health-care/primary-health-care-subsidies-and-services/zero-fees-under-13st>

⁸ <https://www.health.govt.nz/our-work/primary-health-care/primary-health-care-subsidies-and-services/pharmaceutical-co-payments>

Table 4 summarises the GP utilisation rates and fees for the child and adult age groups and the resulting annual and weekly costs. Average annual GP fees yield an annual GP visit cost of \$183.75 or \$3.53 per week if each member of the family attended a GP for the average number of times a year for those in their age group.

Pharmac reported that in 2016 there were 44.4 million prescriptions of funded items⁹ and 13.2 million GP consultations⁶, making an average of approximately 3.4 prescriptions per patient consultation. The 13.2 million GP consultations divided by the population of 4.7 million¹⁰ represents an average of 2.8 consultations per person. This is close to the average of 3.0 reported by the Ministry of Health, above.

With a total average of 5.4 GP visits per annum (2.7+2.7, Table 4) by household adults and a pharmacy charge of five dollars per prescription, the target household will, on average, spend $5.4 \times 3.4 \times 5 = \91.80 dollars per annum on prescription items, or \$1.77 per week.

Added to the prescription part charges, we have allowed for two repeat prescription GP charges at \$20 totalling \$40 for the year and \$0.77 per week.

Combined with the GP consultation average weekly spend of \$3.53, the total average weekly cost of GP associated primary health care and associated medication is \$6.07.

Finally, dental costs for the two adults are estimated based on an average of costs associated with treatments covering extractions, fillings, cleaning and xrays of \$143¹¹. For two adults having such treatment once a year the annual cost would be \$286.00, or \$5.50 per week.

In total, the weekly GP, medication and dental costs are estimated to be \$11.57.

Table 5. HES Health

HEALTH: 2016 HES CPI adjusted to June 2017. 2A+2C households. Income deciles 1-5.	Average weekly
	Reporting households
06.1 Medical products, appliances and equipment	13.63
06.2 Out-patient services	52.74
06 Total Health	\$34.13

We can then add to that non-prescription costs. HES data reported in Table 5 indicates \$13.65 a week medical products, appliances and equipment. If we deduct from that the \$1.77 for prescription costs, it leaves \$11.88 to cover other non-prescription medicines and products such as pain relief, cough remedies, sticking plaster, and so on. Weekly health costs then come to $\$11.57 + \$11.88 = \mathbf{\$23.45}$.

The \$23.45 is almost one third less than the estimate for expenditure by households recording spending on health in the HES, which might be due to health costs being an irregular expense and therefore more difficult to quantify accurately over time. However, the significance of this difference is lessened by the government's plan to reduce GP consultation fees for adults to \$10 for non-Community Services Card holders. This means that the costs of primary health care are very likely to fall in the near future.

⁹ <https://www.pharmac.govt.nz/assets/annual-report-2015-2016.pdf>

¹⁰ <https://www.stats.govt.nz/topics/population>

¹¹ <https://www.enz.org/dental-costs-in-new-zealand.html>

If the household is eligible for a Community Services Card it might result in reduced costs, but as this is not certain for any particular household¹² it has not been included in the calculation.

Transport

Private transport costs have been estimated using information from The New Zealand Household Travel Survey conducted by the Ministry of Transport, and small car running costs estimated by the Automobile Association for 2013.¹³ The travel survey reports the average kilometres per year during the July 2011 to July 2014 period.¹⁴ ¹⁵ The average kilometres per year per car or van driver was 6,811km and the running costs rate per kilometre for a small car travelling 7,000km per year was \$0.904 per km. This amounts to $6,811 \times 0.904 = \$6,157$ per annum or \$118.40 per week. This is much higher than the expenditure reported by HES of \$63.68 as shown in Table 6. However, the AA operating costs are calculated on ownership of a new vehicle for the first 5 years and include depreciation, which is one of the biggest influences on the overall result. Given that living wage households are unlikely to purchase new or late model vehicles, and in view of the variable costs of used cars and differences in the use of public transport, it was considered prudent to adopt the HES average transport estimate. The reporting households' average weekly expenditure was **\$131.60**.

Table 6. HES Transport

TRANSPORT: 2016 HES CPI adjusted to June 2017. 2A+2C households. Income deciles 1-5.	Average weekly
	Reporting households
07.1 Purchase of vehicles	140.74
07.2 Private transport supplies and services	63.68
07.3 Passenger transport services	62.21
07 Total Transport	\$131.56

¹² Many prescription items are subsidised by the government. People with a Community Services Card pay a small fee and for children under 6 years the prescription items are free. Sometimes there are part-charges or other pharmacy fees that still need to be paid.

(<https://www.workandincome.govt.nz/products/a-z-benefits/community-services-card.html#null>)

¹³ <http://www.aa.co.nz/assets/site-information/running-costs/2013-Petrol-Running-Costs.pdf>

¹⁴ <http://nzdotstat.stats.govt.nz/wbos/Index.aspx?DataSetCode=TABLECODE7431>

¹⁵ "The New Zealand Household Travel Survey has been conducted by the Ministry of Transport since 2003.

"The survey was designed to produce regional results on a four-year moving average basis. In 2008 the survey was expanded which means that three-yearly results can be produced for almost all regions.

"For the survey, each member of the selected households is asked to keep a record of all travel on two specified travel days. Each member is then interviewed in person about their travel by trained survey interviewers. (For children under ten, the interview is with a parent or caregiver).

"A 'trip leg' is a non-stop leg of travel by a single mode. For example, driving to a friends with a stop at the shops on the way would be two trip legs. Catching a bus to work could involve at least three trip legs - the walk to the bus stop, the bus leg to town and the walk from the bus stop to work.

"Walking trips are included if they are 100m or more and / or involve crossing a road.

"Travel off-road or on private property is not included. That is, tramping, walking or driving around the farm, walking in shopping malls etc is excluded from the survey."

(<http://www.transport.govt.nz/research/travelsurvey/data-and-spreadsheets-household-travel-survey/Main> Main Urban Areas spreadsheet)

Communication

Previously the HES database was used to estimate household communication costs. However, information about broadband internet and mobile phone costs is readily available. Table 7 shows the published monthly charges for a range of nine uncapped-broadband internet plans for seven New Zealand providers. The plan prices vary according to differences in their conditions, such as exit fees and inclusion of additional services. The weekly average for these prices is \$19.98.¹⁶ One broadband plan has been allowed for our target household.

Table 7. Broadband internet prices

Provider	Monthly charge \$
My Republic	74.99
Stuff Fibre	79.50
Vodafone	79.99
Slingshot	84.95
My Republic	84.99
Orcon	89.95
Vodafone	94.99
Spark	94.99
2 Degrees	95.00
Monthly average	\$86.59
Weekly average	\$19.98

Mobile phone use has been calculated on the basis of two members of the household having a mobile phone with a basic monthly plan. The cost estimate for this is based on the average of the plans offered by the four providers listed in Table 8.

Table 8. Mobile phone monthly plan prices

Provider	Monthly charge
Skinny	16.00
Vodafone	19.00
Spark	19.00
2Degrees	19.00
Monthly average	\$18.25
Weekly average	\$4.21

With each of two members using a monthly plan based on this weekly average, the cost would be $4.21 \times 2 = \mathbf{\$8.42}$ per week.

The estimate for mobile phone purchase is based on two phones replaced every two years at a cost of \$150 each, costing \$150 per year, or \$2.88 per week. The purchase of a computer is allowed for under the following section.

¹⁶ <https://www.glimp.co.nz/broadband/results>

The combined broadband and mobile phone costs come to **\$31.28** per week which is very close to the HES average of \$33.70 (see Appendix 1., Table 21).

Recreation and culture

The estimate for Recreation and culture expenditure is based on the HES results shown in Table 9 with a total of **\$92.12**. No needs-based estimate could be found.

Table 9. HES Recreation and culture

RECREATION AND CULTURE: 2016 HES CPI adjusted to June 2017. 2A+2C households. Income deciles 1-5.	Average weekly
	Reporting households
09.1 Audio-visual and computing equipment	15.38
09.2 Major recreational and cultural equipment	101.70
09.3 Other recreational equipment and supplies	30.92
09.4 Recreational and cultural services	47.37
09.5 Newspapers, books and stationery	13.30
09.6 Accommodation services	61.99
09 Total Recreation and culture	\$92.12

Education

Previously the HES database was used to estimate household education costs. However, New Zealand Council for Educational Research (NZCER) survey data and the Early Childhood Education (ECE) Survey of Income, Expenditure and Fees are both available. NZCER conducted a survey of New Zealand schools and parents in 2007 (Schagen & Wylie, 2009). The survey included questions about the costs of primary and secondary education that were met directly by parents through school donations, materials, activities, etc.

The primary and secondary education HES sub-category increased 51.8 percent between quarter 2 in 2007 and quarter 2 in 2017.¹⁷ Applying this increase to the weekly median and mean costs for 2007 gives inflation adjusted median and mean weekly costs for one primary school student of \$15 and \$21 respectively for 2017.

The median and mean¹⁸ annual costs for state schools for the year 2007 are shown in Table 10. The NZCER report recommends using the median rather than mean values due to high outliers which significantly skewed the mean upwards (Schagen & Wylie, 2009) p.170.

Table 10. State school costs from the NZCER survey for one primary school student

	Median	Mean
Primary school	500	731
Total costs for 2007	500	731
Weekly cost	10	14
CPI adjusted to 2017	15	21

¹⁷ <http://archive.stats.govt.nz/infoshare/ViewTable.aspx?pxID=2d1ed842-61d0-4af2-9951-3598665a69e9>

¹⁸ The report recommends using the median rather than mean values due to some very high outliers which significantly skewed the mean upwards (Schagen & Wylie, 2009) p.170.

Both median and mean estimates are higher than the \$10.49 reported by HES for primary to secondary education. In view of that the median estimate of \$15 from the NZCER survey seems adequate and is based on a reliable source.

Regarding ECE, the 2013 Survey of Income, Expenditure and Fees (SIEF) carried out by Early Childhood Education Services collected information on the costs, income, assets and liabilities, fees and voluntary work associated with early childhood education.¹⁹ They reported an average hourly fee of \$6.55 for hours beyond the weekly 20 free hours for the year 2013. In the absence of data for subsequent years the 2013 figure of \$6.55 has been inflation adjusted to June 2017 using CPI data for ECE fee movements since 2013. The overall increase over the period was 7.2 percent resulting in an inflation adjusted average estimated fee of \$7.02 for 2017.

With the living wage being between the ECE subsidy income threshold levels of \$47,800 and \$71,759.48, the household with two dependent children is eligible for an hourly subsidy of \$4.04²⁰ which reduces the \$7.02 per hour to \$2.98. The ten additional hours above the free twenty, outlined in the original report to allow for some flexibility in working hours, would therefore cost \$29.80 per week.

The weekly education cost is estimated at \$15 (primary school) + \$29.8 (ECE) = **\$44.80**.

The corresponding HES average education total was \$30.46 (see Appendix 1., Table 23).

Miscellaneous goods and services

This review is retaining the HES as the single source of information about this expenditure category. The average expenditure in this item category is **\$72.00** as Table 11 shows. No needs-based estimate could be found.

Table 11. HES Miscellaneous goods and services

MISCELLANEOUS GOODS AND SERVICES: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	Average weekly
	Reporting households
11.1 Personal care	23.00
11.3 Personal effects nec	28.06
11.4 Insurance	43.18
11.5 Credit services	2.58
11.6 Other miscellaneous services	13.07
11 Total Miscellaneous goods and services	\$72.00

Other expenditure

The revised estimate for Other expenditure is extracted from HES data (Table 12). It is adjusted to a proposed figure of **\$70.00** based on the similarly reduced 2013 estimate. The HES estimate is comprised mainly of interest payments, most of which are, in turn, are associated with home mortgages which do not apply to the target renting household. The

¹⁹ https://www.educationcounts.govt.nz/_data/assets/pdf_file/0011/169814/2013-Survey-of-Income-Expenditure-and-Fees-of-ece-Providers.pdf

²⁰ <https://www.workandincome.govt.nz/map/deskfile/extra-help-information/childcare-assistance-tables/childcare-subsidy-current.html>

\$70.00 is comprised of \$60 for exceptional emergencies based on the original focus groups' estimate, and an allowance of \$10.00 for non-mortgage interest payments.

Table 12. HES Other expenditure

OTHER EXPENDITURE: 2016 HES CPI adjusted to June 2017. 2A+2C households. Income deciles 1-5.	Average weekly
	Reporting households
13.1 Interest payments	105.60
13.2 Contributions to savings	34.10
13.3 Money given to others (excluding donations)	..
13.4 Fines	..
13 Total Other expenditure	\$102.41

The 2018 Living Wage

The 2018 Living Wage is calculated item by item as the foregoing section has demonstrated. A weekly total comprising the addition of the agreed estimates for each of the 12 items is prepared. This is a household total, not an individual total. The net weekly total is then multiplied to become an annual net total. The gross income required to receive the net amount is then calculated. This is a detailed calculation that takes into account the effects of income tax, tax credits (including the latest Families Package), childcare support and the accommodation supplement²¹. Finally, the hourly rate is derived by dividing the total gross household income by 52 (52 weeks in a year) and then dividing that result by 60 (representing 60 hours per week or one full time working parent and another halftime/20 hours per week working parent, i.e. 1.5 fulltime workers).

The results are set out in Table 13 and produce an hourly wage rate of \$20.53. Alongside each item is the information source or sources.

Table 13. 2018 itemised Living Wage Estimate

Expenditure items	Estimate \$	Information source
01 Food	212.00	Otago nutrition survey
03 Clothing and footwear	48.45	HES
04.1 Actual rentals for housing	332.00	MBIE rent bond database
04.5 Household energy	72.14	Fuel poverty study
05 Household contents and services	39.13	HES
06 Health	23.45	MoH, Pharmac & HES
07 Transport	131.56	Ministry of transport
08 Communication	31.28	Broadband and mobile phone providers
09 Recreation and culture	92.12	HES minus 09.2 major equipment
10 Education	44.80	NZCER primary and ECE survey
11 Miscellaneous goods and services	72.00	HES
13 Other expenditure	70.00	HES adjusted as per 2012
Weekly total	1,169	Apparent small disparities in totals are due to rounding.
Annual total net	60,784	
Annual total gross	64,059	
Hourly rate	\$ 20.53	

As in previous years, the final figure of \$20.53 is rounded to the nearest 5 or 10 cents mark to provide, in this case, a 2018 Living Wage figure of **\$20.55**.

The Living Wage produces a disposable household income that appropriately sits well below median household income and considerably above the poverty threshold at 60 percent of disposable household median income. The annual net total of \$60,784 amounts to 73 percent (72.62) of median disposable household income in New Zealand and 61 percent (61.09) of the mean disposable income for households with two adults and two children respectively (Perry 2017).

This estimate (\$20.55) is \$4.05 above the new (1 April 2018) minimum wage, or \$162 per week. The difference between the two wage settings is 24.5 percent of the minimum wage. Around a third of wage and salary earners in New Zealand are below the living wage rate. On this rate, a single earner working full-time would have a gross income of \$42,755.

²¹ As with the original 2013 report, this does not include the Accommodation Supplement because at that level of income the AS is not available – given the amount of rent used in these estimates.

This five-yearly review has involved in a full recalculation of the living wage that has resulted in an hourly wage rate of only 35 cents above the 2017 living wage. This is despite the not insubstantial rises in housing, energy and other costs in the more specific needs-based review calculations. It has been made possible by the increased generosity of the new Families Package which has supported an increase in disposable income for families with dependent children. The positive impact of the Families Package on lowering the expected level of the living wage for 2018 is quite apparent. If it was not forthcoming, then the hourly rate with the more precise calculations would be \$22.45 instead of \$20.55. The difference is almost \$2 an hour.

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Appendix 1.

The Household Economic Survey

The Household Economic Survey (HES) obtains expenditure data every three years from a national household sample of approximately 5,000. This report uses data from the 2016 HES which has been inflation adjusted to reflect 2017 expenditure levels.

The tables presented here contain expenditure averages for HES expenditure categories and sub-categories for households comprised of two adults and two dependent children, with household incomes within deciles 1 to 5 of the income distribution – or the bottom half of the income distribution. Averages are presented, separately, for all households – whether or not they have recorded spending on any particular item, and for only households which did record expenditure on any particular item. These tables only differ from those presented in the body of this report by showing the confidence intervals and flags.

The HES data is provided with upper and lower 95% confidence levels and flags indicating the extent of sampling error for each sub-category and category. The flags are:

- (no flag) relative sampling error of 21 to below 50 percent
- ** relative sampling error of 50 to below 100 percent
- *** relative sampling error of 100 percent or more
- .., 'S' Suppressed: too few households report expenditure

The confidence levels and sampling error flags can be useful in some cases when comparing estimates based on alternative sources with those based on the HES by showing whether the alternative estimate is within the upper and lower confidence levels.

As noted earlier, The HES tables used in this review are based on the averages of the expenditures of those households that actually reported having spent money on them. This means that the averages for separate sub-categories and categories are usually based on different denominators and the sub-category averages therefore rarely sum to the same value as the category total average.

Table 14 HES Food

FOOD: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
01.1 Fruit and vegetables	28.83	23.17	34.49	
01.2 Meat, poultry and fish	35.21	23.97	46.44	*
01.3 Grocery food	105.45	87.94	122.96	
01.4 Non-alcoholic beverages	13.83	10.57	17.09	*
01.5 Restaurant meals and ready-to-eat food	59.67	43.96	75.38	*
01 Total Food	225.11	190.33	259.90	

Table 15 HES Clothing and footwear

CLOTHING AND FOOTWEAR: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
03.1 Clothing	43.36	30.27	56.44	*
03.2 Footwear	24.26	10.25	38.27	**
03 Total Clothing and footwear	48.45	26.53	52.55	*

Table 16 HES Rents

ACTUAL RENTALS FOR HOUSING: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
04.1 Total Actual rentals for housing	327.03	260.46	393.60	*

Table 17 HES Household energy

HOUSEHOLD ENERGY: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
04.5 Total Household energy	62.30	51.61	72.99	

Table 18 HES Household contents and services

HOUSEHOLD CONTENTS AND SERVICES: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
05.1 Furniture, furnishings and floor coverings	23.32	14.23	32.41	*
05.2 Household textiles	7.37	1.82	12.93	**
05.3 Household appliances	21.33	13.45	29.32	*
05.5 Tools and equipment for house and garden	10.13	6.28	13.88	*
05.6 Other household supplies and services	14.99	5.59	24.38	**
05 Total Household contents and services	39.13	25.55	52.82	*

Table 19 HES Health

HEALTH: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
06.1 Medical products, appliances and equipment	13.65	7.99	19.21	*
06.2 Out-patient services	52.74	24.51	81.06	**
06 Total Health	34.13	18.20	49.96	*

Table 20 HES Transport

TRANSPORT: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
07.1 Purchase of vehicles	140.74	102.01	179.48	*
07.2 Private transport supplies and services	63.68	48.67	78.69	*
07.3 Passenger transport services	62.21	11.56	112.86	**
07 Total Transport	131.56	106.16	156.86	

Table 21 HES Communication

COMMUNICATION: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
08.1 Postal services	9.95	-1.26	21.15	***
08.2 Telecommunication equipment	26.74	0.76	52.72	**
08.3 Telecommunication services	31.46	27.03	35.88	
08 Total Communication	33.68	28.72	38.54	

Table 22 HES Recreation and culture

RECREATION AND CULTURE: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
09.1 Audio-visual and computing equipment	15.38	9.28	21.48	*
09.2 Major recreational and cultural equipment	101.70	-79.43	282.73	***
09.3 Other recreational equipment and supplies	30.92	14.77	47.07	**
09.4 Recreational and cultural services	47.37	18.89	75.96	**
09.5 Newspapers, books and stationery	13.30	5.32	21.28	**
09.6 Accommodation services	61.99	32.96	91.02	*
09 Total Recreation and culture	92.12	46.11	138.12	*

Table 23 HES Education

EDUCATION: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
10.1 Early childhood education	46.23	5.49	86.87	**
10.2 Primary, intermediate and secondary education	10.49	4.42	16.55	**
10.3 Tertiary and other post school education	..	..	..	S
10.4 Other educational fees	9.35	-0.94	19.53	***
10 Total Education	30.46	11.86	49.06	**

Table 24 HES Miscellaneous goods and services

MISCELLANEOUS GOODS AND SERVICES: 2016 HES CPI adjusted to June 2017. Income deciles 1- 5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
11.1 Personal care	23.00	17.01	29.10	*
11.3 Personal effects nec	28.06	15.77	40.36	*
11.4 Insurance	43.18	33.93	52.43	*
11.5 Credit services	2.58	1.81	3.43	*
11.6 Other miscellaneous services	13.07	2.34	23.81	**
11 Total Miscellaneous goods and services	72.00	59.49	84.51	

Table 25 HES Other expenditure

OTHER EXPENDITURE: 2016 HES CPI adjusted to June 2017. Income deciles 1-5.	2A+2C households reporting spending			
	Average weekly	Lower confidence interval	Upper confidence interval	Flag
13.1 Interest payments	105.60	65.50	145.80	*
13.2 Contributions to savings	34.10	27.40	40.90	
13.3 Money given to others (excluding donations)	..	..	..	S
13.4 Fines	..	..	..	S
13 Total Other expenditure	102.41	71.60	133.23	*

Appendix 2.

Estimated Food Costs information

Food cost information is published annually by the University of Otago Department of Human Nutrition (Dept. of Human Nutrition, 2017).²² Three sets of estimates are produced to represent the costs of meeting basic, moderate and liberal diets for each of the following categories:

- One man
- One woman
- One adolescent boy
- One adolescent girl
- One 10 year old child
- One 5 year old child
- One 4 year old child
- One 1 year old child

Separate regional estimates are produced for

- Auckland
- Wellington
- Christchurch
- Dunedin

In 2014 the food items included were updated to reflect current consumer food choices, based on data from the most recent national nutrition survey (University of Otago, 2011). “The main changes were removal of some cuts of meat and inclusion of some convenience foods such as tomato-based pasta sauce and packaged biscuits” (Dept. of Human Nutrition, 2017). Until the 2016 survey there were five regions, but from 2016 Hamilton will not be included.

The differences between the three levels of diet are explained in the following extract from the Department’s information package which explains how the estimates are produced.

Calculation of food costs

The calculation of the Basic diet costs for each centre is completed as follows:

1. *Prices and weights for each food item are entered into an Excel spreadsheet and the cost per gram or kg is calculated.*
2. *For each food category a weighted average of \$ per gram or kilogram is calculated.*

Since 2014 we have used a weighted average (a simple average was used in previous years) to take into consideration the popularity of individual food items within each food category. For example, for the fruit category we know that bananas are more commonly consumed than strawberries. The use of a weighted average allows the average price for the fruit category to reflect this.

3. *The weighted average of \$ per gram or kg is multiplied by the weekly amounts of each food category allocated for each sex and age group (Table 1).*

²² <http://hdl.handle.net/10523/6659>

4. The cost of the food categories are summed to give the total cost of a Basic diet for each age and sex group.

The Moderate cost category allows for an increase in the variety of meats, fish, fruits and vegetables and the inclusion of some convenience foods. This category is calculated from the Basic cost by adding 30% to the Basic diet cost figure.

The Liberal cost category allows for the use of more convenience and imported foods, out of season fruits and vegetables, higher priced cuts of meat and some specialty foods. This is calculated by adding 20% to the Moderate diet cost figure. (Dept. of Human Nutrition, 2017)

The various combinations of two adults and two children, based on children's pre-school and primary school ages, are shown in Table 26 along with mean and median values. The mean national figure of **\$212** is used in this report.

Table 26. Food cost estimates for various household compositions

	Basic \$	Moderate \$	Liberal \$
2A+Adolescent boy + 4 year old	227	296	355
2A+Adolescent girl + 4 year old	215	279	335
2A+10 year old + 4 year old	206	268	322
2A+5 year old + 4 year old	199	258	310
Mean	212	275	330

The food cost estimates for each type of person, for each of the three cost levels for each of the four main centres and national averages on which Table 26 is based are shown in Table 27

Table 27. Food cost estimates by city, gender and age

Food cost estimates for 2017	Basic \$	Moderate \$	Liberal \$
Auckland			
Man	65	85	102
Woman	55	72	86
Adolescent Boy	68	89	107
Adolescent Girl	56	73	87
10 year old	48	62	75
5 year old	41	53	64
4 year old	32	41	49
1 year old	28	36	43
Wellington			
Man	69	89	107
Woman	58	76	91
Adolescent Boy	72	94	113
Adolescent Girl	59	77	92
10 year old	51	66	79
5 year old	43	56	67
4 year old	33	43	52
1 year old	28	37	44
Christchurch			
Man	68	88	106
Woman	58	75	90
Adolescent Boy	71	93	111
Adolescent Girl	59	76	91
10 year old	50	65	78
5 year old	43	55	66
4 year old	33	43	52
1 year old	29	37	45
Dunedin			
Man	67	87	105
Woman	57	74	88
Adolescent Boy	70	91	110
Adolescent Girl	57	74	89
10 year old	49	64	77
5 year old	42	54	65
4 year old	32	42	51
1 year old	28	37	44
National Average			
Man	67	87	105
Woman	57	74	89
Adolescent Boy	70	92	110
Adolescent Girl	58	75	90
10 year old	50	64	77
5 year old	42	55	66
4 year old	33	42	51
1 year old	28	37	44

Appendix 3.

The Tenancy rent bond database

Market rents information

This information is available from the Tenancy Bond Database maintained by the Ministry of Business, Innovation and Employment.²³ The database reports average rents at the top of each rent quartile. This report, as with the original calculation, uses national average rent figures for three bedroom houses at the top of the first rent quartile.

The three bedroom house is highlighted because this is the most appropriate minimum number of bedrooms necessary for the target household to avoid crowding. There are several measures of household crowding in use and the one most commonly used in New Zealand (by Statistics New Zealand) is the Canadian crowding measure which is one of a number of such measures that are based on comparing numbers of people living in a house with numbers of bedrooms.

Under such measures, a household is classified as crowded if it does not have enough bedrooms for its occupants based upon set criteria for the sharing of bedrooms. Measures of this type are distinguished from one another primarily by differences between their bedroom sharing criteria, but what is common among the measures is that decisions about acceptable and unacceptable bedroom sharing are based upon combinations of age, gender, and relationship status.

The Canadian crowding measure is based on the Canadian National Occupancy Standard which specifies the following:

1. there should be no more than two people per bedroom
2. parents or couples share a bedroom
3. children under five years, either of the same or of the opposite sex, may reasonably share a bedroom
4. children under 18 years of the same sex may reasonably share a bedroom
5. a child aged 5-17 years should not share a bedroom with one under five of the opposite sex
6. single adults 18 years and over and any unpaired children require a separate bedroom

It follows that children aged from five to 17 years should not share a bedroom with one of the opposite sex from the same age group – in addition to not sharing with a child of the opposite sex aged below five, as stated in specification 5, above. A search of references to the Canadian National Occupancy Standard has not yielded any more information about this. However the following passage in *NZ Housing Now* from Statistics NZ indicates that NZ official crowding statistics reflect an understanding that those aged five to 17 should not share a room with a member of the opposite sex from the same age group.

“While the British standard permits two children under 10 years to share a bedroom, irrespective of gender, in the Canadian model the equivalent age is under five. The age at which young adults should have their own room is also lower – 18 years compared with 21 in the United Kingdom.”²⁴

According to these criteria, two bedrooms would be sufficient for our target household if the two children were of the same sex and no older than 17. In many cases, however, the two

²³ <http://www.mbie.govt.nz/info-services/housing-property/sector-information-and-statistics/rental-bond-data>

²⁴ Statistics New Zealand (2008) *New Zealand Now: Housing*. Wellington: Statistics New Zealand.

children will be of opposite sexes and at least one of them older than five. In view of this, it is prudent to specify three bedrooms for the purposes of this Living Wage research because this size will meet the requirements of most target households and accord equal treatment to all pairs of children, regardless of their sex. This is also consistent with another measure that has been used in New Zealand: The Equivalised Crowding Index²⁵ which applies the concept of the adult individual's need for a separate bedroom. The formula weights each individual who is in a couple relationship as one half, as well as children aged under 10 years (Morrison, 1994). This gives an equivalised number of people per bedroom. Any value in excess of 1.0 represents a measure of crowding. The formula is:

- Equivalised Crowding Index = [(1/2 number of children under 10 years) + (number of couples) + (all other people aged 10 years and over)] / number of bedrooms

Using this measure, two children of either sex will need separate bedrooms if at least one of them is aged 10 years or over.

²⁵ http://www.stats.govt.nz/tools_and_services/tools/TableBuilder/housing-quality-tables/crowding-occupancy-rate.aspx

Appendix 4.

Inland Revenue Department income tax rates information

For the purposes of determining the contribution of income tax on calculating the level of gross income required to produce a given level of net income it is necessary to be able to calculate a net amount from a given gross amount.

Calculations of tax payable on gross income are based on the tax rates in effect during the current tax year 1 April 2018 to 31 March 2019 shown in Table 28. Income tax calculations are based on the PAYE rates in the third column of Table 28 which shows the total deduction after the addition of the ACC Earners' levy to the PAYE. The ACC Earners' levy is currently set at 1.39 percent and applied equally to all annual income levels up to \$126,286, beyond which no further ACC Earners' levy is payable.

Table 28. PAYE rates for the year 1 April 2018 31 March 2019

Taxable income	Income tax rates in cents for every \$1 of taxable income (excluding ACC earners' levy)	PAYE rates in cents for every \$1 of taxable income (including ACC earners' levy of 1.39%)
up to \$14,000	10.50	11.89
from \$14,001 to \$48,000	17.50	18.89
from \$48,001 to \$70,000	30.00	31.39
From \$70,001 to \$126,286	33.00	34.39
Above \$126,286	33.00	33.00

In order to simplify the process of calculating net and gross values with different income values and PAYE rates four sets of conversion formulas have been derived, and these are defined in the following section. These formulae are incorporated in the Stata coding detailed in Appendix 7.

Tax calculation formulae

Five sets of formulae were derived, one for each of the income brackets listed in Table 28. In the formulas, gross and net incomes are indicated, respectively, by the letters G and N. Formulas are shown for converting gross income to net and for converting net to gross. The formulas (shown in **bold italic** type) were derived as shown below.²⁶ In the first line of the working for deriving each formula, each sub-bracket contains the dollar amount covered by one tax bracket shown in Table 28, column 1 and the associated tax plus ACC rate shown in column 3 of Table 28. A further explanation of the content of the first line of each set of equations is provided at the end, using the first set as an example.

It must be emphasised that each formula is only valid for the income range to which it applies. In other words, the value of G in any particular case must be less than the value of the lowest income covered by the next highest tax bracket – except that there is no upper limit for income covered by the highest PAYE rate (i.e., for incomes over \$126,286).

²⁶ Standard algebraic bracket expansion operations are used.

1. If Gross income >\$126,286

$$\begin{aligned}N &= G - [(G - 126286)*0.33 + (56286*0.3439)+(22000*0.3139)+(34000*0.1889)+(14000*0.1189)] \\ &= G - [(G - 126286)*0.33+34349.7554] \\ &= G - [(G - 126286)*0.33] - 34349.7554 \\ &= G - 0.33G + 41674.38 - 34349.7554\end{aligned}$$

So

$$N = 0.67G + 7324.6246$$

2. If Gross income is \$70,001-\$126,286

$$\begin{aligned}N &= G - [(G-70000)*0.3439 + (22000*0.3139) + (34000*0.1889) + (14000*0.1189)] \\ &= G - [(G - 70000)*0.3439 + 14993] \\ &= G - [(G - 70000)*0.3439] - 14993 \\ &= G - 0.3439G + 24073 - 14993\end{aligned}$$

So

$$N = 0.6561G + 9080$$

3. If Gross income is in the range: \$48,001-\$70,000

$$\begin{aligned}N &= G - [(G - 48000)*0.3139 + (34000*0.1889) + (14000*0.1189)] \\ &= G - [(G-48000)*0.3139 + 8087.2] \\ &= G - [(G - 48000)*0.3139] - 8087.2 \\ &= G - 0.3139G + 15067.2 - 8087.2\end{aligned}$$

So

$$N = 0.6861G + 6980$$

4. If Gross income is in the range: \$14,001-\$48,000

$$\begin{aligned}N &= G - [(G - 14000)*0.1889 + (14000*0.1189)] \\ &= G - [(G - 14000)*0.1889 + 1664.6] \\ &= G - [(G - 14000)*0.1889] - 1664.6 \\ &= G - 0.1889G + 2644.6 - 1664.6\end{aligned}$$

So

$$N = 0.8111G + 980$$

5. If Gross income is in the range: \$0 - \$14,000

$$N = G - (G*0.1189)$$

so

$$N = 0.8811G$$

A further explanation of equation content

Using the first line of set 1, above, as an example, the term $(G - 126,286)$ represents the result of subtracting the threshold value of \$126,286 from the value of the total income received (when that income is greater than \$126,286). The resulting income over the threshold of \$126,286 is taxed at 33.0 percent with no ACC earner's levy payable above this threshold.

The second term, $(56286*0.3439)$ represents the tax on the \$56,286 of income between \$126,286 and \$70,000 ($\$126,286 - \$70,000 = \$56,286$) that is taxed at 34.39 percent (or 0.3439), including the ACC earners' levy.

The third term, $(22000 \cdot 0.3139)$ represents the tax on the \$22,000 of income between \$48,000 and \$70,000 ($\$70,000 - \$48,000 = \$22,000$) that is taxed at 31.39 percent (or 0.3139), including the ACC earners' levy.

The fourth term, $(34000 \cdot 0.1889)$ represents the tax on the \$34,000 of income between \$14,000 and \$48,000 ($\$48,000 - \$14,000 = \$34,000$) that is taxed at 18.89 percent (or 0.1889), including the ACC earners' levy.

The fifth and final term, $(14000 \cdot 0.1189)$ represents the tax on the first \$14,000 of income that is taxed at 11.89 percent (or 0.1189), including the ACC earners' levy.

The subsequent lines in each set of equations document the steps by which the final, simplified, conversion formulae were derived.

Appendix 5.

Work and Income Accommodation Supplement information

The Accommodation Supplement is a weekly payment which helps people with their rent, board or the cost of owning a home, if their income from other sources is below a certain income threshold level and their housing cost is above a certain rent or mortgage payment cost level. The amount of Accommodation Supplement payable ranges between a specified maximum and reduces towards zero as income increases from the threshold level to a specified cut point. Income and housing cost thresholds, cut points, and maximums vary for different categories of household, and each of the four areas of New Zealand. The area based variations reflect differences in housing costs across the country, with Area 1 comprised of the most expensive housing areas, and Area 4 the least expensive and comprised of all areas not included in any of the first three.

This Living Wage related work uses the income and housing cost thresholds, cut points and maximums specified for non-beneficiary households of married, civil union or de facto couples with children, for each of the four areas (see Figure 2). The thresholds and cut-out points are those in effect from 1 April 2017, the maximum rates are those published in the Families Package Factsheet.²⁷

Figure 2. Accommodation Supplement income cut-out points and entry thresholds and maximum payments for non-beneficiary couple with children households²⁸

Married, civil union or de facto couple, 1+ children	Income threshold		Cut-out point		Entry threshold for rent		Maximum rate for AS per week
	Per week	Per year	Per week	Per year	Per week	Per year	
Area 1	\$622	\$32,344	\$1,522	\$79,144	\$118	\$6,136	\$305
Area 2	\$622	\$32,344	\$1,282	\$66,664	\$118	\$6,136	\$220
Area 3	\$622	\$32,344	\$1,102	\$57,304	\$118	\$6,136	\$160
Area 4	\$622	\$32,344	\$922	\$47,944	\$118	\$6,136	\$120

The calculation of the level of supplement (if any) available to a household is carried out according to the following formula:

Accommodation Supplement formula (Non-beneficiaries)

Where:

AS = Accommodation Supplement

R = Rent

Rt = Rent threshold (Non-beneficiary)

Yg = Gross income

Yt = Income threshold

AND subject to relevant threshold, cut out point and maximum values.

$$AS = [(R - Rt) * 0.7] - [(Yg - Yt) * 0.25]$$

²⁷ <https://www.beehive.govt.nz/sites/default/files/2017-12/Families%20Package%20Factsheet.pdf>

²⁸ <https://www.workandincome.govt.nz/map/deskfile/extra-help-information/accommodation-supplement-tables/non-beneficiaries-current-01.html> and <https://www.workandincome.govt.nz/map/deskfile/extra-help-information/accommodation-supplement-tables/income-cut-out-points-for-non-beneficiaries-curren.html>

Appendix 6.

Working for Families family and in-work tax credits

Working for Families weekly payments (1 Jul 2018 to 31 March 2019)				
Family Income (before tax) Annual \$		Entitlements for two children		
From	To	FTC \$	IWTC \$	Total TCs \$
0	42,700	10608	3744	14352
42,701	44,000	10296	3744	14040
44,001	45,500	9880	3744	13624
45,501	47,000	9516	3744	13260
47,001	48,500	9152	3744	12896
48,501	50,000	8788	3744	12532
50,001	51,500	8372	3744	12116
51,501	53,000	8008	3744	11752
53,001	54,500	7644	3744	11388
54,501	56,000	7280	3744	11024
56,001	57,500	6916	3744	10660
57,501	59,000	6500	3744	10244
59,001	60,500	6136	3744	9880
60,501	62,000	5772	3744	9516
62,001	63,500	5408	3744	9152
63,501	65,000	5044	3744	8788
65,001	66,500	4628	3744	8372
66,501	68,000	4264	3744	8008
68,001	69,500	3900	3744	7644
69,501	71,000	3536	3744	7280
71,001	72,500	3172	3744	6916
72,501	74,000	2756	3744	6500
74,001	75,500	2392	3744	6136
75,501	77,000	2028	3744	5772
77,001	78,500	1664	3744	5408
78,501	80,000	1248	3744	4992
80,001	81,500	884	3744	4628
81,501	83,000	520	3744	4264
83,001	84,500	156	3744	3900
84,501	86,000	0	68	68
86,001	87,500	0	61	61
87,501	89,000	0	54	54
89,001	90,500	0	46	46
90,501	92,000	0	39	39
92,001	93,500	0	32	32
93,501	95,000	0	25	25
95,001	96,500	0	18	18
96,501	98,000	0	10	10
98,001	99,500	0	3	3
99,501 and above		0	0	0

Appendix 7.

Stata15²⁹ code for calculating gross and net income equivalence

This code generates a dataset/spreadsheet with a range of gross income values in one dollar increments, and associated values for:

- KiwiSaver
- Working for Families including in work tax credit
- Gross income for full-time worker
- Gross income for half-time worker
- Net income for full-time worker
- Net income for half-time worker
- Total household net income less KiwiSaver
- Total disposable income including Working for Families
- Hourly rate for fulltime earner based on gross income
- Rent amount for specified house
- Accommodation Supplement value
- Disposable income including accommodation supplement

The range of gross incomes is set to encompass the range of values within which the living wage is likely to fall. The code presented below is set to generate a range of incomes from 30,000 to 100,000, which is much wider than necessary for the purpose of this review, but useful for verifying the accuracy of results over a wide range of incomes. The range can be reduced if preferred.

The dataset is used identify the gross household income and hourly wage rate associated with any particular level of household disposable income.

The Working for Families and in work tax credit calculation is based on a table of values provided by IRD (an IR271 form) covering the period 1 July 2018 to 31 March 2019, and for all subsequent years until it is changed. The table reports the income brackets and associated WFF and IWTC entitlements at full implementation after 1 July 2018, based on the legislation as specified in the Families Package (Income Tax and Benefits) Bill. The income brackets and associated entitlements are listed in Appendix 6.

The basis for tax coding is detailed in Appendix 4.

The basis for Accommodation Supplement coding is detailed in Appendix 5.

Text that is preceded by ** explains the purpose of the code that follows it

Code:

```
**Generate gross income range in $1 increments from 30,000 to 100,000.
```

```
set obs 70001
```

```
range gross 30000 100000 70001
```

```
**calculates kiwisaver of 3%
```

```
gen kiwi = gross * 0.03
```

```
**calculates value of wff/families package including In Work Tax Credits
```

```
**using Families Package full entitlement rate material from IRD (Appendix 5.)
```

```
generate wff = 0
```

```
replace wff = 14352 if gross <=42700
```

²⁹ (StataCorp, 2017)

```

replace wff = 14040 if gross >=42701 & gross <=44000
replace wff = 13624 if gross >=44001 & gross <=45500
replace wff = 13260 if gross >=45501 & gross <=47000
replace wff = 12896 if gross >=47001 & gross <=48500
replace wff = 12532 if gross >=48501 & gross <=50000
replace wff = 12116 if gross >=50001 & gross <=51500
replace wff = 11752 if gross >=51501 & gross <=53000
replace wff = 11388 if gross >=53001 & gross <=54500
replace wff = 11024 if gross >=54501 & gross <=56000
replace wff = 10660 if gross >=56001 & gross <=57500
replace wff = 10244 if gross >=57501 & gross <=59000
replace wff = 9880 if gross >=59001 & gross <=60500
replace wff = 9516 if gross >=60501 & gross <=62000
replace wff = 9152 if gross >=62001 & gross <=63500
replace wff = 8788 if gross >=63501 & gross <=65000
replace wff = 8372 if gross >=65001 & gross <=66500
replace wff = 8008 if gross >=66501 & gross <=68000
replace wff = 7644 if gross >=68001 & gross <=69500
replace wff = 7280 if gross >=69501 & gross <=71000
replace wff = 6916 if gross >=71001 & gross <=72500
replace wff = 6500 if gross >=72501 & gross <=74000
replace wff = 6136 if gross >=74001 & gross <=75500
replace wff = 5772 if gross >=75501 & gross <=77000
replace wff = 5408 if gross >=77001 & gross <=78500
replace wff = 4992 if gross >=78501 & gross <=80000
replace wff = 4628 if gross >=80001 & gross <=81500
replace wff = 4264 if gross >=81501 & gross <=83000
replace wff = 3900 if gross >=83001 & gross <=84500
replace wff = 68 if gross >=84501 & gross <=86000
replace wff = 61 if gross >=86001 & gross <=87500
replace wff = 54 if gross >=87501 & gross <=89000
replace wff = 46 if gross >=89001 & gross <=90500
replace wff = 39 if gross >=90501 & gross <=92000
replace wff = 32 if gross >=92001 & gross <=93500
replace wff = 25 if gross >=93501 & gross <=95000
replace wff = 18 if gross >=95001 & gross <=96500
replace wff = 10 if gross >=96501 & gross <=98000
replace wff = 3 if gross >=98001 & gross <=99500
replace wff = 0 if gross >=99501

```

**calculates gross income for fulltime earner

```

generate ftgross = 0
replace ftgross = gross * 2/3

```

**calculates gross income for halftime earner

```

generate htgross = 0
replace htgross = gross * 1/3

```

**calculates fulltime earner's net income (Appendix 4.)

```

generate ftnet = 0
replace ftnet = ftgross * 0.8811 if ftgross <=14000
replace ftnet = ftgross * 0.8111 + 980 if ftgross >14000 & ftgross <=48000
replace ftnet = ftgross * 0.6861 + 6980 if ftgross>48000 & ftgross <=70000

```

```
replace ftnet = ftgross * 0.6561 + 9080 if ftgross >70000 & ftgross <=126286
replace ftnet = ftgross * 0.67 + 7324.6246 if ftgross >126286
```

```
**calculates halftime earner's net income
```

```
generate htnet = 0
```

```
replace htnet = htgross * 0.8811 if htgross <=14000
```

```
replace htnet = htgross * 0.8111 + 980 if htgross >14000 & htgross <=48000
```

```
replace htnet = htgross * 0.6861 + 6980 if htgross >48000 & htgross <=70000
```

```
replace htnet = htgross * 0.6561 + 9080 if htgross >70000 & htgross <=126286
```

```
replace htnet = htgross * 0.67 + 7324.6246 if htgross >126286
```

```
**calculates total net income less kiwisaver
```

```
generate totnet = ftnet + htnet - kiwi
```

```
**calculates total disposable income incl working for families wff
```

```
generate totnetinclwff = totnet + wff
```

```
**calculates hourly rate for fulltime earner based on gross income
```

```
generate hourly = gross / 52 / 60
```

```
**rent amount for specified house (annual rent based on weekly estimate of $332)
```

```
gen rent = 17264
```

```
**calculates accommodation supplement value for each of the four areas (Appendix 5.)
```

```
generate as1 = ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) if ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) > 0 & (gross < 79144)
```

```
recode as1 (missing = 0)
```

```
generate as2 = ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) if ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) > 0 & (gross < 66664)
```

```
recode as2 (missing = 0)
```

```
generate as3 = ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) if ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) > 0 & (gross < 57304)
```

```
recode as3 (missing = 0)
```

```
generate as4 = ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) if ((rent - 6136) * 0.7) - ((gross - 32344) * 0.25) > 0 & (gross < 47944)
```

```
recode as4 (missing = 0)
```

```
**calculates net income including accommodation supplement
```

```
generate netas1 = totnetinclwff + as1
```

```
generate netas2 = totnetinclwff + as2
```

```
generate netas3 = totnetinclwff + as3
```

```
generate netas4 = totnetinclwff + as4
```