



## Short report

# The impact of an unconditional tax credit for families on self-rated health in adults: Further evidence from the cohort study of 6900 New Zealanders



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## ABSTRACT

It is hypothesized that unconditional (given without obligation) publicly funded financial credits more effectively improve health than conditional financial credits in high-income countries. We previously reported no discernible short-term impact of an employment-conditional tax credit for families on self-rated health (SRH) in adults in New Zealand. This study estimates the effect of an unconditional tax credit for families, called Family Tax Credit (FTC), on SRH in the same study population and setting.

A balanced panel of 6900 adults in families was extracted from seven waves (2002–2009) of the Survey of Family, Income and Employment. The exposures, eligibility for and amount of FTC, were derived by applying government eligibility and entitlement criteria. The outcome, SRH, was collected annually. Fixed effects regression analyses eliminated all time-invariant confounding and adjusted for measured time-varying confounders.

Becoming eligible for FTC was associated with a small and statistically insignificant change in SRH over the past year [effect estimate: 0.013; 95% confidence interval (CI) –0.011 to 0.037], as was an increase in the estimated amount of FTC by \$1000 (effect estimate: –0.001; 95% CI –0.006 to 0.004).

The unconditional tax credit for families had no discernible short-term impact on SRH in adults in New Zealand. It did not more effectively improve health status than an employment-conditional tax credit for families.

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## 1. Introduction

Popay (2008) hypothesizes that unconditional publicly funded financial credits more effectively improve health outcomes in disadvantaged populations in high-income countries than credits conditional on recipients adopting healthy behaviours or utilizing health services. It is argued that unconditional credits are less stigmatizing and more transformative individually and societally and do not require potentially difficult and ineffective targeting (Popay, 2008). Alternatively, unconditional and conditional cash transfers in high-income countries may be equally (in)effective at improving health outcomes, due to negligible effects of stigmatization over and above income, employment or other pathway

effects. This alternative theory may apply particularly to types of financial credits that achieve wide social acceptability such as financial credits for families and in countries that take a rights-based approach to social assistance, such as New Zealand.

We previously reported that an employment-conditional tax credit for families, called In-Work Tax Credit, had no short-term impact on self-rated health (SRH) in adults in New Zealand over seven years (Pega et al., 2013b). Our systematic review also found no evidence for any effect of the equivalent US credit, Earned Income Tax Credit, on health outcomes in adults (except mixed evidence for tobacco smoking) (Pega et al., 2013a). Therefore, employment-conditional tax credits for families may not improve health outcomes in adults over the short-run in (some) high-income countries.

We are not aware of previous empirical evidence on the impact of unconditional publicly funded financial credits on health in adults in high-income countries. However, studies from low- and middle-income countries found that unconditional financial credits

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(at maximum approximately 30% of per-capita gross national income) reduced the prevalence of HIV and herpes in young women in Malawi (Baird et al., 2012) and improved some risk factors for tuberculosis in the general population (Boccia et al., 2011). Studies of the impact of unconditional credits on health status in adults in high-income countries could provide insights for the effectiveness of these compared to conditional credits in high-income settings.

The Family Tax Credit (FTC) is an unconditional tax credit for families aiming to increase income in families at risk of poverty in New Zealand (Dalgety, 2010). Eligibility for FTC is dependent on family income, the number of dependent children in the family and family type, with larger amounts of FTC provided to one-parent families with lower family incomes and larger numbers of dependent children (Inland Revenue, 2012). FTC is generally provided to eligible families as a regular lump-sum payment through the tax system (Dalgety, 2010). The maximum amount of FTC for a family with two dependent children in 2007 was \$7252 (approximately 20% of per-capita gross national income). The New Zealand government expanded the generosity and population coverage of FTC through its Working For Families welfare reform between October 2004 and April 2007 (Dalgety, 2010), providing a natural experiment of income supplementation in a high-income country.

This health economic and political epidemiological (Pega et al., 2013c) study estimates the short-term effect of FTC on SRH in adults in New Zealand. More specifically, it answers the following research question: What is the short-term effect of becoming eligible for FTC or an increase in the amount of income from FTC by \$1000 on SRH in adults (within families) in New Zealand? This study provides the opportunity to test Popay's (2008) hypothesis that unconditional credits are more effective than conditional credits by adding to our previous study on the health effect of employment-conditional tax credits for families in adults in New Zealand (Pega et al., 2013b) comparative findings on the health effect of an unconditional tax credit for families in the same study sample and setting.

## 2. Methods

Ethical approval for this study was granted by the University of Otago Human Ethics Committee. The study used the same survey data, study sample and methods as our previous study of the employment-conditional tax credit, described in detail in our previous research report (Pega et al., 2013b). In short, we extracted seven waves (2002–2009, waves 1–7) of data from the Survey of Family, Income and Employment (data version V.2), a nationally representative panel survey of 15,000 households in New Zealand conducted by Statistics New Zealand. We restricted the survey sample to a balanced panel of potentially FTC-eligible participants, namely 6900 working-age (19–65 years) adults in one- or two-parent families over two or more consecutive waves (for a flow-chart from initial survey sample to the study sample see Fig. 1 in Pega et al. (2013b)).

The exposures of this study were eligibility for FTC and the dollar amount of FTC that the family unit was eligible for, derived from government eligibility and entitlement criteria, such as Inland Revenue Department (2007) for 2007–2008. The outcome was self-rated health, collected annually, using the following standard survey question *How would you rate your health?*, with the following five response categories with coding in brackets: *poor* (1); *moderate* (2); *good* (3); *very good* (4); and *excellent* (5). The three potential time-varying confounders were equivalised gross total annual family income (minus FTC), scaled at \$10,000; number of dependent children in the family; and family type (one-parent, two-parent).

We conducted fixed effects regression analyses to assess the association between change in the exposure and change in the outcome, controlling for all time-invariant confounding variables and adjusting for the three time-varying confounders (Wooldridge, 2002). We conducted both unadjusted (models 1) and fully adjusted (models 2) fixed effects regression analyses to estimate the association of becoming eligible for FTC and a modelled increase in the amount of FTC by \$1000 SRH with change in SRH one year later. Missing data were scarce, with no missing data at wave 1 (see Table 1). An exception was that approximately 10% of the derived family income variable missed one or more component income sources. The fixed effects regression analyses by default eliminated all observations with missing (exposure or outcome) data.

Hybrid proportional odds models (Imlach Gunasekara, 2010) were run to test whether treating SRH as categorical (rather than linear) produced different results than the main analyses. A second sensitivity analysis examined the effect of lagging the outcome behind the exposure by longer time periods (2–5 years). A third sensitivity analysis (partially) tested the effect of missing income data by excluding participants with any missing component income source from the analysis. A fourth sensitivity analysis investigated effect modification by level of family income by including interaction terms in the models.

## 3. Results

Table 1 presents sample characteristics by FTC eligibility and FTC eligible amount at wave 1 baseline. A total of 16.5% of participants were eligible and 68.1% were ineligible for FTC. (Note that 15.4% of participants were not in a family and thus neither eligible nor ineligible, but were included in the sample due to being in a family in subsequent waves.) The mean FTC eligible amount over 1 year was \$2963 [SD \$1914] and the median was \$2452.

The change in the exposures and outcome over time was considerable. Between wave<sub>t</sub> and wave<sub>t+1</sub>, 5.8% of participants became eligible and 4.8% became ineligible for FTC, as well as 9.6% increased and 8.9% decreased the amount of FTC that they were eligible for by at least one quintile of FTC. Also 19.6% of participants increased and 22.4% decreased their SRH score by at least one.

Table 2 presents the results of the fixed effects regression analysis for the exposures of (1) FTC eligibility and (2) FTC eligible amount, unadjusted (model 1) and fully adjusted for the three time-varying confounders (model 2). Becoming FTC-eligible was associated with a small and statistically insignificant change in SRH over the past year [ $\beta$  0.013, 95% confidence interval (CI) –0.010 to 0.035; adjusted  $\beta$  0.013, CI –0.011 to 0.037]. Similarly, an increase in the amount of FTC that a family was eligible for by \$1000 was also associated with no discernible change in SRH ( $\beta$  –0.001, 95% CI –0.005 to 0.004; adjusted  $\beta$  –0.001, 95% CI –0.006 to 0.004). The unadjusted and adjusted effect estimates were near identical for both exposure variables, suggesting no confounding by any of the measured time-varying confounders. Sensitivity analyses (available from authors on request) produced comparable results to the main analyses when treating the exposure as categorical in hybrid proportional odds models (Imlach Gunasekara, 2010); lagging the outcome variable behind the outcome variable by 2–5 years; and excluding participants with any missing component income source (a partial test of selection bias from missing income). Furthermore, no effect measure modification by level of family income was found.

## 4. Discussion

This study estimated the short-term impact of FTC, an unconditional tax credit for families, on SRH in adults in New Zealand,

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