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Fiscal incidence and income inequality by age: Results for New Zealand in tax year 2018/19

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Supplementary material supporting this report can be accessed at the following GitHub address: https://github.com/Treasury-Analytics-and-Insights/analytical-note-24-09-fiscal-incidence-and-inequality-by-age

Executive summary

In this analytical note we report results of a calculation of the final incomes of individuals in New Zealand in tax year 2018/19. An individual's final income, like their disposable income, adds any income support payments they receive to their market income (from their wage or salary and investments), while accounting for the direct taxes they pay. However, final incomes go beyond this by incorporating both the value of government spending on social services that individuals receive and the indirect taxes they pay on their consumption. The final income concept thus offers a more comprehensive picture of an individual's income and living standards than is provided by analyses of their market or disposable income alone.

We apply a sharing rule to account for the distribution of disposable incomes and indirect taxes such as goods and services tax (GST) within families and households. Combining these shared incomes and taxes with estimates of in-kind spending on education and health services that individuals receive yields their final incomes.

We present results for the average market, disposable, and final incomes of individuals in five-year age groups and quantify the inequality of the distribution of each of these income types in each group by their Gini coefficients. Our analysis also covers the various tax and spending components that contribute to final incomes, and the net fiscal impacts of these components, across the age range. We further consider the distributions of the three income concepts over age groups in four distinct family types. These estimates provide a characterisation of the effects of fiscal policies on the incomes of individuals across the course of their lives.

We find the following key results:

- Income support payments, taxes, and in-kind social services spending result in a profile of final income across an individual's lifetime that is much flatter than that of their market income. The contributions of indirect taxes and in-kind spending have the largest effects on the final incomes of the youngest and oldest individuals in the population, due primarily to spending on education services, and on health services and New Zealand Superannuation payments, respectively.
- The average net fiscal impact on individuals is positive for children and youth, and for individuals at or past the age of eligibility for New Zealand Superannuation. Throughout the primary working years, this average impact is negative, as individuals pay more in taxes than they receive in income support payments and social services.
- Final income inequality among older individuals is substantially reduced by income support payments, taxes, and in-kind health spending. The inequality of market incomes increases markedly with age in the senior years, but this trend is reversed when disposable and final incomes are considered. In the prime working age range, disposable income inequality gradually increases with age, and final income inequality follows this trend at a slightly lower level.

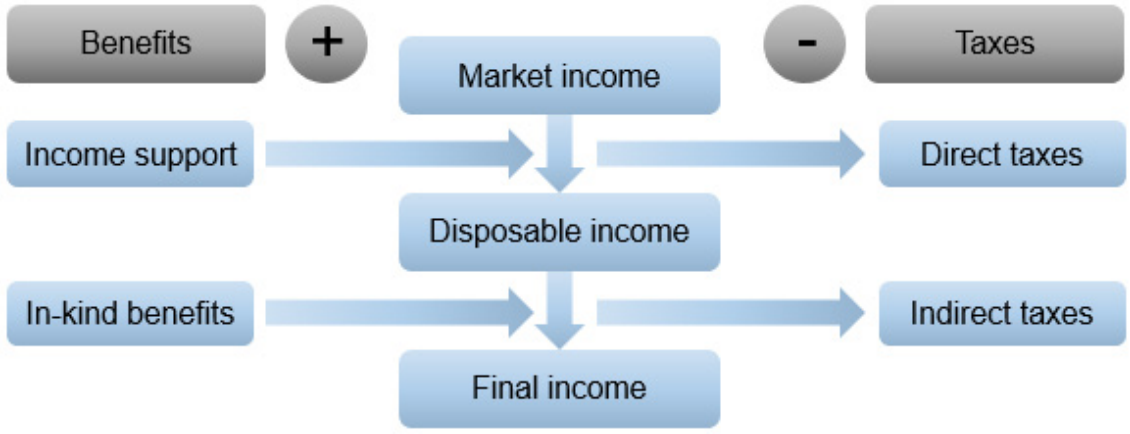
Introduction

The incomes that individuals derive from market sources, the income support payments they receive, and the taxes they pay, all vary appreciably over the course of their lives. The social services provided to individuals by the government also have a strong age-dependent incidence. Education services are primarily focussed on youth, while a significant share of health system resources is allocated to providing services for older persons, in addition to the cash transfers they receive in the form of superannuation payments. As the New Zealand population is expected to age substantially over the coming decades, the incidence of taxes, income support payments, and social services across age groups is of considerable relevance to future fiscal policy (The Treasury, 2021; Bell, 2021).

Fiscal incidence studies provide an approach to examining how government taxation and social policies affect the income distribution, by extending the usual examination of the disposable incomes of individuals or households to analyse their final incomes. Final incomes are obtained from disposable incomes by subtracting the "indirect" taxes individuals and households pay on their consumption expenditure and adding estimates of the cash values of the in-kind benefits (sometimes referred to as in-kind social services, social transfers in kind, or non-cash benefits) they receive. Figure 1 illustrates how the market, disposable, and final income concepts are related.[1] In this analytical note we extend our analysis of household fiscal incidence in New Zealand in the 2018/19 tax year (Wright and Nguyen, 2024) to investigate how individuals' final incomes and their components vary with their ages.

[1] The relationships between the income concepts in Figure 1 and levels of material inequality and wellbeing have been discussed, eg, by Hughes (2022) (see also The Treasury, 2022).

Figure 1: Illustration of income concepts



We calculate market incomes, income support payments, direct taxes, and disposable incomes using the Treasury's Tax and Welfare Analysis (TAWA) model (The Treasury, 2024), with inputs taken from the 2018/19 Household Economic Survey (HES) and administrative income, tax, and transfer data in Stats NZ's Integrated Data Infrastructure (IDI) environment. As our analysis is based on a single survey cross-section, it does not control for cohort effects. Accounting for such effects would require, eg, the analysis of multiple years of cross-sectional surveys (see, eg, Deaton and Paxson, 1994). Nevertheless, our analysis provides a detailed snapshot of fiscal incidence across different age groups at a specific point in time.

We derive estimates of indirect taxes from household-level expenditure responses in HES and household consumption statistics from the National Accounts. In-kind spending on education services received by children and students in our analysis is based on their reported enrolment in educational institutions in HES. We distribute in-kind health spending amounts over all individuals in HES in proportions determined by the Ministry of Health's Population-Based Funding Formula model (Ministry of Health, 2016), which assigns expected healthcare costs to a person based on their demographic characteristics. Further details of our fiscal incidence methodology, including a discussion of the taxation and government expenditure categories not included in our analysis, are given in Wright and Nguyen (2024).

We follow Aziz *et al.* (2013a, 2013b, 2014, 2016) in deriving final incomes for individuals in an approach that aims to account for the sharing of disposable incomes within families (cf. Phipps and Burton, 1995). In our analysis, we consider sharing within economic family units in the TAWA/HES sample, which are hereafter referred to as "TAWA families" or simply "families". The identification of distinct TAWA families within a household utilises a definition of dependent children that aligns with the Working for Families (WfF) legislation. We illustrate the grouping of the members of an example household into TAWA families in Figure 2.

We distribute disposable income amounts among members of a TAWA family in proportions corresponding to the modified OECD (mOECD) equivalence scale (Hagenaars *et al.*, 1994)

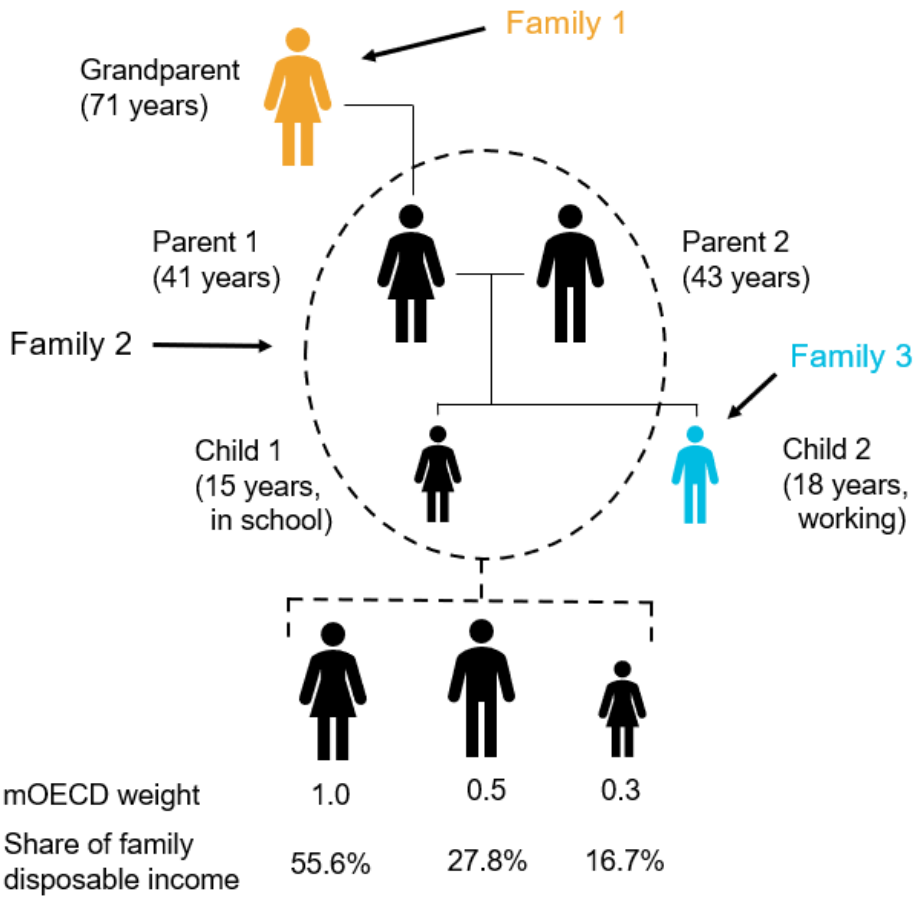
$$E = 1 + 0.5\,(A - 1) + 0.3\,C. \qquad (1)$$

This scale is commonly used to equivalise household incomes, to enable comparisons of living standards between households of different sizes and compositions. In our application of it to intra-family sharing, A and C are the numbers of adults (those individuals who are not dependent children) and dependent children in a family, respectively. We distribute the total

disposable income of each family among its members in proportion to the coefficients in Equation (1); ie, we assign the principal earner in each family a relative weight of 1, their partner, if present, a weight of 0.5, and each dependent child a weight of 0.3.

In Figure 2 we show the shares of the total disposable income of a family in our example household that the intra-family sharing rule attributes to each family member. We apply a similar rule to share indirect taxes, which we obtain at the household level in our approach to estimating fiscal incidence, over individuals. To obtain the final incomes of individuals, we subtract these indirect taxes from their disposable incomes and add estimates of the in-kind spending on health and education services that they receive.

Figure 2: Intra-family sharing in an example household



In this note we present the average market, disposable, and final incomes of individuals, and the net fiscal impact upon them, for a range of five-year age groups. We also estimate the income inequality, as quantified by the Gini coefficient, experienced by individuals in each age group, under each of the three different income definitions. We further compare the distributions of these incomes over age groups between four different family types (single and coupled adults, both with and without dependent children).

In the Annex, we provide further details of our methodological approach, additional family composition, labour force participation, and benefit receipt estimates that assist in the interpretation of our results, and investigations of the sensitivity of our findings to the form of the income-sharing assumption.

Age-group distribution of final income and its components

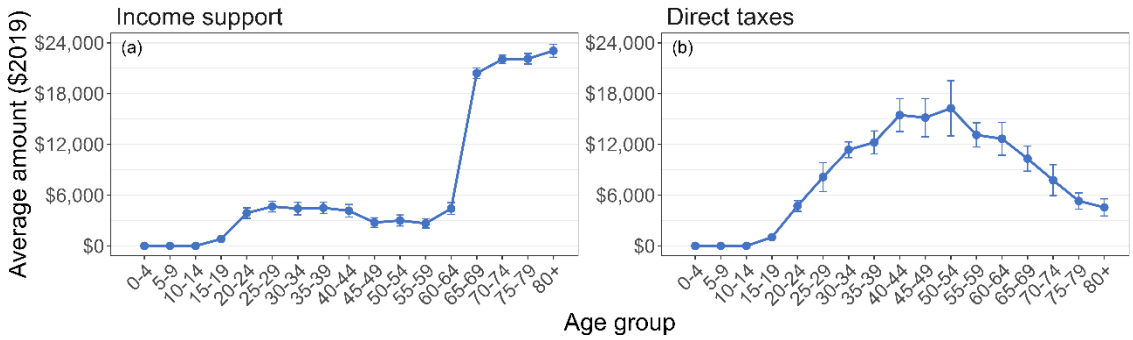
Intra-family shared disposable income and its components

In Figure 3 we illustrate the distributions over the age range of the two fiscal contributions to individuals' disposable incomes: income support payments and direct taxes. In this and subsequent figures we represent the age distributions of incomes and income components by presenting their average values incident on individuals in five-year age groups (with those individuals aged 80 or over grouped together), and indicate the sampling error (ie, 1.96 times the standard error of the point estimate) for each estimate.

We present in Figure 3(a) estimates of the average income support payments that individuals receive, gross of personal income tax, in each age group.[2] Note that, in general, income support payments received by a couple are distributed equally over the two partners in the couple, and their contributions may therefore appear in two different age groups.[3] We observe that average income support is substantially higher for the 65–69 and older age groups, ie, for those individuals at or above the age of eligibility (65 years) for New Zealand Superannuation and Veterans Pension (NZS),[4] than for younger groups.

Figure 3(b) shows the average direct taxes paid by individuals in each age group. These direct taxes include in general both personal income tax and the ACC earners' levy. The former is charged both on market income amounts and taxable income support payments, whereas the ACC earners' levy is only charged on wage/salary and self-employment income.

Figure 3: Income support and direct taxes



In Figure 4 we present the average market incomes of individuals in each age group (blue circles). We note that market incomes in the TAWA/HES sample include sources of investment income, such as rent on residential properties, interest payments, and dividends, in addition to market income derived from labour – ie, wage/salary and self-employment income. We do not distinguish these different classes of market income in our analysis, but note that as individuals typically accumulate capital over the course of their working lives (see, eg, Inland Revenue and The Treasury, 2018), the market incomes of older individuals – and particularly those past the age of NZS eligibility – will tend, with increasing age, to be increasingly composed of income derived from capital. By contrast, the market incomes of younger individuals will more commonly be derived from their labour.

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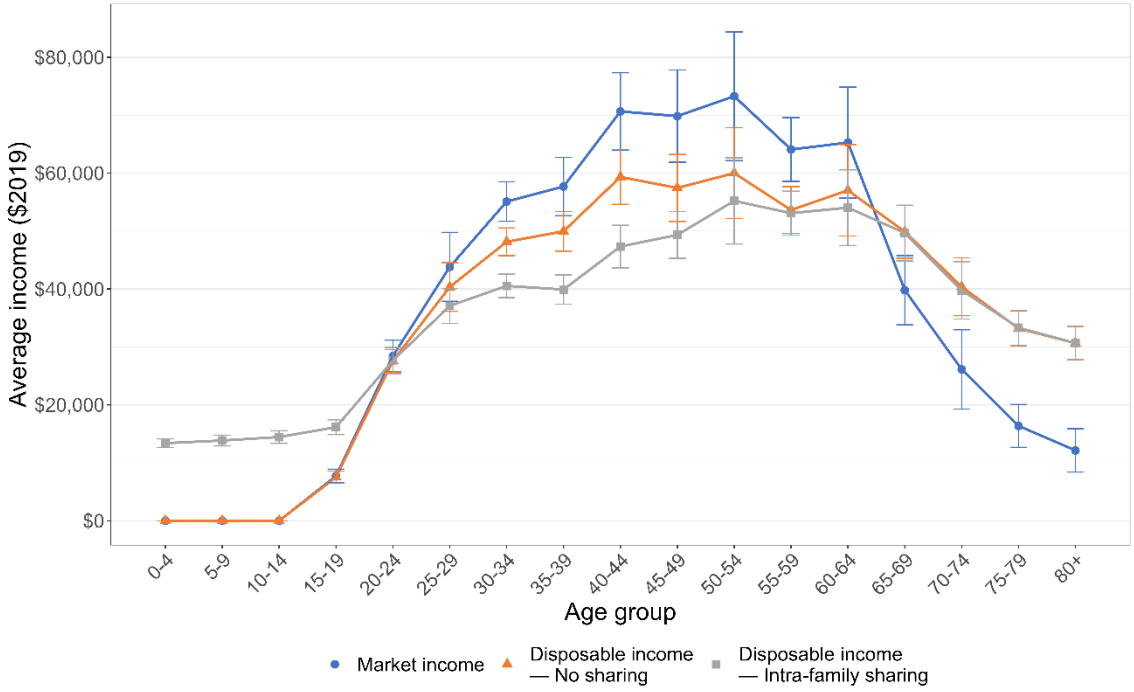
[2] In the Annex we present estimates of the average values of each of the broad constituent categories of income support defined in Wright and Nguyen (2024) incident on each age group.

[3] We discuss details of the allocation of income support payments received by individuals in couples, both in legislation and in our analysis, in the Annex.

[4] Note that we are using a broad definition of income support that includes NZS, which has a status in legislation distinct from that of the core income-replacement benefits.

We obtain the disposable incomes of individuals by adding any income support payments they receive to their market incomes, and then subtracting the direct taxes that they pay. We indicate the average values of these disposable incomes, prior to our application of the intra-family sharing assumption, by orange triangles in Figure 4. The shared disposable incomes that will form the basis for our analysis of final incomes are then derived by applying the intra-family sharing assumption. Estimates of the average values of these shared disposable incomes are indicated in Figure 4 by grey squares.

Figure 4: Market incomes, unshared disposable incomes, and intra-family shared disposable incomes



It is important to note that although our approach models the sharing of disposable income within families, it does not account for the sharing of housing consumption, or of housing costs, between individuals in a family or between families in a household.[5] Furthermore, whereas analyses of household incomes in New Zealand often consider measures of after housing costs household income (see, eg, Stephens, 2023 and references therein), the average disposable incomes we present in Figure 4, and all our subsequent results for disposable and final incomes, are not adjusted for housing costs.

We see from Figure 4 that the characteristic hump-shaped relationship between average market incomes and age groups is evened out somewhat when disposable incomes are considered. Moreover, the profile of shared disposable incomes across age groups is additionally flattened as compared to that of disposable incomes prior to our application of the intra-family sharing assumption.

The higher average values of shared disposable income, as compared to market income, at the lower end (age groups 0–4 through 15–19) of the age range, where dependent children appear, are entirely due to the sharing assumption. By contrast, at the upper end (65–69 and above) of the age range, the intra-family sharing assumption has almost no

[5] Moreover, our analysis does not account for the imputed rents of homeowners (cf., eg, Ching, 2023; Ching *et al.*, 2023; Inland Revenue, 2023).

effect on disposable incomes on average, and the higher values of disposable income as compared to market income here reflect more directly the action of the tax and transfer system itself.

For the age groups 25–29 through 50–54 around half of the reduction of average shared disposable income as compared to average market income is due to the action of the tax and transfer system, with the remainder due to the assumed sharing within families. A greater proportion of the reduction is due to sharing for individuals in the age groups 30–34 through 40–44, who are often parents[6] of dependent children,[7] reflecting the redistribution of disposable income from parents to their children implied by the sharing assumption.

For adults aged 55–64, who are less likely to have dependent children, the sharing assumption plays comparatively little role in the difference between average disposable incomes and average market incomes.

In-kind benefits, indirect taxes, and final incomes

In Figure 5 we present the distributions over age groups of in-kind spending on social services and indirect taxes. In accordance with IDI confidentiality rules (Stats NZ, 2020), in Figure 5 and subsequent figures we suppress estimates when their sampling errors exceed 50% of the point estimate (except for some highly derived quantities), or when the estimates are based on either sample counts less than 6 or weighted counts less than 3,000.

Figure 5: In-kind benefits and indirect taxes

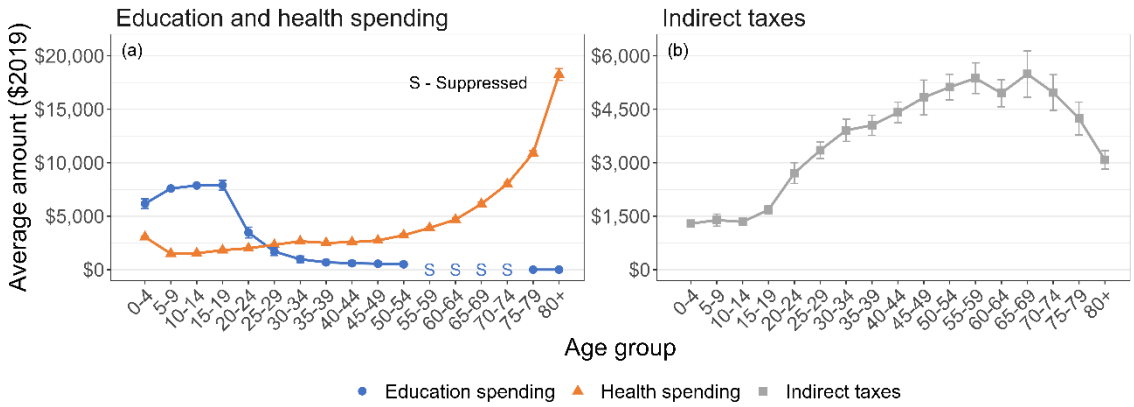


Figure 5(a) shows the average amounts of in-kind education and health spending on individuals in each age group.[8] We observe that the contributions of in-kind spending are the largest for the youngest and oldest individuals in the population. Education services dominate in-kind spending on those aged 0–19, while those aged 65 and older receive substantial in-kind health services spending.

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[6] We note that in general a caregiver of a dependent child is not necessarily the child's parent. In this note we will use the term "parent(s)" generically to refer to a dependent child's parent(s) or caregiver(s).

[7] We provide some results for the compositions of families and the roles of individuals within them across the age groups in the Annex.

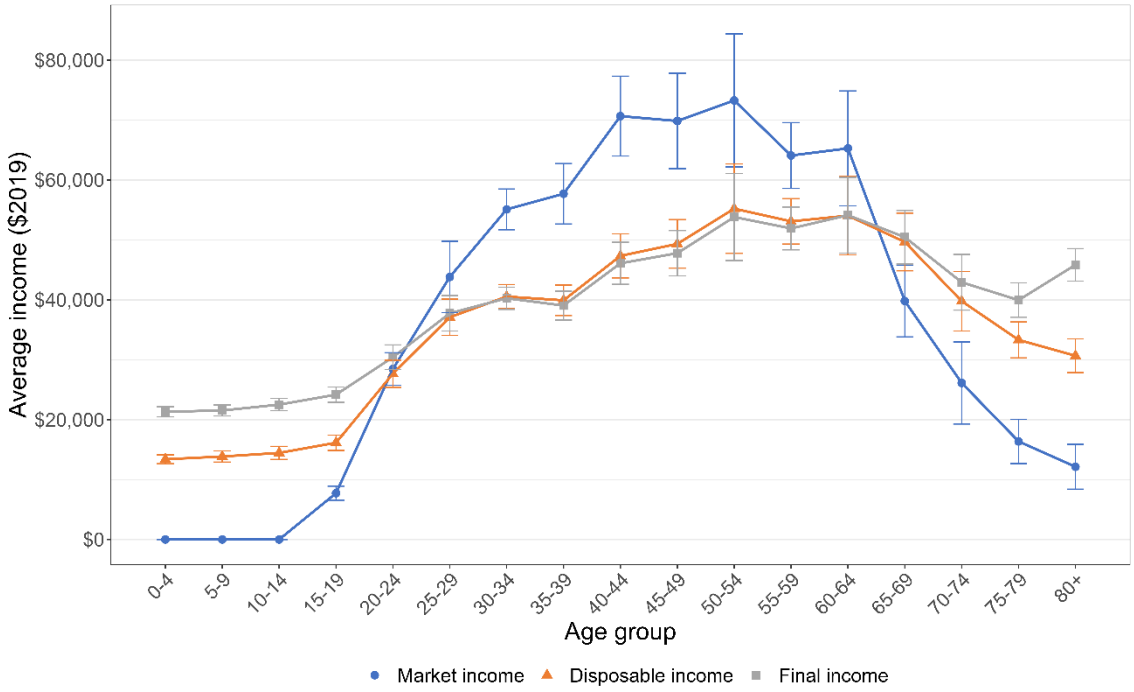
[8] A comprehensive analysis of the distribution of health expenditure over age groups and its implications for an ageing population has previously been given by Bryant *et al.* (2004).

We allocate indirect taxes from the household level to the family level in proportion to the total disposable incomes of families, and then share them within families according to the same intra-family sharing rule we use for disposable incomes (with exceptions for alcohol and tobacco excises, as we discuss in the Annex). We present the average values in each age group of the indirect taxes that we attribute to individuals in this way in Figure 5(b).

We observe that indirect taxes broadly follow the same pattern as shared disposable income, as noted by Aziz *et al.* (2013b, 2016). In Figure 5(b) these taxes reach their peak for an older age group (65–69) than shared disposable income (60–64), after which their decline broadly parallels it.[9]

We obtain the final income of each individual by adding to their shared disposable income the amounts of in-kind spending on education and health services that they receive, and subtracting the indirect taxes that they pay. In Figure 6 we present the resulting distribution of average final income over age groups (grey squares). For comparison we also include in this figure the average market income (blue circles) and shared disposable income (orange triangles) previously shown in Figure 4.

Figure 6: Market, disposable, and final incomes



We see from Figure 6 that average final incomes are appreciably higher for the youngest and oldest age groups compared to shared disposable incomes. Throughout the typical working years the net effect of in-kind spending and indirect taxes on average individual incomes in each age group is comparatively small.

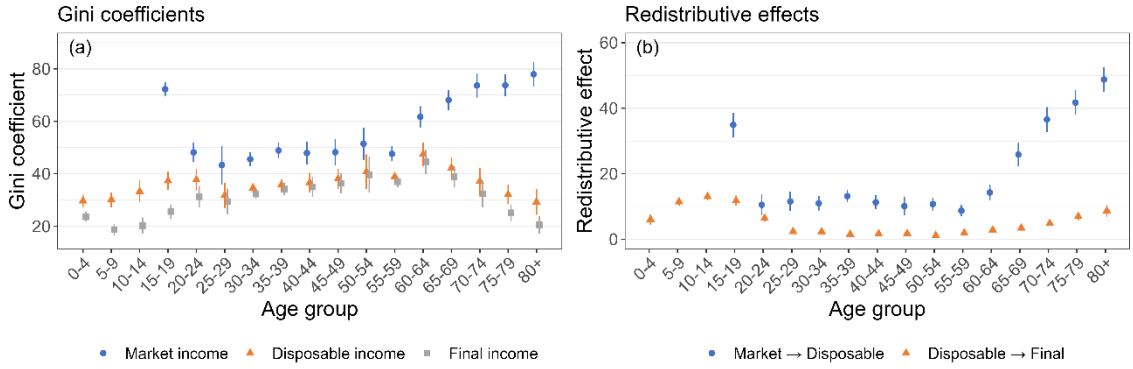
[9] It is not clear whether the dip in average indirect taxes we observe for the 60–64 age group in Figure 5(b) results from anything other than sampling variation. More accurate estimates of the consumption of households and individuals and the associated taxes could be obtained from a cohort analysis based on multiple HES years (see, eg, Gibson and Scobie, 2001).

Income inequality within each age group

Our results in Figure 6 illustrate how the average values of the three income concepts vary across the age range. However, these simple summary measures of these incomes do not reveal the dispersion or inequality of the distribution of each of the income types within each age group. We now characterise the inequality of the distributions of incomes in each age group by estimating the Gini coefficients of each of these distributions.

In Figure 7(a), we present estimates of the Gini coefficients for market, disposable, and final incomes within each age group. Figure 7(b) shows the corresponding redistributive effects, ie, the differences in Gini coefficients, between market and disposable incomes, and between disposable and final incomes.[10,11] In this analytical note we present Gini coefficients and redistributive effects in units of Gini points – ie, scaled by a factor of one hundred.

Figure 7: Gini coefficients and redistributive effects



We note that the Gini coefficients for market incomes reflect the inequality between those individuals who derive market incomes and those who do not, in addition to the inequality within the distribution of nonzero market incomes in each age group. For example, the large value of the market income Gini coefficient that we estimate for the 15–19 age group reflects the heterogeneity of this group, which includes dependent children attending high school, tertiary students, and youth in full-time employment or receiving income support benefits. Similarly, some component of each of the market income Gini coefficients that we obtain for age groups in the primary working years arises, for example, from the inequality in market incomes between working and non-working partners in couples, in addition to the inequality between working individuals and those in families with no sources of market income.

The estimates of the market income Gini coefficients through the range of age groups 25–29 through 60–64 shown in Figure 7(a) are suggestive of a broad increase in dispersion in market incomes with increasing age. However, the comparatively large sampling errors make it difficult to confidently identify a clear trend.

[10] We set any negative incomes, which may arise due to self-employment losses, to zero when estimating Gini coefficients and redistributive effects. We also omit Gini coefficients and redistributive effects based on the market incomes for the youngest three age groups, which are uniformly zero.

[11] We horizontally offset the markers for the Gini coefficients and redistributive effects in each age group by small relative displacements so that the confidence intervals on each can be seen more clearly.

Figure 7(a) indicates that for older age groups, market income inequality rises appreciably with increasing age. We note that the market income Gini coefficient appears to step up substantially before the age of NZS eligibility, in the 60–64 age group.[12] We associate this with individuals beginning to leave the labour force before the age of NZS eligibility. In the Annex (see Figure 11) we present estimates of labour force participation rates for individuals in different family roles and rates of receipt of income support payments illustrating this exit of individuals from the labour force prior to the age of 65.

With increasing age in the senior years, market incomes both decline on average (cf. Figure 6) and become increasingly concentrated on a smaller subset of individuals. The high market income Gini coefficients we observe for the oldest age groups result in part from the inequality between those seniors who continue to receive substantial market incomes after the age of eligibility for NZS, and those who derive little or no market income to supplement the NZS payments that they (in most cases) receive. It is important to note that although many senior citizens continue to participate in the labour force after reaching the age of 65 (as shown in Figure 11(a) in the Annex), much of the market income of individuals in this age range is likely to be derived from capital. We caution, however, that income derived from capital that is not taxed, or indeed not realised, is not captured in our analysis.[13]

Disposable income inequality, in contrast to market income inequality, decreases appreciably with increasing age past the 65–69 age group as the relative share of disposable incomes due to the near-universal NZS payment progressively grows. Income inequality under the final income definition decreases even more steeply in the senior age range. This is primarily due to health spending, which is reasonably broadly distributed across household income levels (Crawford and Johnston, 2004; Aziz *et al*., 2012; Wright and Nguyen, 2024) and moreover increases with increasing age in the senior years (see Figure 5(a)),[14] producing an increasing redistributive effect with increasing age, as seen in Figure 7(b).

Throughout the typical working years, disposable income inequality grows reasonably steadily (cf., eg, Deaton and Paxson, 1994; Creedy and van de Ven, 2001), and final income inequality follows this trend, at a slightly lower level. For the youngest age groups (0–4 through 15–19), the Gini coefficients for final income are substantially lower than those for disposable income, reflecting the broadly distributed contributions of education spending to final incomes in these age groups.[15]

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[12] Note that this apparent increase in market income Gini inequality with age seen for the 60–64 age group as compared to younger groups is exaggerated somewhat by the comparatively small Gini coefficient observed for the 55–59 group, which seems to be associated with the dip in mean market income seen for this group (Figure 6).

[13] We might expect, therefore, that our estimates of market income inequality are underestimates of the inequality of pre-tax, untaxed, or unrealised income in general (see Ching, 2023; Ching *et al.*, 2023; Inland Revenue, 2023), and for the senior population in particular – especially consider the inequality of the wealth distribution itself (Symes, 2021).

[14] Note, however, that the health expenditure amounts we assign to individuals represent the costs of the services they receive in expectation, based on their demographics, in an effective group-risk-related insurance premium sense (Crawford and Johnston, 2004), and do not account for the dispersion in the costs of health services actually received by individuals.

[15] The final income Gini coefficient is somewhat higher for the 0–4 age group as compared to the subsequent two age groups, primarily due to the contribution of early childhood education subsidies, which only apply to the older children in this group.

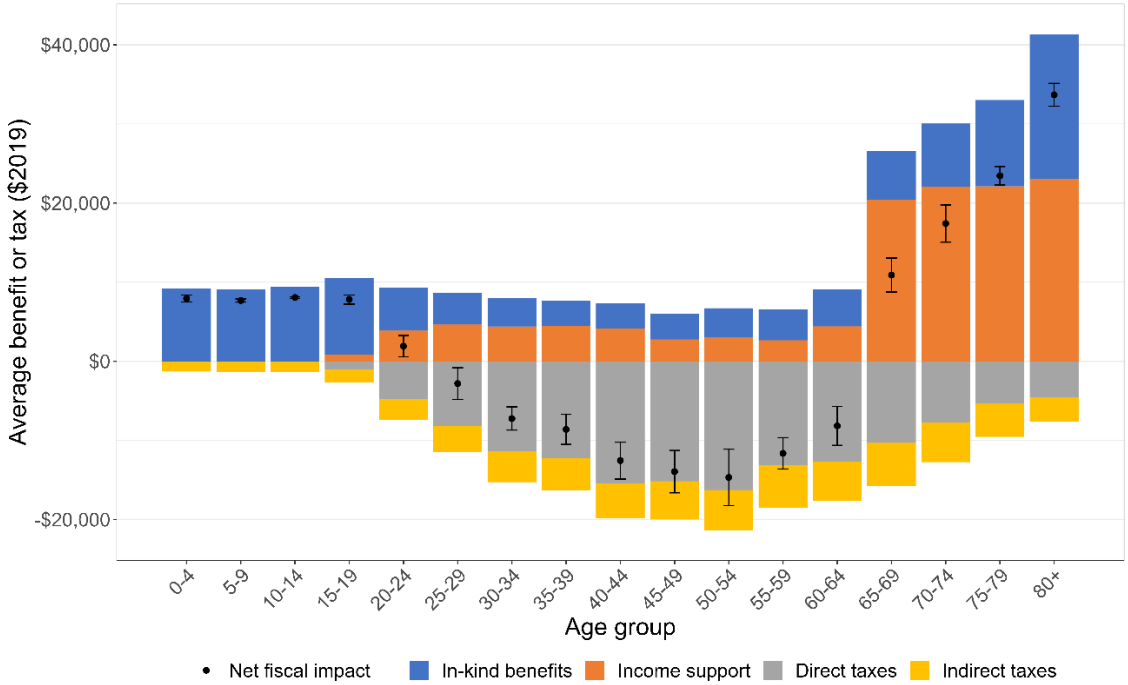
Net fiscal impact

We now consider the average net fiscal impact on individuals in each age group resulting from income support payments, in-kind benefits, and direct and indirect taxes. Following Aziz *et al.* (2013a, 2013b, 2014, 2016), we define the net fiscal impact on an individual in terms of the income support payments and direct taxes that are directly incident upon them.

We recall that when calculating final incomes, we combine the income support payments received, and direct taxes paid, by each individual with their market income to obtain their disposable income, which we then redistribute among the members of their family according to the intra-family sharing rule. By contrast, when deriving the net fiscal impact on an individual, we do not redistribute income support payments or direct taxes, or any quantities derived from them, between individuals. We do, however, apply the intra-family sharing assumption to derive the indirect taxes incident on each individual, as these taxes are estimated from household-level expenditure responses in HES.[16]

In Figure 8 we show the average net fiscal impact on individuals in each age group. We indicate the average values of the four tax and benefit components that contribute to the net fiscal impact as bars above and below the x axis.

Figure 8: Net fiscal impact and its tax and benefit components



The average net fiscal impact estimates shown in Figure 8 are similar to those found by Aziz *et al*. (2013a, 2013b, 2014, 2016). These impacts are negative for individuals in the age groups 25–29 through 60–64, and positive at younger and older ages. Individuals in the prime working age range are therefore net payers of tax on average, whereas those in the younger and older groups are, on average, net recipients of government spending. Government expenditure on children and young people is primarily allocated to in-kind education services, while for seniors it consists of NZS and other income support payments, in addition to health spending.[17]

[16] Note, however, our remarks in the Annex regarding our treatment of WfF tax credits and income-related rent subsidies.

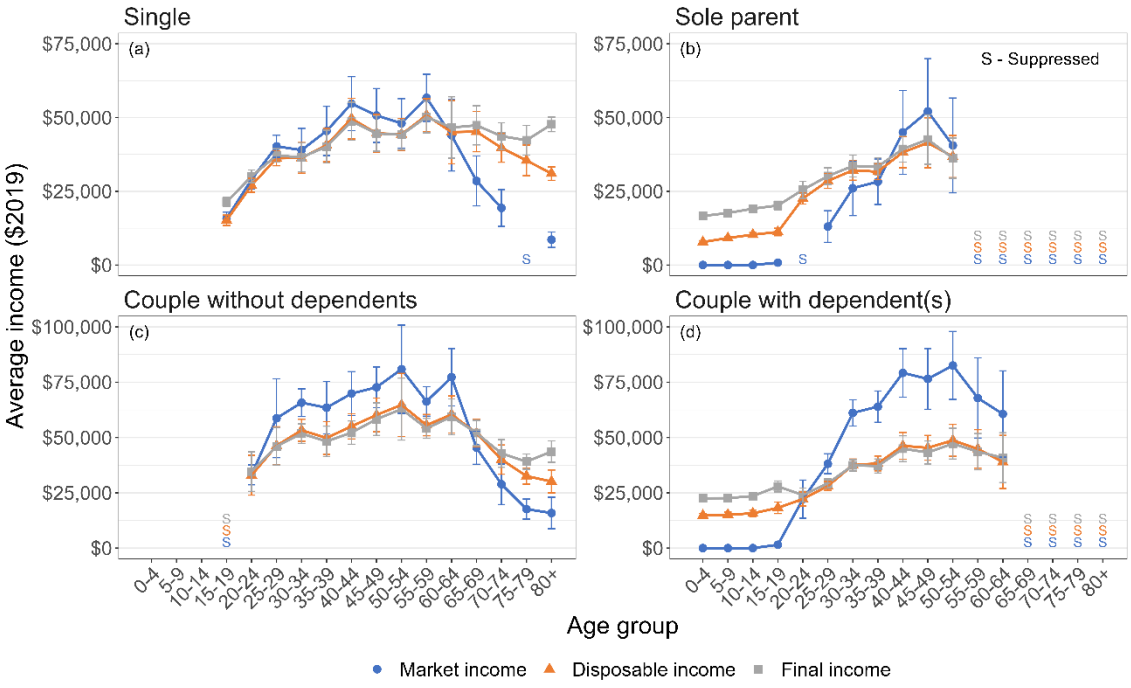
[17] In the Annex we present alternative net fiscal impact estimates in which income support payments and direct taxes are assumed to be shared in the proportions of the intra-family sharing assumption, the results of which are similar.

The distribution of taxation and social services spending across age groups, as illustrated in Figure 8, is an important consideration for fiscal policy, particularly given New Zealand's ageing population. We note that an approach to distributing taxes and in-kind expenditure on health and education services over age groups similar to ours is a core component of the Treasury's long-term fiscal modelling (The Treasury, 2021; Bell, 2021), which projects changes in government revenue and expenditure over time, based on projected demographic trends.

Average incomes by age and family type

In Figure 9 we present the average market, disposable, and final incomes of individuals in each of four family types: single-member families (Figure 9(a)), sole-parent families (ie, single adults with dependents; Figure 9(b)), couples without dependents (Figure 9(c)), and couples with one or more dependents (Figure 9(d)). Note that, whereas in general our results for average incomes of individuals in age groups constitute only proxies for the life-course trajectories of individuals' incomes, due to their nature as estimates based on a single survey cross-section, additional caution is required in interpreting the results in Figure 9 as an individual will typically transition between multiple different family types during their life.

Figure 9: Incomes in four different family types



As in Figure 6, the average market incomes we present in Figure 9 are unshared, whereas the average disposable and final incomes are based on the intra-family disposable income sharing assumption. We note, however, that the disposable and final income estimates shown in Figure 9(c) for couples without dependents are largely insensitive to the sharing assumption, as when applied to these families the sharing only redistributes income amounts

between age groups to the extent that partners in a couple do not belong to the same age group.[18] The intra-family sharing of disposable incomes is of course not applicable to the single-member families whose incomes are shown in Figure 9(a).

As the average income estimates we present in Figure 9 represent the averages over all individuals in each family type, our estimates for the 15–19 age group for the two family types containing children (Figures 9(b) and 9(d)) correspond to averages over both dependent children and parents in this age range. However, results for the distributions of individuals over age groups, family types, and roles within the family that we show in the Annex (see Figure 10) indicate that almost all individuals in the 15–19 age group that are non-dependents belong to single-member families – ie, there are very few parents in the 15–19 group. The average incomes for the 15–19 age group in Figures 9(b) and 9(d) can therefore be regarded to a good approximation as estimates for the dependent children in this age group in the two respective family types.

We see from Figure 9 that the average market incomes of individuals in couples both with and without dependent children are substantially higher than those of single adults and sole parents throughout the majority of the primary working years. The average market incomes of sole parents reach their peak in the 45–49 age group, where they are comparable to those of single adults in the same age group. However, the average market incomes of sole parents reach this level at substantially later ages than those of individuals in the other family types. This result is perhaps to be expected, as younger sole parents will presumably tend to have younger children, limiting their ability to participate in the labour force. The higher market incomes observed for older sole parents may therefore reflect their comparatively reduced childcare responsibilities, allowing for greater labour force participation.[19]

The combined action of the tax and transfer system and the intra-family sharing assumption results in average disposable incomes for coupled parents in the age groups 30–34 through 50–54 that are similar to those for single adults without children, and somewhat lower (higher) than those for childless couples (sole parents), in the corresponding age groups. Moreover, the average disposable and final incomes of the children of coupled parents are consistently higher than those of the children of sole parents in the age groups 0–4 through 15–19 in which dependent children appear.[20] For all four family types, average final incomes are in general not appreciably different from average disposable incomes throughout the typical working years, as was observed for the whole population in Figure 6. The average final incomes of individuals are elevated above the corresponding average disposable incomes at the youngest and oldest ages, due to the contributions of in-kind spending on social services, for those family types that include individuals in these age ranges.

[18] The mean and median age differences between partners in all couples based on the TAWA/HES sample are 4.0 ± 0.2 and 3.0 ± 0.0 years, respectively. In 45.1 ± 2.0% of couples both partners fall into the same five-year age group, and a further 37.7 ± 2.0% of couples span two neighbouring age groups.

[19] We find from the TAWA/HES sample that sole parents typically have fewer dependent children than coupled parents. We obtain for sole-parent families mean and median numbers of dependent children of 1.69 ± 0.11 and 1 ± 0.34, respectively. For couples with dependent children the mean and median child counts we obtain are 1.89 ± 0.05 and 2 ± 0.0, respectively.

[20] Evidence associating the numbers of working parents in families with the prevalence of various indicators of child poverty has been presented and discussed by Stephens (2022).

Summary

We have presented in this analytical note results for the final incomes of individuals in New Zealand in the 2018/19 tax year. We derived final incomes by distributing disposable incomes and indirect taxes over individuals using an intra-family sharing rule and incorporating estimates of in-kind education and health services spending. We estimated mean values of market, disposable, and final incomes across a range of five-year age groups, and calculated Gini coefficients for these income types in each age group. We also presented the variation of the average net fiscal impact of taxes, income support payments, and in-kind benefits on individuals across the age range. Additionally, we examined how average market, disposable, and final incomes vary by age in each of four different family types.

Our results illustrate how the impacts of fiscal policies on individuals vary across the life course. Younger individuals receive positive net benefits primarily due to education and health spending, whereas older individuals benefit mainly from spending on health services and New Zealand Superannuation. Individuals in the prime working age range are, on average, net payers of tax after accounting for the income support payments and in-kind benefits they receive.

We found that throughout the primary working years disposable and final income inequality are similar and increase steadily with increasing age. However, income support payments, taxes, and in-kind social services significantly mitigate the income inequality of market incomes observed for seniors, which is substantial and increases with increasing age.

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Annex

Sharing of disposable incomes and indirect taxes

Intra-family mOECD sharing

In our analysis we characterise the final incomes of individuals, in contrast to our previous study (Wright and Nguyen, 2024), which – like the earlier works of Crawford and Johnston (2004) and Aziz *et al.* (2012) – considered only household incomes. For this purpose, we follow Aziz *et al.* (2013a, 2013b, 2014, 2016) in regarding disposable income sharing as the mechanism by which resources are shared within a family, and in assuming a particular rule for this sharing. As we assign education and health services expenditure directly to individuals, no sharing assumption is required for these amounts. However, we share indirect taxes over individuals in a manner similar to our approach to the sharing of disposable incomes. In this Annex we will refer to our approach to sharing disposable incomes and indirect taxes as intra-family mOECD sharing.

Our methodology for distributing incomes and indirect taxes involves sharing within TAWA economic family units. Such a family unit consists of either one adult, or two partnered adults, with potentially one or more dependent children. The definition of a dependent child in TAWA aligns with the WfF legislation.[21] All children under the age of 15 are considered to be dependents. Those children aged between 15 and 17 who are not working full time or receiving a Ministry of Social Development benefit are regarded as dependents if they are either attending tertiary education or deriving less than $5,000 annually in regular taxable income. Individuals aged 18 that are living at home and meet these same requirements are considered to be dependent children if they are studying at least part time. TAWA uses this definition of a dependent child to assess eligibility for, and assign, WfF tax credits and other transfers. All individuals that are not dependent children are considered to be adults.

Figure 2 in the main text presents an example of the separation of members of a household into TAWA families.[22] This example illustrates two important features of the family definition. First, whereas dependent children always belong to the same family as their parent(s), any other relative of their parent(s) living in the same household – in this case, a grandparent of the dependent children – is regarded as a separate family. A TAWA family therefore consists of at most two generations. Second, a child is not considered to be part of the same family as their parents if they are not a dependent child. Here, an 18-year-old working full time is considered to constitute their own family, independent of their parents and sibling. When assessing the eligibility of an individual for income support transfers, TAWA in general considers the characteristics of all members of that individual's family.

Following Aziz *et al.* (2013a, 2013b, 2014, 2016), we distribute disposable income amounts among members of a TAWA family in proportions corresponding to the mOECD equivalence scale in Equation (1). This approach to the sharing of disposable incomes over family members relies on the identification of the principal earner in the family, who is regarded as the "first" adult in the family for the purposes of Equation (1). We identify as the principal

[21] See the Income Tax Act 2007, Subpart MC.

[22] We find from the TAWA/HES sample that 70.0 ± 1.1% of households consist of a single TAWA family, 19.0 ± 1.4% consist of two families, and 7.7 ± 0.8% consist of three families. The remaining 3.3 ± 0.6% of households contain four or more families.

earner in each family the (non-dependent) individual with the largest absolute market income (including investment income), with any ties broken arbitrarily.[23, 24]

We assign a weight w of 1 to the principal earner in the family, a weight of 0.5 to the second adult (ie, the partner of the principal earner), if one is present, and a weight of 0.3 to each of any children in the family. We then attribute to each individual in the family a proportion w/E of the family's total disposable income. Figure 2 shows these disposable income proportions for a family in the example household.

We share indirect taxes (GST and alcohol, petrol, and tobacco excises) among individuals in each family in a similar way to our sharing of disposable incomes. In our approach to estimating fiscal incidence, these indirect tax amounts are derived from household-level expenditure responses in HES (Crawford and Johnston, 2004; Aziz *et al*., 2012; Wright and Nguyen, 2024). In general, we must therefore distribute the household totals of each of the indirect tax components over the families in a household before sharing them between the individuals in each family. Our standard approach is to share indirect taxes over families in a household in proportion to each family's share of the household's total disposable income. We then share these amounts over the individuals in each family in the proportions w/E corresponding to Equation (1).

We note that this implies that in our approach we distribute indirect taxes over individuals in a household in the same proportions as disposable incomes. However, as alcohol and tobacco can only be purchased legally by individuals aged 18 or over, we follow Aziz *et al*. (2013a, 2013b, 2014, 2016) in adjusting the distribution of excises charged on these two consumption categories so that they are not allocated to individuals aged under 18. Moreover, alternative rules for the distribution of indirect taxes over the families in a household must be applied in some cases due to the presence of families with zero or negative disposable incomes. We provide further details of our approach to sharing indirect taxes later in this section.

Income, tax, and benefit amounts prior to applying intra-family sharing

We apply our intra-family income sharing approach to disposable income amounts calculated using the methodology of our previous fiscal incidence analysis (Wright and Nguyen, 2024). Specifically, we first use TAWA to derive the market incomes of individuals, and the income support and direct tax components incident upon them. We then apply uniform adjustments to ensure that aggregate values based on the TAWA/HES sample match known fiscal totals. Each individual's disposable income is then obtained by deducting the direct taxes they pay from the market income and income support payments that they receive.

In general, where a couple is eligible for an income support payment, TAWA distributes the payment equally over the two individuals in the couple, consistent with the action of the tax and transfer system itself. It is important to note, therefore, that income support amounts (Figures 3(a) and 8), and disposable incomes prior to our application of intra-family mOECD sharing (Figure 4), result from this equal sharing of income support payments between the two partners in a couple, where applicable.

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[23] Specifically, where ties arise, we identify as the principal earner the individual with the smaller value of the TAWA person identifier, which corresponds in most cases to the individual with the smaller value of the `snz_hes_uid` IDI unique identifier. We note that, for example, this assignment tends to favour the survey respondent within the household.

[24] This assignment overrides the family principal earner assignment made by TAWA, which identifies as the principal earner the non-dependent individual with the largest value of total wage/salary and self-employment income.

Legislatively, and in the standard operation of TAWA, WfF tax credits are allocated to the primary caregiver, which in the case of a couple TAWA identifies as the partner of the principal earner. In our analysis, we redistribute any WfF tax credits received by a couple evenly across both partners and adjust their total income support and disposable income amounts correspondingly.[25] As direct taxes are not deducted from WfF payments, no corresponding adjustment to these taxes is necessary.

As income-related rent subsidies are not calculated by TAWA in its standard operation, we impute these subsidies to households in the TAWA/HES sample based on housing tenure responses in HES (Aziz *et al*., 2012; Wright and Nguyen, 2024). To obtain estimates of the subsidy amounts incident on individuals, we distribute the subsidy assigned to each household uniformly over all adults (ie, non-dependents) within it.

Sharing of indirect taxes over families in a household

In the case that more than one family is present in a household, we must first share indirect tax amounts over the families in it, before applying the intra-family sharing rule. Two of the indirect tax components, alcohol and tobacco excises, are charged on goods that cannot legally be sold to individuals under the age of 18. We therefore share these excise amounts using an approach that is slightly different from our sharing of the other two components of indirect tax (GST and petrol excise).

We follow Aziz *et al*. (2013a, 2013b, 2014, 2016) in sharing household GST and petrol excise amounts in proportion to each family's share of their household's total disposable income. For example, in the case of a household containing two families, in which the total disposable income of the first (second) family is 70% (30%) of the total disposable income of the household, we assign the first (second) family a weight of 70% (30%) and distribute the household's total GST and petrol excise amounts over the two families in proportion to these family weights. We therefore assign families with zero disposable income zero share of their household's GST and petrol excise totals.[26] In any household in which all families have zero disposable income, we define the family weights in proportion to the mOECD equivalence scale of each family. That is, we assign each family in the household a weight given by E (from Equation (1)), evaluated for the family, divided by the sum of the values of E obtained for all families in the household.

Some families in the TAWA/HES sample may have negative disposable incomes, due to self-employment losses. In households containing such families, we define the family weights in proportion to each family's absolute disposable income.

When sharing alcohol or tobacco excise amounts over the families in a household, we set the family weights of any families that contain no individuals aged 18 or over to zero. We then assign all other families in the household a proportion of the corresponding total household excise equal to their family weight divided by the sum of all nonzero weights of families in the household. Where any household contains no individuals aged 18 or over,

[25] We do not, however, redistribute paid parental leave amounts over the two partners in a couple, as these (taxable) payments compensate a child's primary carer for time spent off work, providing an amount based on the carer's usual earnings, irrespective of their partner's income.

[26] This differs from the approach described by Aziz *et al*. (2013a, 2014), which applies a distinct rule for the allocation of indirect taxes to families in households that contain a family with a total disposable income below some *de minimis* threshold.

we set the alcohol and tobacco excise amounts for the household to zero and uniformly scale the corresponding excise amounts of all other households to maintain the known fiscal totals for these excises when aggregating over all households.

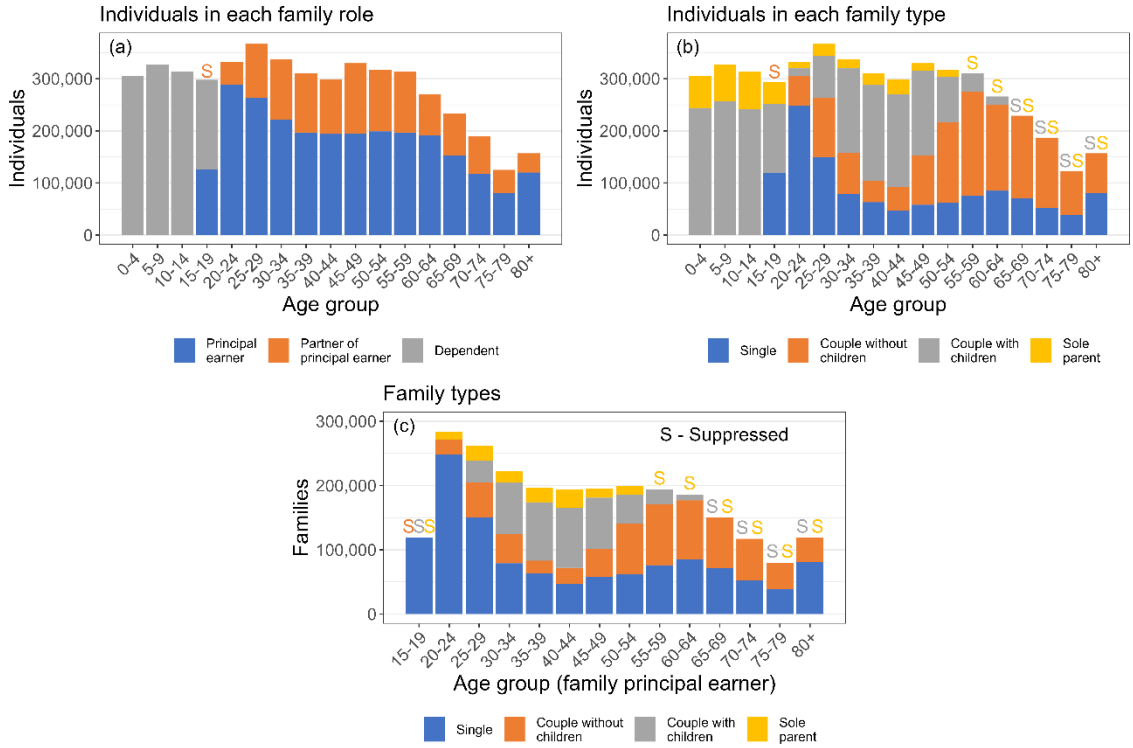
Having obtained the values of each of the indirect taxes incident on each family, we then distribute the family total GST and petrol excise amounts over the individuals in a family in the same proportions as we distribute disposable incomes. When sharing alcohol and tobacco excises within families, we set the weight w of any individual aged under 18 to zero, and distribute the family excise totals over the remaining family members in proportion to their shares of the sum of the remaining nonzero intra-family mOECD weights in the family.

Family compositions, labour force participation, and income support components

In this section we present some supplementary results that assist in the interpretation of our primary estimates. Although more accurate estimates for these quantities could be obtained from other data sources, we base all the results we present here on the TAWA/HES sample for consistency with our results in the main text.

In Figure 10 we illustrate how family compositions vary over the age groups. We present in Figures 10(a) and 10(b) for each age group the total number of individuals in each family role and in each family type, respectively. Figure 10(c) shows the distribution of the four family types over the age groups of their principal earners.

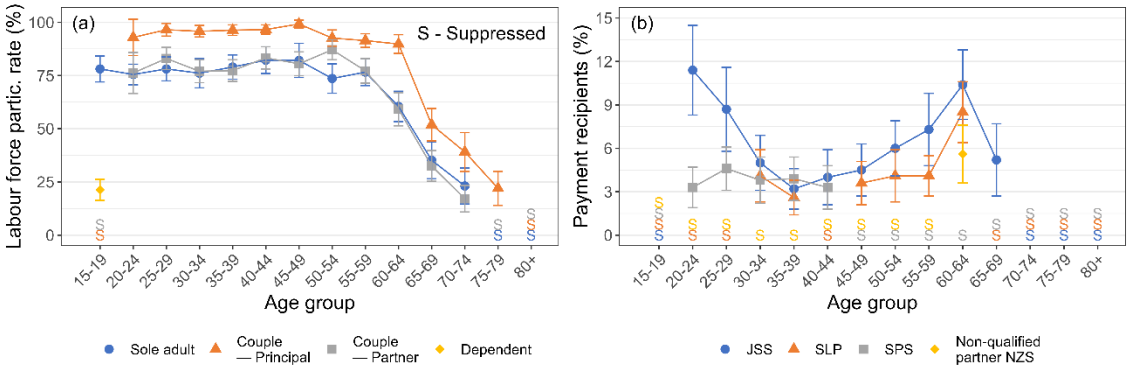
Figure 10: Distributions of family roles and types over age groups



We present in Figure 11 results that assist the interpretation of the variations of average market incomes and market income inequality over age groups shown in Figures 6 and 7, respectively. Figure 11(a) displays the labour force participation rates estimated from the TAWA/HES sample for sole adults, principal earners and partners of principal earners in couples, and dependents in the 15–19 age group,[27] while Figure 11(b) shows the proportion of individuals in each age group receiving each of four selected income support payments.

We see from Figure 11(a) that the labour force participation rates of principal earners in couples are significantly higher than those of both partners of principal earners and sole adults in all age groups.[28] Furthermore, whereas the labour force participation rate of principal earners in couples declines only marginally between the 50–54 and 60–64 age groups, whereafter it steeply declines, the corresponding rates for partners of principal earners and single adults are markedly lower in the 60–64 age group as compared to the 50–54 age group (cf. the behaviour of the market income Gini coefficient in Figure 7). We note, however, the reasonably high levels of labour force participation for individuals in the 65–69 and older age groups shown in Figure 11(a), consistent with results previously obtained for New Zealand labour force participation rates (see, eg, Hyslop *et al.*, 2019 and references therein).

Figure 11: Rates of labour force participation and benefit receipt



In Figure 11(b) we show the percentage of individuals in each age group receiving each of the core income support benefits – Jobseeker Support (JSS), Supported Living Payment (SLP), and Sole Parent Support (SPS)[29] – and the non-qualified partner NZS payment, which was available in the 2018/19 tax year to individuals aged under 65 who were partnered to qualified NZS recipients,[30] subject to an income test. We observe that a substantial fraction of all adults in the 60–64 age group receive either the non-qualified partner NZS payment, SLP, or JSS. Moreover, the appreciable fraction of individuals receiving JSS in the 60–64 group follows a trend of JSS receipt rates increasing with increasing age group, after reaching their minimum in the 35–39 group. We note also that given the eligibility requirements for JSS, we expect that recipients of this benefit will more commonly be unpartnered individuals.

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[27] In each case we discard any individuals with unknown labour force status when calculating the labour force participation rate.

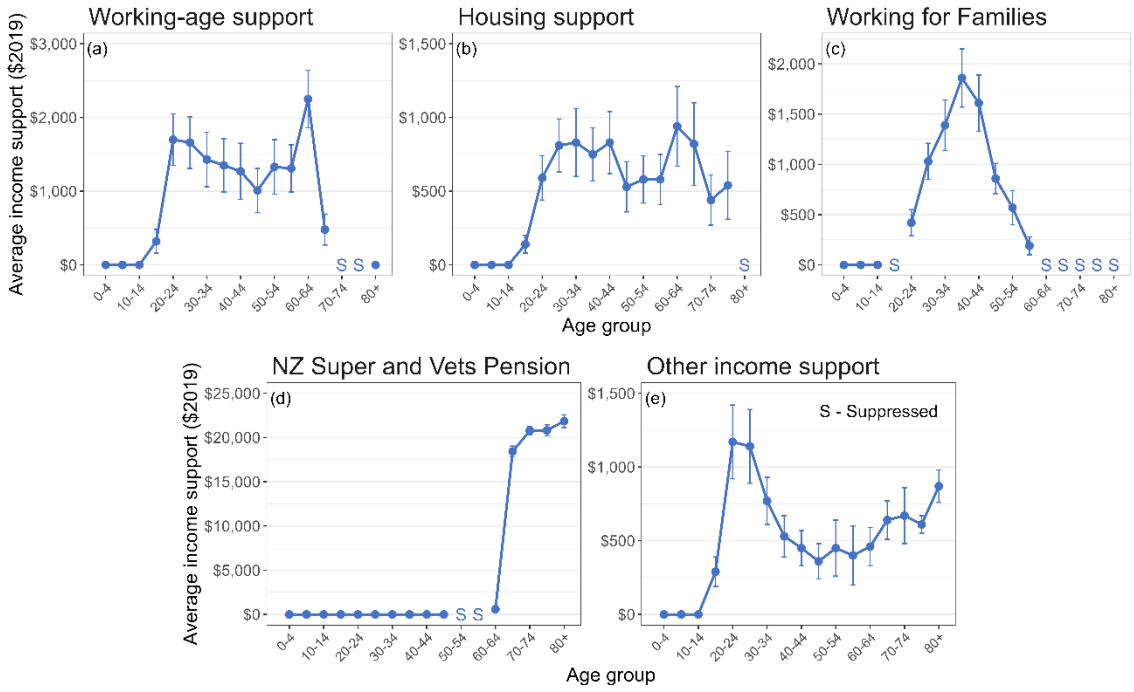
[28] We would of course expect in general that the principal earner in a couple (ie, the individual with larger absolute market income) is more likely to be in the labour force than their partner. We note, however, that as our results are based on a single survey cross-section they cannot capture any changes in principal earner or labour force status that may occur over time.

[29] Note that labour force status is not, in general, straightforwardly related to receipt of core benefits, as individuals may, eg, receive JSS while employed, or not receive JSS despite being unemployed or not in the labour force (Stats NZ, 2022).

[30] The non-qualified partner NZS payment could also be claimed by individuals, partnered to qualified NZS recipients, aged 65 or over but ineligible to receive NZS themselves for other reasons. Here we restrict our consideration of the non-qualified partner NZS payment to those individuals aged under 65. The NZS payment for non-qualified partners was discontinued on 9 November 2020.

In Figure 12 we present a disaggregation of the average income support received by each age group (Figure 3(a)) into the component categories defined in Wright and Nguyen (2024). We note the comparatively large average amount of working-age support received by individuals in the 60–64 age group (cf. Figure 11(b)), and the broadly persistent level of housing support payments across age groups 20–24 through 75–79. Other income support reaches its highest levels in the 20–24 and 25–29 age groups and exhibits a broad upwards trend beginning in middle age and continuing into the senior years.

Figure 12: Components of income support



A further disaggregation of the other income support category (not shown) reveals that student allowance payments are the largest component of this category in the 20–24 and 25–29 age groups, and that paid parental leave is an appreciable contribution to this category for age groups 25–29 through 35–39. Other income support received by individuals in the 65–69 and older age groups consists primarily of Winter Energy Payment, and other non-taxable benefits (ie, Ministry of Social Development supplementary benefits).

Consequences of the intra-family sharing assumption

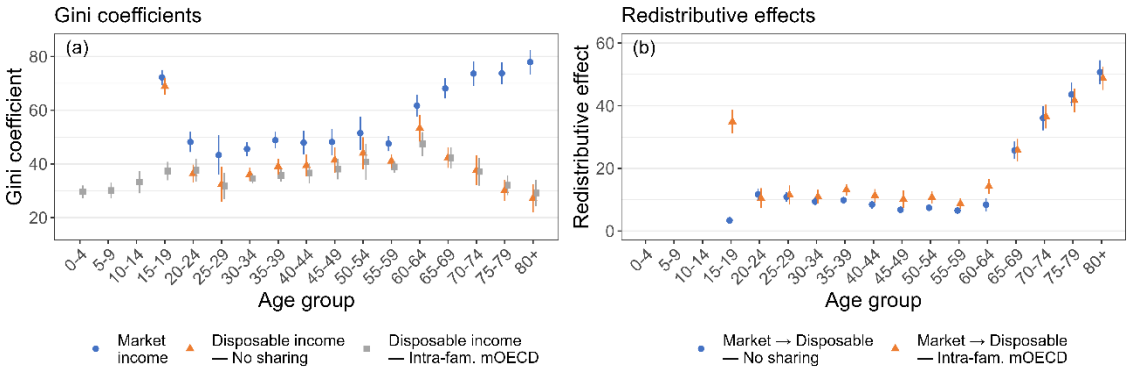
The lower Gini coefficients observed for shared disposable incomes as compared to market incomes in Figure 7(a) reflect both the redistribution due to direct taxes and income support payments, and that due to the intra-family sharing assumption that we apply. In Figure 13(a) we present the Gini coefficients for unshared disposable income in each age group, together with those for (unshared) market income and shared disposable income. Figure 13(b) shows the corresponding redistributive effects between market and unshared disposable income, and between market and shared disposable income.

For age groups 20–24 through 55–59, the Gini coefficients for unshared disposable incomes are similar to those for shared disposable incomes, though they are in most cases marginally higher. This indicates that the majority of the reduction in income inequality between the market and disposable income distributions in these groups is accounted for by the action of the tax and transfer system itself, before the intra-family sharing assumption is applied.

For the 15–19 age group, the Gini coefficient of unshared disposable income is much closer to that of market income than that of shared disposable income. Although some individuals in this group receive income support payments, the overall action of the tax and transfer system does not substantially reduce the income inequality between those youth aged 15–19 who derive market incomes and those who are dependents of their parents, and have zero disposable income prior to the application of the intra-family sharing assumption.

In the 60–64 age group, the Gini coefficient of unshared disposable income is around halfway between that of market income and shared disposable income. The intra-family sharing assumption therefore accounts for a somewhat greater proportion of the income inequality reduction observed for this age group as compared to that seen for the other groups in the primary working age range. This is possibly due to the relatively high proportion of couples in this group with one partner not in the labour force (cf. Figure 11(a)).

Figure 13: Effects of intra-family sharing on Gini coefficients and redistributive effects



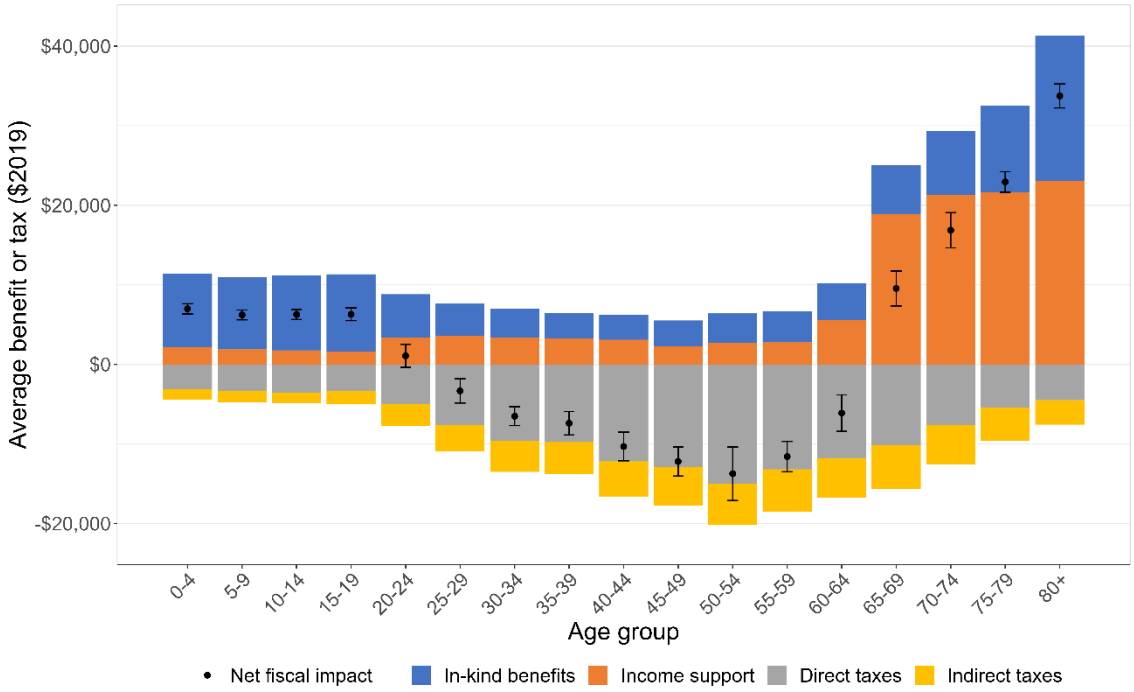
In each of the 65–69 and older age groups the Gini coefficients for shared and unshared disposable incomes are similar to each other. However, the Gini coefficients for shared disposable income gradually become larger than those for unshared disposable income with increasing age group in this range. We note that in the limit that they receive income from no other sources, each partner in a senior couple will typically receive an equal NZS payment, and the sharing assumption will allocate a greater share of these payments to one partner. This biasing of the disposable income Gini coefficients upwards by the sharing assumption is gradually revealed with increasing age group in this range, as the relative contributions of incomes derived from market sources to disposable incomes diminish (cf. Figure 6).

The estimates of average net fiscal impacts on individuals and their constituent tax and benefit components that we presented in Figure 8 only employed intra-family sharing to apportion indirect taxes to individuals. However, that approach does not align with our estimation of disposable and final incomes, in which income support payments received, and direct taxes paid, by one individual in a family in general affect the disposable and final incomes of all other members of their family through the intra-family disposable income sharing assumption.

In Figure 14 we show estimates for the net fiscal impact and its components obtained using an alternative approach, in which income support payments and direct taxes are distributed over the members of each family in proportion to their intra-family mOECD weights. We caution that this assumption is a stronger, and less defensible, one than the disposable income sharing assumption upon which our estimates of final incomes (Figure 6) are based. However, this approach to estimating the net fiscal impact has the advantage of separately

distributing income support payments and direct taxes over individuals in the same way that they are, together with market incomes, implicitly distributed in our application of the intra-family sharing of disposable incomes. The fact that the resulting net fiscal impact estimates in Figure 14 are reasonably similar to those in Figure 8 provides us with additional confidence in our approach to deriving our primary estimates for these quantities.

Figure 14: Net fiscal impact and its components under intra-family mOECD sharing of income support and direct taxes



Alternative disposable income sharing assumptions

In this section we consider two alternative sharing assumptions, to investigate the sensitivity of our results to variations in the form of the disposable income sharing rule. In both alternative approaches, as in the case of intra-family mOECD sharing, we only redistribute disposable incomes and indirect taxes between individuals, and we attribute in-kind spending on education and health services directly to each individual.

The first alternative sharing assumption that we consider is the equal sharing of disposable incomes within a family, which was also considered by Aziz *et al.* (2013b, 2016). In this case we replace the generally unequal weights of individuals within each family corresponding to the mOECD equivalence scale (Equation (1)) with equal weights. We then share disposable incomes in a manner analogous to our application of intra-family mOECD sharing, but now using these equal weights. We obtain the family totals of the individual indirect tax components from the corresponding household totals in the same way as for intra-family mOECD sharing. Our approach to distributing these indirect taxes within families is obtained from our prescription for intra-family mOECD sharing by replacing the intra-family mOECD weights with the equal intra-family weights.

The second alternative sharing assumption that we consider is intra-household mOECD sharing. In this case, we ignore the distinction of individual families within a household and share the total disposable income of the household over all individuals in it. We introduce mOECD weights for individuals within each household, which, like the intra-family mOECD

weights, correspond to the equivalence scale Equation (1), but are distinct in that the counts C of children and A of adults are now the numbers of household members aged under 14, and 14 or over, respectively.[31] (Note that A will therefore be greater than 2 in some households.) We define as the principal earner in each household the individual aged 14 or over with the largest absolute market income (with any ties broken arbitrarily). Our approach to distributing disposable incomes and indirect taxes over the individuals in each household using the intra-household weights is then analogous to our approach to applying intra-family mOECD sharing within each family in deriving our primary results, including our treatment of the individual indirect tax components.

We use the equal intra-family sharing assumption to test the sensitivity of our results to the particular weights with which we distribute amounts within a family. By contrast, intra-household mOECD sharing serves as a test of the sensitivity of our estimates to the segregation of the disposable income of a family from that of any other families present in the same household that is assumed in our application of the intra-family mOECD sharing rule. The intra-household sharing rule will in some cases share disposable incomes between individuals that are in reality financially independent, but has the simplicity of only referring to the household, which, unlike the TAWA family, is a fundamental unit in the HES sample.

In Figures 15(a), 15(b), and 15(c), we show estimates for average disposable incomes, indirect taxes, and final incomes, respectively, obtained using our two alternative sharing assumptions, together with the results for these quantities we obtain using intra-family mOECD sharing. As compared to intra-family mOECD sharing, intra-family equal sharing results in larger estimates for both average disposable incomes and indirect taxes for age groups 0–4 through 15–19, and smaller values for these quantities in the groups 25–29 through 60–64. The effect of replacing the intra-family mOECD sharing rule with the intra-family equal sharing rule on the estimates of average indirect taxes is qualitatively similar to the effect on the estimates of average disposable incomes. As the (subtractive) contributions of indirect taxes to final incomes are in general much smaller than the contributions of disposable incomes to these quantities, the corresponding changes in the estimates of average final incomes are similar to those in the estimates of average disposable incomes.

Intra-household mOECD sharing results in average disposable income estimates that differ from those obtained by intra-family mOECD sharing primarily in that average disposable incomes are raised for age groups 15–19 and 20–24, and lowered for the groups 45–49 through 60–64. This reflects a redistribution of disposable income from older adults to younger household members (eg, from parents to their adult children, or to any of their teenaged children that constitute their own families, independent of their parents, under the TAWA family definition). The effects of substituting intra-household mOECD sharing for intra-family mOECD sharing on average indirect taxes and final incomes are similar to the effects on average disposable incomes.

The net fiscal impact shown in Figure 8 utilises the intra-family sharing assumption only through the contributions of indirect taxes. The changes to these taxes arising from the use of the alternative sharing assumptions therefore yield only comparatively small variations to the net fiscal impact, as noted by Aziz *et al.* (2013b, 2016), and we do not show these here.[32]

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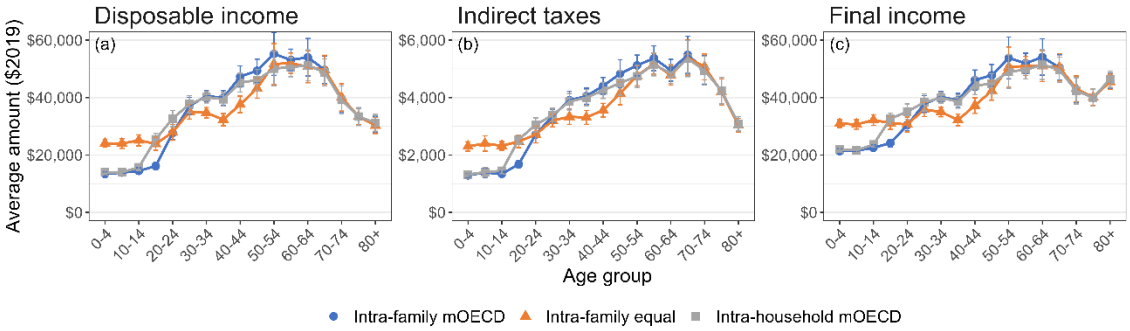
[31] This choice of age threshold distinguishing “adults” from “children” is the one used, for example, by Stats NZ in its application (Stats NZ, 2024) of the mOECD equivalence scale (Hagenaars *et al*., 1994) to household incomes.

[32] Substituting either alternative sharing assumption would further adjust the alternative estimates of net fiscal impacts that we present in Figure 14, through their actions on income support and direct taxes, but we do not consider these effects here.

Figure 15: Incomes and indirect taxes under alternative sharing assumptions



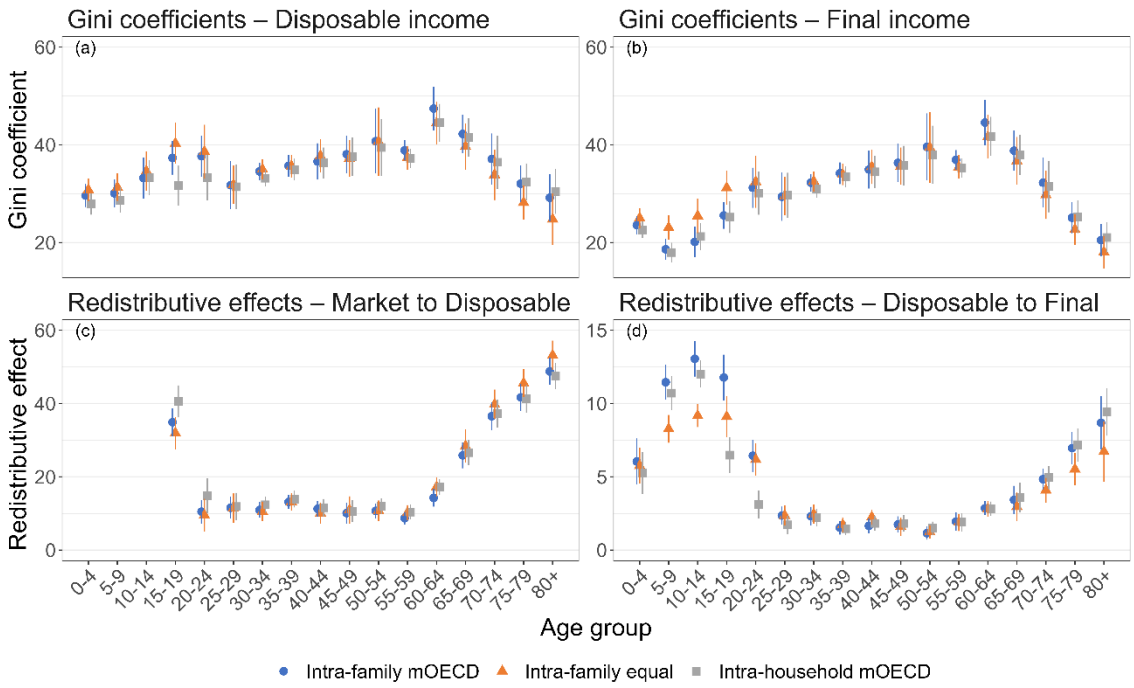
In Figures 16(a) and 16(b), we present the estimates for the Gini coefficients of disposable and final income, respectively, in each age group that we obtain using each of the three sharing assumptions. Figures 16(c) and 16(d) show the corresponding estimates of the redistributive effects between market and disposable income, and between disposable and final income, respectively.

We observe from Figures 16(a) and 16(b) that, for both disposable and final incomes, the Gini coefficients resulting from the three different sharing assumptions are similar to one another in each of the age groups 25–29 through 50–54. For the 55–59 and older age groups intra-family equal sharing results in somewhat lower disposable income Gini coefficients than intra-family mOECD sharing. This is perhaps not surprising, as most adults in this age range are not in families with dependent children (cf. Figure 10(b)), and the equal sharing of incomes within couples without dependents will tend to lower the income inequality within an age group.

The largest differences between disposable income Gini coefficients under intra-family mOECD sharing and those obtained by intra-household mOECD sharing are seen for the 15–19 and 20–24 age groups. Here the Gini coefficients based on intra-household sharing are much lower than those based on intra-family sharing (cf. the larger average disposable incomes in these age groups observed in Figure 15(a) for intra-household mOECD sharing compared to intra-family mOECD sharing).

We observe several comparatively large differences between the redistributive effects between disposable and final income (Figure 16(d)) obtained using the three different sharing assumptions in age groups 0–4 through 20–24. We note that whereas the contributions of in-kind benefits to final incomes are independent of the sharing assumption, the pattern of variation between the redistributive effect estimates here does not appear to be completely explained by the relative levels of average indirect taxes attributed to individuals in this age range (cf. Figure 15(b)). We remark that in general the redistributive effects resulting from taxes and benefits are sensitive to the income distribution to which they are applied, and therefore to their composition (Lambert, 1985).

Figure 16: Gini coefficients and redistributive effects under alternative sharing assumptions



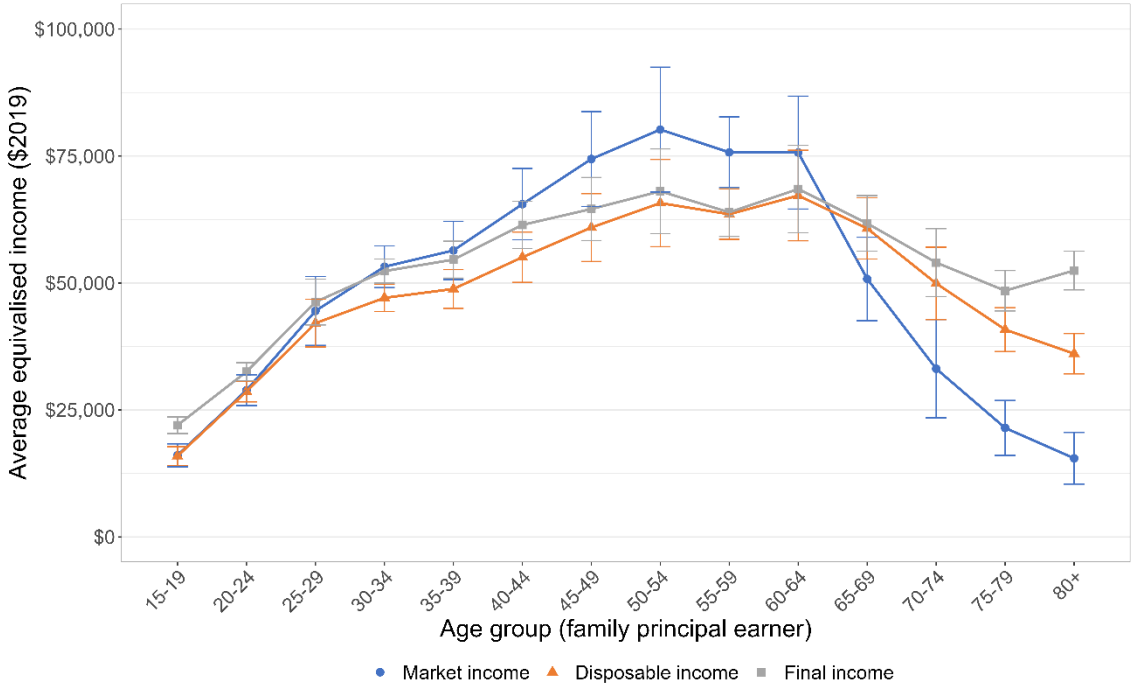
Family incomes and net fiscal impacts

We now consider the market, disposable, and final incomes of families, and the net fiscal impacts upon families due to taxes, income support payments, and in-kind benefits. We group families by the ages of their principal earners, and estimate average family incomes, Gini coefficients, and net fiscal impacts for the families in each group. These results provide an alternative characterisation of the variation of income distributions and fiscal impacts with age that does not rely upon the intra-family mOECD sharing assumption. We note, however, that to obtain final incomes and net fiscal impacts for families we must still distribute indirect taxes over the families in each household, and we follow the same approach to distributing these taxes over families as in our application of intra-family mOECD sharing.

Quantitative characterisations of the income distributions of families and households are in general sensitive to the choice of equivalence scale and unit of analysis applied (see, eg, Creedy and Sleeman, 2010; Regan and Kakoulidou, 2022). We would of course also expect our estimates to be sensitive to the choice of obtaining incomes for individuals by applying an intra-family sharing rule, as opposed to equivalising family incomes. Here, we present results for family incomes equivalised by the mOECD equivalence scale (Equation (1)), with the individual as the unit of analysis.

Figure 17 shows estimates of the average market, disposable, and final incomes of families in each of a range of family principal earner age groups. We derive these average incomes using mOECD equivalisation, with the individual as the unit of analysis.[33] The estimates for the average market incomes of families in Figure 17 are qualitatively similar to those that we presented in Figure 6 for individuals, but differ quantitatively. For example, the average market incomes for families with principal earners in the 50–54 and older age groups are somewhat larger than the corresponding estimates for individuals in the same age groups shown in Figure 6.

Figure 17: Equivalised family market, disposable, and final incomes



The estimates of average family disposable incomes in Figure 17 exhibit two features that were also seen for the average disposable incomes of individuals in Figure 6: First, the variation of average disposable incomes with age is flattened somewhat as compared to the behaviour of average market incomes. Second, average disposable incomes are lower than average market incomes in the age groups 25–29 through 60–64 and exceed average market incomes in all older age groups.

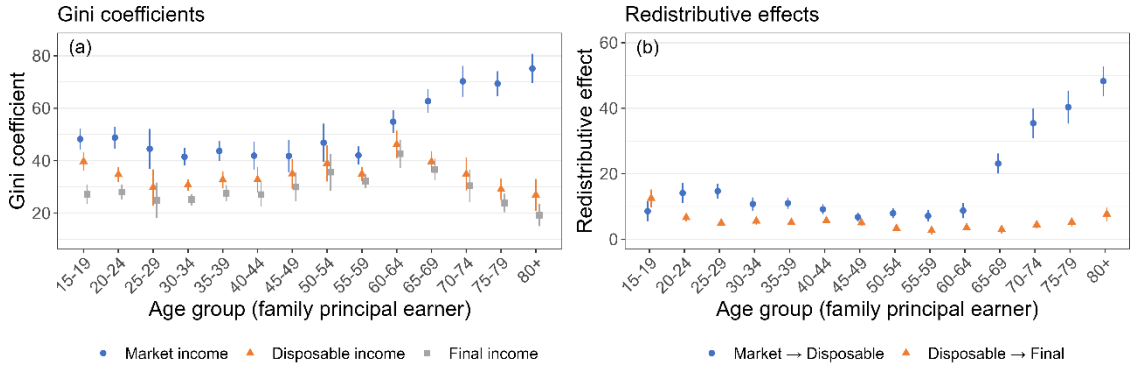
Most families in the 15–19 principal earner age group consist of single individuals (cf. Figure 10(c)), and indeed we observe that the estimates for the average values of the three income concepts in Figure 17 for this age group are similar to those shown in Figure 9(a) for individuals aged 15–19 in single member families. In particular, the average disposable income shown for families in this group in Figure 17 is almost indistinguishable from the corresponding market income estimate. This is in stark contrast to the results we presented in Figure 6 for all individuals in the 15–19 age group, which indicate an average disposable income substantially higher than the corresponding average market income, primarily due to the redistribution of disposable income from other family members to dependent children in this group by the intra-family sharing assumption (cf. Figure 4).

[33] Specifically, we calculate each family's total income, divide this amount by the mOECD equivalisation factor (Equation (1)) for the family, assign the resulting equivalised income to each family member, and average incomes over individuals in families with a principal earner in each given age group.

We recall that the estimates of average final incomes of individuals in Figure 6 are close to those of the corresponding average disposable incomes throughout the typical working years. By contrast, the average final incomes of families shown in Figure 17, which include the contributions of in-kind education (and health) expenditure on any children in these families, are somewhat higher than the average family disposable incomes for family principal age groups up to 50–54.

In Figure 18(a) we present estimates of the Gini coefficients of mOECD equivalised family market, disposable, and final incomes, for families with principal earners in each age group, using the individual as the unit of analysis.[34] Figure 18(b) shows the corresponding redistributive effects between equivalised family market and disposable incomes and between equivalised family disposable and final incomes.

Figure 18: Equivalised family income Gini coefficients and redistributive effects



The market income Gini coefficient for families with a principal earner in the 15–19 age group is much lower than that for the heterogeneous group of youth aged 15–19 shown in Figure 7(a). The variation of the Gini coefficients in Figure 18(a) with age group is otherwise qualitatively similar to that of the corresponding estimates of individual income Gini coefficients in Figure 7(a) for all three income concepts. We observe, however, that the Gini coefficients we obtain for equivalised family incomes are in most cases somewhat smaller than their counterparts based on the incomes of individuals.[35]

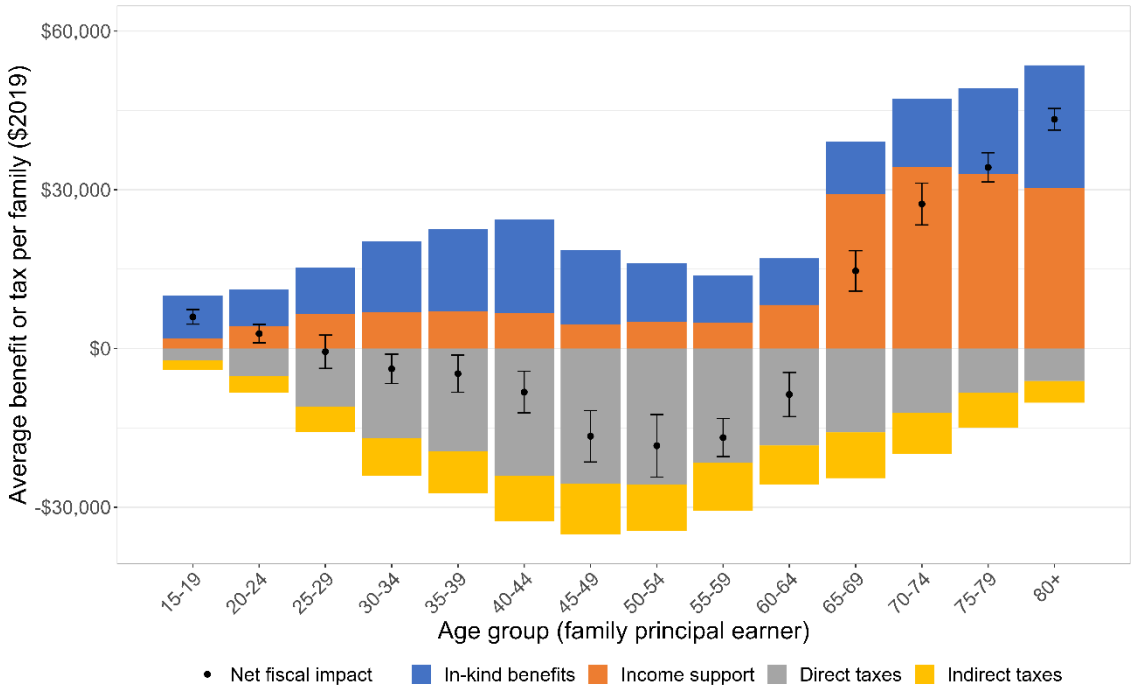
Outside of the 15–19 age group, the redistributive effects between equivalised market and disposable family incomes shown in Figure 18(b) are broadly comparable to those between market and disposable individual incomes (Figure 7(b)). The redistributive effect between equivalised family disposable and final incomes is, however, much larger than the redistributive effect between the corresponding individual incomes throughout the age groups 25–29 to 50–54 in which most principal earners of families with children are found (see Figure 10(c)). This relative enhancement of the redistributive effect for these age groups reflects the contributions of in-kind education (and health) spending on children to the final incomes of their families.

[34] We assign the equivalised income of each family to each individual in it, and then for each age group calculate the Gini coefficient of the income distribution of the individuals in those families for which the principal earner is in the group.

[35] Note that the use of the individual as the unit of analysis implies that each multi-person family's income is repeated for each of its members, producing an equalising effect, as measured by the Gini coefficient.

In Figure 19 we present the average net fiscal impacts on families with principal earners in each age group, together with estimates of the broad categories of taxation and expenditure that contribute to these net fiscal impacts. The values we present correspond in each case to the average tax or benefit amount, or net fiscal impact, per family.[36] These estimates for the four tax and benefit categories therefore represent the average taxes families in each age group pay, and the average benefits they receive.[37] It is important to note that this differs from our approach to presenting family income estimates, in which we applied mOECD equivalisation to adjust the incomes of families for their size and composition.

Figure 19: Net fiscal impact per family and its tax and benefit components



The estimates of average net fiscal impact on families in Figure 19 vary over age groups in a qualitatively similar way to the corresponding results for individuals shown in Figure 8. However, the quantities shown in Figure 19 in general differ in magnitude as compared to their counterparts in Figure 8, as the estimates here are for the total taxes paid and benefits received by families, not individuals. We note also that the in-kind education and health services expenditure that is attributed to children in Figure 8 appears in Figure 19 at the age of the principal earner of the family to which they belong, resulting in a concentration of average in-kind spending on the age groups of families with children (cf. Figure 10(c)). The behaviour of the net fiscal impact and its components for ages 65 and over is similar to that seen in Figure 8.

[36] We use the family as the unit of analysis here. That is, we average the unequivalised values of the tax and benefit components, and the net fiscal impact, for each family over all families for which the principal earner is in the given age group.

[37] The analogous results for net fiscal impacts per household by age group (cf., eg, Office for National Statistics, 2019), which we do not show here, are qualitatively similar.

IDI disclaimer

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit https://www.stats.govt.nz/integrated-data/. The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.