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Ethnicity and Pathways to Welfare Dependence in a New Zealand Birth Cohort

Introduction

The provision of welfare has long been an issue that has attracted extensive debate.¹ Familiar themes that perennially feature in this debate involve determining who is responsible for providing economic and social security to citizens; in what form and to what extent should provision be made available; what criteria and terms should be employed to determine welfare eligibility; and whether the provision of welfare helps or hinders an individual's pursuit of purpose and independence (Allen and Scruggs, 2004). Although philosophies of welfare and the practical support provided vary across a range of advanced industrial societies, common to all is the attempt to find a mutually agreeable balance between recognising the responsibilities of the state and providing viable support to citizens (Bane and Elwood, 1994; Herd, 2005). An important issue to emerge, however, is the problem of welfare dependency and its long-term consequences to individuals, their families and, more broadly, to a nation's social capital.

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A substantial body of empirical evidence now suggests that ongoing reliance on welfare support can have a potentially corrosive impact on childhood and family outcomes and, further, that it is associated with the limiting of opportunities across the life span (Serbin and Karp, 2004). Just as concerning is the evidence for a link between the intergenerational transmission of welfare dependency (Antel, 1992) and the development of structural or concentrated poverty (Putallaz, Costanzo, Grimes and Sherman, 1998). In view of these findings, researchers have continued to direct attention toward ascertaining the factors that may lead or have led to welfare dependence in the hope that by doing so they may also identify plausible intervention points and exit routes out of welfare.

New Zealand's modern welfare state came into being with the Social Security Act of 1938 (Castles, 1985). In line with other nations and concurrent with the shift towards a globalised economy, New Zealand's welfare system was reformed during the latter part of the 20th century (Mackay, 1998). Although it retains its central characteristics of being funded through general taxation and covering a range of circumstances and contingencies, notable changes were also implemented (Boston, 1999). These changes included benefits becoming simplified and directed toward those with the greatest need; the expansion of private arrangements for social security; and more stress being placed on individual self-sufficiency (Mackay, 2003).

While New Zealand's system of social security is often lauded for its emphasis on providing universal support (Rudd, 1997), one of its conspicuous, yet downplayed, features is the early emphasis that was directed toward providing welfare assistance to Māori. New Zealand was one of the first nations to remove ethnic biases relative to welfare eligibility. In 1945 the New Zealand government passed the Māori Social and Economic Advancement Act, and, in the following year, implemented the universal family benefit whereby Māori were equally entitled to benefit receipt as non-Māori (Labrum, 2004). In recent years, however, it has been well documented that Māori have higher rates of welfare dependence than non-Māori (Ministry of Social Development, 2009). This over-representation holds across all main benefits, but is particularly stark relative to the unemployment and the domestic purposes benefits (DPB) (Ministry of Social Development, 2010a). Currently, Māori comprise around 15% of the New Zealand population.² According to official statistics describing the rate of all working-aged adults in receipt of unemployment benefits, at the end of March 2010, 33.3% of recipients were Māori (Ministry of Social Development, 2010b). At the same time approximately 110,000 adults were in receipt of the DPB, of whom it was estimated 41.6% were Māori (Ministry of Social Development, 2010c). It is figures such as these that have generated both widespread concern and calls for levels of welfare dependence to be reduced amongst Māori (see New Zealand Institute of Economic Research, 2003).

While Māori being over-represented as welfare beneficiaries has led to much public and political discussion, less is known about the risk factors and life processes that place Māori at greater risk of poverty and welfare dependence. One prominent explanation attributes it to being another adverse consequence for Māori of the organised colonial settlement of New Zealand (Robson, 2004). However, it could be argued that a more plausible explanation is that the over-representation of Māori among those receiving welfare benefits may arise via several diverse pathways, with each having different implications for social policy (Chapple, 2000).

One potential pathway that may place Māori at greater risk of welfare dependence is family instability and dysfunction. It has been well documented that Māori are at greater risk than non-Māori of being exposed to family instability and dysfunction (e.g. Marie, Fergusson and Boden, 2008a), and evidence suggests that these factors contribute to increased

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risks of adverse outcomes later in life (Forehand, Biggar and Kotchik, 1998). A second set of factors that may increase risks of welfare dependence amongst Māori relates to the higher rates of personal adjustment problems experienced by Māori. These problems include being more likely to engage in substance misuse, and also being more likely to experience behavioural problems and mental health difficulties (Fergusson, 2003). It may be that these problems of adjustment contribute to welfare dependence by decreasing individual capacity to participate effectively or consistently in the work force.

An additional factor that may contribute to the ethnic differential in welfare dependence involves education. One of the most well-established features of New Zealand's education system is the enduring disparity in educational achievement between Māori and non-Māori (Marie, Fergusson and Boden, 2008b). Given the recognised contribution of education to improved life opportunities, it may be proposed that the lower levels of educational achievement amongst Māori limit the range of occupations available to them and therefore expose Māori to a higher risk of welfare dependence.

It also seems likely that the higher rates of welfare dependence among Māori may be attributed, in part at least, to their higher rates of early parenthood (Statistics New Zealand, 2004). Early parenting has been associated with increased risks of poverty, single parenthood and the breakdown of two-parent families (Robson and Berthoud, 2006). Therefore, the earlier age of parenthood may contribute to the higher level of welfare receipt amongst Māori.

While it is likely that the higher rates of welfare dependence amongst Māori will involve some or all of the factors reviewed, each of these factors leads to a different policy perspective regarding the causes of, and responses to, that welfare dependence. The personal adjustment perspective, for example, implies that a major pathway for reducing welfare dependence amongst Māori may be through the development of policies which address ethnic differentials in substance misuse and behavioural disorders. The explanation regarding education implies that the major pathway is through improving the overall educational achievement level of this ethnic group. Finally,

A measure of family adversity was calculated using a count of 38 different measures of family disadvantage during the period 0–15 years ...

encouraging the deferral of early parenthood may also present a major pathway to reducing welfare dependence of Māori, and in the process enhance the educational prospects of members of this group. For purposes of clarity, it is therefore important to understand the relative contributions that family dysfunction, personal adjustment factors, educational achievement and early parenthood make to current ethnic differentials in rates of welfare dependence in New Zealand.

Against this background, this paper examines the factors associated with the development of welfare dependence in a birth cohort of Christchurch-born children who have been studied to the age of 30. The aims of this study were:

- 1) To document ethnic disparities in rates of welfare dependence in a birth cohort of young adults aged 21–30.
- 2) To examine the extent to which ethnic disparities in exposure to family dysfunction, personal adjustment, educational achievement and early parenthood may mediate links between ethnicity and welfare dependence.

Methods

The data were gathered during the course of the Christchurch Health and Development Study (CHDS). In this study a birth cohort of 1,265 children (635 males, 630 females) born in the Christchurch (New Zealand) urban region in mid-1977 has been studied at birth, 4 months, 1 year and annually to age 16 years, and again at ages 18, 21, 25 and 30 (Fergusson and Horwood, 2001; Fergusson et al., 1989). The analyses reported here were based on those study participants for whom information was available concerning: (a) ethnic identity at age 21; (b) welfare dependence during the ages 21–25; and (c) welfare dependence during ages 25–30. Sample sizes ranged between 963 and 978 participants (76%–77% of the original sample). All study information was collected on the basis of signed and informed consent from study participants.

Welfare dependence, ages 21–25 and 25–30

Dependence on three different categories of welfare benefit (unemployment benefit, sickness/invalid's benefit and DPB), and overall welfare benefit dependence was assessed in the following manner. At ages 25 and 30, cohort members were questioned as to their receipt of welfare benefits during each year of the assessment period from age 21 to 25, and during the assessment period from age 25 to 30. Participants were asked to indicate the number of months they had received one of the three classes of benefit (unemployment; sickness/invalid's; DPB) during each year (or during the period for ages 25–30), and whether they were currently receiving any of the three classes of benefit. For the purposes of the present investigation, those individuals who reported receiving a particular benefit for at least one month during the assessment period were classified using a dichotomous measure as having received that benefit. In addition, participants who reported receiving any benefit for at least one month during the assessment period were classified as having been welfare dependent during that period.

Furthermore, the number of months that each cohort member reported being on a welfare benefit were summed across all benefits and the assessment period to arrive at a measure of the total number of months spent on benefit by each participant.

Ethnicity

At age 21 years respondents were asked about their ancestry, ethnic and cultural identification, level of participation in Māori cultural domains, and proficiency in the Māori language (Broughton et al., 2000). As part of this questioning, participants were asked to indicate which ethnic groups they 'belonged to' or 'identified with'. For the purposes of the present investigation, all participants who chose 'New Zealand Māori' as a response option (whether alone, or in combination with one or more other options) were classified as Māori (11.1% of the sample).

Childhood, family and individual confounding and intervening factors

In order to examine the links between ethnicity and exposure to adverse, potentially confounding, or intervening childhood, family and individual factors, a number of measures were drawn from the database of the study. Measures which were found to be unrelated to either ethnicity or welfare dependence at ages 21–25, or that were not found to be statistically significant mediating factors, were eliminated from further analyses and will not be described here. The measures retained included:

Family socio-economic status

Several measures of family socio-economic status were chosen from the study database and included as potential confounding factors. These measures included:

Maternal age. The mother's age was recorded at the birth of each cohort member.

Maternal education. Maternal education levels were assessed at the time of the survey child's birth using a three-point scale which reflected the highest level of educational achievement attained. This scale was: 1 = the mother lacked formal educational qualifications (had not graduated from high school); 2 = mother had secondary-level educational qualifications (had graduated from high school); 3 = mother had tertiary-level qualifications (had obtained a university degree or equivalent qualification).

Family living standards (0–10 years). At each year a global assessment of the material living standards of the family was obtained by means of an interviewer rating. Ratings were made on a five-point scale that ranged from 'very good' to 'very poor'. These ratings were summed over the ten-year period and divided by 10 to give a measure of typical family living standards during this period.

Family socio-economic status (at birth). This was assessed at the time of the survey child's birth using the Elley-Irving (Elley and Irving, 1976) scale of socio-economic status for New Zealand. This scale classifies socio-economic status into six levels on the basis of paternal occupation ranging from 1 = professional occupations to 6 = unskilled occupations.

Average family income, ages 0–10. At each year estimates of the family's gross annual income were obtained from parental report. To provide a measure of the average level of income available to each family over the period from the child's birth to age 10 the income estimates for each year were first recoded into decile categories, and the resulting measures then averaged over the ten-year period to produce a measure of the family's averaged income decile rank.

Family functioning

A measure of family functioning was also chosen from the study database: family adversity. A measure of family adversity was calculated using a count of 38 different measures of family disadvantage during the period 0–15 years, including measures of disadvantaged parental background, poor pre-natal health practices and perinatal outcomes, and disadvantageous child-rearing practices (Fergusson, Horwood and Lynskey, 1994).

Behavioural issues and substance use disorders (ages 15–21)

Measures of mental health and substance use disorders from age 16 to age 21 included:

Conduct problems (ages 14–16). At ages 15 and 16, sample members and their mothers were interviewed regarding behavioural issues, with information obtained on DSM-III-R (American Psychiatric Association, 1987) symptom criteria for disruptive childhood behaviours, including symptoms of conduct disorder (CD). For child self-report CD was assessed using the Self-Report Early Delinquency (SRED) scale (Moffitt and Silva, 1988). For parental reports CD was assessed using a parent version of the SRED. For the purposes of the present investigation, responses on these measures were adapted into

a continuous scale measure reflecting the number of symptom criteria reported by either the child or the parent.

Alcohol abuse/dependence (ages 15–21). At age 16 items from the DISC (Costello et al., 1982) were used to assess DSM-III-R symptom criteria for alcohol abuse/dependence. From age 18 onwards these disorders were assessed using CIDI (World Health Organization, 1993) items and DSM-IV (American Psychiatric Association, 1994). Individuals who met the relevant DSM diagnostic criteria for alcohol abuse/dependence in one of the assessment periods were classified as having alcohol abuse/dependence.

In all cases, the associations between ethnicity and receipt of welfare benefits remained statistically significant after adjustment for potentially confounding measures of childhood socio-economic status ...

Individual factors

Individual factors included:

Leaving school without qualifications (by age 18). At age 18 participants were assessed on their educational achievement to date. Those participants who reported attaining no formal secondary educational qualifications (a minimum of one grade above C on School Certificate examinations) were classified as having left school without qualifications by age 18.

Parent by age 21. At each assessment from age 15 to age 21 cohort members were asked whether they had become pregnant or caused a partner to become pregnant since the previous assessment, and were questioned as to the outcome of the pregnancy. Those cohort members who reported that a pregnancy had resulted in a live birth were classified as having become parents prior to age 21.

Statistical analyses

All analyses were conducted using Stata 10.0 (StataCorp, 2007). The associations between ethnicity and the repeated measures of welfare dependence during the periods of age 21–25 years and 25–30 years were estimated by fitting repeated measures logistic regression models to the data, of the form:

$$\text{Logit}(Y_{it}) = B_0 + B_1X_i + B_2t \quad (\text{EQ1})$$

where Y_{it} was the log odds of each welfare dependence outcome (unemployment; sickness/invalid; DPB; overall welfare dependence) for the i -th individual at time t (where $t = 21$ –25 years and 25–30 years); X_i represented ethnicity (Māori/non-Māori); and t was a dichotomous variable representing period of assessment, which was included in the model to allow for changes in the rate of welfare dependence with age. In each case estimates of the population-averaged odds ratio (OR) and 95% confidence

interval (CI) between ethnicity and each outcome pooled over the two observation periods were obtained from the fitted model parameter (B₁) in the usual manner ($e^{B_1} \pm 1.96SE(B_1)$).

In order to adjust the associations between ethnicity and the repeated measures of welfare dependence for potentially confounding socio-economic factors, the models presented above were extended to include confounding factors. These models were of the form:

$$\text{Logit}(Y_{it}) = B_0 + B_1X_i + B_2t + \sum B_jZ_{ij} \quad (\text{EQ}_2)$$

where $\sum B_jZ_{ij}$ represented the effects of the set of confounding socio-economic factors on each welfare dependence outcome. Confounding factors were entered into the equations simultaneously.

Then, in order to examine the extent to which potentially intervening factors mediated the associations between ethnicity and welfare dependence, the models specified by equation 2 (above) were extended to include a set of intervening factors. This model was of the form:

$$\text{Logit}(Y_{it}) = B_0 + B_1X_i + B_2t + \sum B_jZ_{ij} + \sum B_kZ_{ik} \quad (\text{EQ}_3)$$

where $\sum B_kZ_{ik}$ represented the effects of the set of intervening factors on each welfare dependence outcome. Intervening factors were entered into the equations using methods of both forwards and backwards variable elimination to identify a stable model for each outcome. Each intervening factor was then tested for mediation by using a Sobel test procedure on Stata 10.0, which employed a weighted-least squares analysis with bootstrapping. Using this procedure, potentially intervening factors that were not found to be significant mediating factors were excluded from further analyses. The parameter estimates from the final repeated measures logistic regression models (including mediating factors) were used to derive estimates of the OR and 95% CI for the associations between ethnicity and welfare dependence outcomes.

Results

Associations between ethnicity and welfare dependence, ages 21–30

Table 1 shows the rates of welfare dependence across each class of benefit, and overall, for non-Māori and Māori cohort members during the periods of ages 21–25 years, 25–30 years, and overall from ages 21 to 30 years. The table also reports on the mean number of person-months spent on benefit during the period 21–30 years for both non-Māori and Māori cohort members. In addition, the table shows estimates of the pooled odds ratio (OR) and 95% CI for the associations between ethnicity and each class of welfare benefit. These were obtained by fitting population-averaged logistic regression models that predicted welfare dependence as a function of ethnicity and time period (see Methods above). The table shows:

- 1 Across all categories of welfare benefit, and in overall welfare dependence, Māori cohort members were at significantly ($p < .05$) increased risk of welfare dependence during the age period 21–30 years as compared with non-Māori. The pooled OR estimates showed that Māori cohort members had odds of welfare dependence that ranged from 1.62 to

3.73 times higher than non-Māori cohort members. Overall, Māori had odds of any type of welfare dependence that were 2.51 times that of non-Māori.

- 2 In addition, Māori cohort members reported spending significantly ($p < .0001$) longer periods of time on welfare benefits than non-Māori cohort members during the period 21–30 years. On average, Māori cohort members spent more than 12 months longer on welfare than non-Māori cohort members during that period.

In all cases, the associations between ethnicity and receipt of welfare benefits remained statistically significant after adjustment for potentially confounding measures of childhood socio-economic status, with adjusted odds ratios ranging from 1.54 to 1.88.

Table 1: Associations between ethnicity and welfare dependence, ages 21–25, 25–30 and overall

Welfare dependence ages	Ethnicity		Pooled OR	95% CI	p
	Non-Māori	Māori			
% reporting unemployment benefit					
Ages 21–25	23.3	31.8			
Ages 25–30	4.9	9.5		1.08-	
Overall	24.8	33.9	1.62	2.43	<.05
% reporting sickness/invalid benefit					
Ages 21–25	6.0	12.7			
Ages 25–30	5.7	8.6		1.10-	
Overall	9.1	16.1	1.92	3.35	<.05
% reporting DPB					
Ages 21–25	5.4	19.1			
Ages 25–30	4.9	13.3		2.23-	
Overall	7.3	22.3	3.73	6.23	<.0001
% reporting any benefit					
Ages 21–25	31.3	54.5			
Ages 25–30	14.3	27.6		1.77-	
Overall	34.7	58.9	2.51	3.57	<.0001
Mean (SD) person – months spent on benefit, ages 21–30					
	8.50 (21.63)	20.95 (31.29)	--	--	<.0001
N					
Ages 21–25	868	110			
Ages 25–30	858	105			

Associations between ethnicity and intervening factors (to age 21)

In order to examine potential intervening pathways that may place Māori at greater risk of later welfare dependence, the associations between ethnicity and a range of potentially intervening family and individual background factors were examined. These factors included family functioning, behavioural issues and substance use, and life circumstances including education and early parenthood, each of which was significantly ($p < .05$) correlated with at least one welfare dependence outcome (see Methods). The results of these analyses are reported in Table 2, which shows the

associations between ethnicity and: exposure to family adversity; conduct problems; alcohol abuse/dependence; early parenthood; educational achievement. Tests of significance are given by the chi-square test of independence for dichotomous variables, and the t-test for independent samples for continuous measures. The table shows that:

- 1 Māori were significantly ($p < .0001$) more likely to have had exposure to a range of adverse family circumstances than non-Māori. These results suggest that Māori cohort members were at increased risk of exposure to family instability and dysfunction associated with later welfare dependence than non-Māori.
- 2 Māori were at significantly greater risk of conduct problems ($p < .0001$) in mid-adolescence, and alcohol abuse/dependence ($p < .001$) during the age period 15–21 than non-Māori. These results suggest that Māori cohort members were at increased risk of behaviour disorders and alcohol use disorders associated with later welfare dependence than non-Māori.
- 3 Māori were significantly ($p < .0001$) more likely to have become parents by age 21, and were significantly ($p < .0001$) less likely to have completed secondary educational qualifications. These results suggest that Māori cohort members were at increased risk of experiencing life circumstances that were associated with later welfare dependence than non-Māori.

Table 2: Associations between ethnicity and intervening factors, to age 21

Intervening Factor	Ethnicity		p ¹
	Non-Māori	Māori	
Family Functioning			
Mean (SD) family adversity score	6.63 (4.91)	11.55 (6.20)	<.0001
Mental health and substance use			
Mean (SD) conduct problems score, ages 14–16	0.65 (1.27)	1.71 (2.43)	<.0001
% alcohol abuse/dependence, ages 15–21	35.9	53.5	<.001
Life circumstances			
% became a parent by age 21	12.2	39.5	<.0001
% left school without formal qualifications	16.8	30.9	<.0001

¹ Chi-square test for percentage measures; t-test for continuous measures

Associations between ethnicity and welfare dependence, ages 21–30, after adjustment for covariate factors

The findings presented in Tables 1 and 2 raise the possibility that the increased rates of welfare dependence in early adulthood amongst Māori cohort members may be mediated via higher levels of exposure to adverse circumstances in childhood and adolescence. This proposition was examined by extending the repeated measures logistic regression models in Table 1 to include the range of potentially intervening factors included in

Table 2 (see Methods). The results of these analyses are presented in Table 3, which shows estimates of the odds ratio and 95% CI for the associations between ethnicity and welfare dependence, adjusted for the range of intervening factors described in Table 2. The table also reports on statistically significant ($p < .05$) mediating factors for the link between ethnicity and each welfare dependence outcome. The table shows that:

- 1 After adjustment for potentially mediating factors, the associations between ethnicity and unemployment benefit were reduced to statistical non-significance ($p > .20$). Sobel tests of mediation suggest that both conduct problems at ages 14–16 and alcohol abuse/dependence during ages 15–21 were statistically significant ($p < .05$) mediating factors in the link between ethnicity and unemployment benefit.
- 2 Adjustment of potentially mediating factors also reduced the associations between ethnicity and sickness/invalid benefit to statistical non-significance ($p > .50$). Statistically significant ($p < .05$) mediating factors included exposure to family adversity, and alcohol abuse/dependence during the ages 15–21.
- 3 Similarly, adjustment for potentially mediating factors reduced the associations between ethnicity and DPB receipt to statistical non-significance ($p > .80$). Statistically significant ($p < .05$) mediating factors included exposure to family adversity, and becoming a parent by age 21.
- 4 Finally, adjustment for mediating factors reduced the associations between ethnicity and overall welfare dependence to statistical non-significance ($p > .10$). Statistically significant ($p < .05$) mediating factors included: exposure to family adversity, alcohol abuse/dependence during ages 15–21, early parenthood, and leaving school without formal educational qualifications.

Table 3: Adjusted odds ratios for the associations between ethnicity and welfare dependence, ages 21–30, and statistically significant ($p < .05$) intervening factors

Welfare dependence ages 21–30	OR	95% CI	p	Statistically significant ($p < .05$) intervening factors
Unemployment benefit	1.30	0.84-2.01	>.20	Conduct problems ages 14–16 Alcohol abuse/dependence ages 15–21
Sickness/invalid benefit	1.23	0.66-2.26	>.50	Family adversity Alcohol abuse/dependence ages 15–21
DPB	1.08	0.59-1.95	>.80	Family adversity Becoming a parent by age 21
Any welfare benefit	1.37	0.92-2.03	>.10	Family adversity Alcohol abuse/dependence ages 15–21 Leaving school without qualifications Becoming a parent by age 21

Supplementary analyses

In addition to the above analyses, the Māori cohort members were further classified into two groups representing degrees of cultural identity (sole Māori; Māori/other cultural identity) as in previous analyses of the present cohort (Marie et al., 2008a; Marie et al., 2008b). The analyses described above were then repeated using the three-group classification scheme (sole Māori; Māori/other cultural identity; non-Māori) in place of the two-group ethnicity measure. However, the analyses did not reveal any statistically significant differences between Māori cultural identity groups on any of the welfare dependence outcome measures, suggesting that variations in Māori cultural identity were not linked to welfare dependence outcomes.

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Discussion

In this study we have used data gathered over the course of a 30-year longitudinal study, the Christchurch Health and Development Study, to investigate the issue of welfare receipt and dependency. A specific focus has been the examination of a range of factors that may contribute to the current over-representation of Māori in receiving social security benefits when compared to other New Zealanders. We now discuss in more detail the key findings and their implications.

Irrespective of benefit type, Māori respondents were more likely to be welfare recipients than non-Māori cohort members, with rates of welfare dependence that ranged from 1.62 to 3.73 times those of non-Māori. In addition, Māori spent on average 12.45 months longer on welfare than non-Māori during the age period 21–25. These findings are in general agreement with previous data showing that Māori were more likely to be in receipt of social welfare benefits (Statistics New Zealand, 2002; Ministry of Social Development, 2009). In addition, the analyses showed that these associations persisted after controlling for potentially confounding family socio-economic factors.

Previous research on Māori over-representation in social welfare benefit receipt has suggested a range of possible explanations for these observed ethnic disparities (Chapple, 1999, 2000). However, a strength of the present study was the use of prospective data that allowed the examination of the mediating pathways by which young Māori were at increased risk of benefit reliance. The results of these analyses showed

that Māori cohort members had increased rates of exposure to a range of adverse circumstances in childhood, adolescence and early adulthood, which were in turn associated with increased levels of welfare benefit receipt. Analyses of the links between ethnicity and welfare dependence, accounting for possible intervening pathways by which Māori may be placed at greater risk of welfare benefit receipt, showed that the statistically significant associations between ethnicity and each class of welfare benefit were mediated by a series of factors related to: family instability and dysfunction; behaviour disorders and substance use disorders; and life circumstances related to early parenthood and educational outcomes. In general, the analyses of the intervening pathways in the links between ethnicity and benefit receipt are congruent with previous research which suggests that the risks of welfare dependence in adulthood are increased by early signs of adjustment difficulties, including: behaviour and adjustment problems; exposure to higher levels of family stress and dysfunction; failure to complete educational qualifications; and early parenthood (e.g. Boden, Fergusson and Horwood, 2008).

The results of the present analyses also showed that the links between ethnicity and receipt of each class of benefit were associated with a different pattern of intervening factors, suggesting that the risk of receipt of a particular class of benefit in adulthood was increased via specific developmental trajectories. For example, the links between ethnicity and unemployment benefit receipt were mediated via alcohol abuse/dependence during the ages of 15–21, and conduct problems during ages 14–16. This is in general agreement with findings that suggest that personal adjustment and behaviour problems in adolescence are a risk factor for adult unemployment (Brook and Newcomb, 1995), in that long-term disruptive behaviour compromises the individual's ability to participate effectively in the workforce. Similarly, the present study found that links between ethnicity and later DPB receipt were mediated via early parenthood and exposure to family adversity. Previous research suggests that family adversity in childhood is a strong indicator of later social welfare benefit receipt, while early parenthood is associated with increased risks of poverty, single parenthood and the breakdown of two-parent families (Robson and Berthoud, 2006).

The results reported here suggest that the over-representation of Māori in welfare statistics is best understood as an outcome of greater exposure to a multitude of adverse influences beginning in childhood. It is therefore not Māori ethnicity *per se* which leads to welfare dependence, but rather the increased likelihood that individuals affiliated to this group will have much higher exposure to risk factors associated with adversity throughout the life course and into adulthood. The ecological 'at risk' model of familial adversity provides a suitable explanatory framework to interpret these results in more detail (Repetti, Taylor and Seeman, 2002). In basic form, stressful

environments characterised by, for example, a lack of support or accessible emotional and material resources are more likely to have negative consequences for individuals who are raised in them. These 'environmental insults', which might include adverse child experiences and stressful life events, can have an accumulative effect and influence vulnerability dispositions as well as healthy development and functioning. The over-representation of Māori amongst those receiving social security in adulthood may therefore be a negative outcome of a pattern of adversity more likely to be experienced by Māori beginning in childhood.

The fact that the links between each particular class of benefit and ethnicity had a distinct pattern of intervening pathways further suggests that the life course pathways leading to welfare dependence are multifarious, and also suggests that attempts at reducing ethnic differences in welfare dependence should not be targeted at a single factor, but rather should be aimed at the broader range of factors that lead to increased risk of welfare dependence, such as those shown in the present study. Importantly, the results suggest that interventions and programmes that target a single specific driver of welfare dependence (such as early parenthood) may achieve only modest results. The results of this study imply that ethnic disparities in

welfare dependence may be best addressed by a comprehensive range of policies aimed at reducing exposure to socio-economic adversity, addressing causes of family dysfunction, providing assistance and treatment for mental health and substance use disorders, improving educational outcomes, and discouraging early parenthood.

It should be noted that the findings reported are based on a particular birth cohort born in a specific place and at a particular time. The extent to which these findings can be generalised to other cohorts of New Zealanders is therefore open to debate and awaits further research. In addition, the research reported here is subject to the usual limitations of reporting and other errors in data provided by survey methods. Also, it should be noted that the assessment of ethnicity in the CHDS cohort differs from the measurement of ethnicity in administrative data sources such as that of Statistics New Zealand, which may raise issues in terms of the interpretation of the present findings.

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- 1 The research on which this paper is based was funded by grants from the Health Research Council of New Zealand, the National Child Health Research Foundation, the Canterbury Medical Research Foundation and the New Zealand Lottery Grants Board.
 - 2 The estimate of 15% is based on Level 1 of the ethnicity classifications used by Statistics New Zealand (in which individuals are classified as a member of a single group as follows: European; Māori; Pacific Peoples; Asian; Middle Eastern/Latin American/African; Miscellaneous).

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