

Government social assistance programmes are failing to protect the health of low-income populations: evidence from the USA and Canada (2003–2014)

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ABSTRACT

Background Social policies that improve the availability and distribution of key socioeconomic resources such as income, wealth and employment are believed to present the most promising avenue for reducing health inequalities. The present study aims to estimate the effect of social assistance reciprocity on the health of low-income earners in the USA and Canada.

Methods Drawing on nationally representative survey data (National Health Interview Survey and the Canadian Community Health Survey), we employed propensity score matching to match recipients of social assistance to comparable sets of non-recipient 'controls'. Using a variety of matching algorithms, we estimated the treatment effect of social assistance reciprocity on self-rated health, chronic conditions, hypertension, obesity, smoking, binge drinking and physical inactivity.

Results After accounting for underlying differences in the demographic and socioeconomic characteristics of recipients and non-recipients, we found that social assistance reciprocity was associated with worse health status or, at best, the absence of a clear health advantage. This finding was consistent across several different matching strategies and a diverse range of health outcomes.

Conclusions From a public health perspective, our findings suggest that interventions are warranted to improve the scope and generosity of existing social assistance programmes. This may include reversing welfare reforms implemented over the past several decades, increasing benefit levels and untethering benefit reciprocity from stringent work conditionalities.

INTRODUCTION

An extensive body of social epidemiological evidence suggests that health inequalities are largely attributable to inequalities in the distribution of key socioeconomic resources such as income, wealth and employment.^{1–2} Accordingly, social policies that address the problem of socioeconomic disadvantage are believed to present the most promising avenue for reducing health inequalities.^{3,4} Social assistance programmes are a principal mechanism by which governments aim to reduce the extent of socioeconomic disadvantage in society. These programmes are designed to provide a modest level of financial assistance to low-income populations. To the extent that they are successful at promoting income security among society's most vulnerable members, they

are predicted to contribute to overall population health and health equity.^{5,6}

While public health theory would predict that social assistance programmes are beneficial for the health of the income-insecure, extant studies in this area of research suggest that social assistance reciprocity is associated with adverse health outcomes.^{7–15} However, due to a reliance on descriptive methods that are ill equipped to account for selection bias, it is difficult to ascertain whether the negative association reported in these studies is a direct consequence of social assistance or instead reflects a priori differences in the underlying characteristics of recipients and non-recipients. A key challenge in this respect is the need to separate out true programme effects from the potential confounding effects of these underlying differences.¹⁶ To address this challenge, scholars can exploit a range of techniques that are specifically designed to reduce the risk of confounding. These include such techniques as propensity score matching and synthetic control which, in the absence of an experiment, enable the construction of well-matched 'treatment' and 'control' groups using observational data.^{17–19} Despite their widespread availability, prior work on the health effects of social assistance programmes has neglected to take advantage of these techniques.

In the present study, we employ propensity score matching to investigate the extent to which current social assistance programmes are succeeding at protecting the health of the most income-insecure in the USA and Canada—peer nations with similarly designed social assistance systems. Specifically, we matched recipients of social assistance to comparable sets of non-recipient 'controls' with the aim of estimating the effect of social assistance reciprocity on a range of health outcomes.

METHODS

Data and sample

Data were obtained from the National Health Interview Survey (NHIS) and the Canadian Community Health Survey (CCHS), the largest nationally representative repeated cross-sectional surveys with information on both health status and social assistance in the USA and Canada, respectively. We pooled survey cycles covering the period from 2003 to 2014. Our sample included individuals 18 to 64 years old, in the lowest decile of household income and active in the labour market (ie, either employed or unemployed and actively seeking work). By



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Table 1 Demographic and socioeconomic characteristics of the unmatched analytic samples

	USA (NHIS 2003–2014)				Canada (CCHS 2003–2014)			
	Employed		Unemployed		Employed		Unemployed	
	Recipients	Non-recipients	Recipients	Non-recipients	Recipients	Non-recipients	Recipients	Non-recipients
	n=1026	n=14561	n=609	n=3625	n=1746	n=8279	n=1556	n=1021
Age (years)	32.6	34.3	31.8	34.8	39.7	39.6	38.9	37.8
Female (%)	73.7	56.4	72.7	54.7	63.9	57.0	51.2	54.3
Household type (%)								
Single	7.7	36.3	12.3	36.0	45.9	35.6	51.0	40.2
Couple	3.9	11.5	5.1	16.6	5.8	12.5	6.4	10.4
Single with children	49.8	21.4	48.4	20.0	34.3	18.0	29.8	21.2
Couple with children	38.6	30.7	34.2	27.4	14.0	33.8	12.8	28.3
Number of children (0–18 years)	1.94	1.15	1.83	0.94				
Number of children (0–5 years)					0.302	0.278	0.290	0.215
Number of children (6–11 years)					0.346	0.331	0.276	0.214
Race (%)								
White	27.0	38.4	21.2	34.3	78.8	74.2	74.1	68.1
Black†	29.9	20.0	44.0	31.8				
Aboriginal	1.4	0.8	1.4	0.8	12.0	5.6	13.2	7.9
Asian†	2.8	4.1	2.0	4.7				
Hispanic†	0.3	0.6	1.1	0.4				
Other or mixed	30.2	28.1	38.6	35.6	9.2	20.2	12.7	24.0
Immigrant (%)	19.0	25.6	27.9	34.2	10.7	24.8	14.4	27.7
Education (%)								
Postsecondary degree	3.1	11.4	2.6	7.8	5.1	14.6	6.7	17.4
Some postsecondary	30.6	30.7	25.1	27.5	33.2	35.6	32.5	30.3
Secondary	28.8	28.6	30.9	33.3	26.9	29.1	24.9	30.5
Less than secondary	37.5	29.3	41.4	31.4	34.9	20.6	35.9	21.8
Adjusted household income‡					8807	8953	8065	8575
Urban§ (%)					84.7	81.7	83.3	83.8
Health insurance coverage¶ (%)	68.3	52.0	78.0	45.3				
Home owner (%)	9.6	22.2	7.6	20.2	13.5	50.4	13.1	41.4
Part-time employment (%)	54.9	45.2			58.6	27.8		
Mental health problem (%)	4.8	2.2	6.2	5.1	30.5	12.9	30.2	19.9
Region (%)								
Northeast (USA)/Atlantic (CA)	16.8	12.9	19.7	11.5	13.5	9.2	15.0	11.3
Midwest (USA)/Prairies (CA)	21.2	20.4	25.0	21.5	18.0	23.3	12.1	13.6
South (USA)/Quebec (CA)	23.8	41.5	21.5	43.8	25.0	19.1	32.8	18.0
West (USA)/Ontario (CA)	38.2	25.3	33.8	23.1	30.5	31.7	28.5	36.4
British Columbia (CA)					13.0	16.8	11.6	20.7

*p<0.05, **p<0.01, ***p<0.001.

†Due to small sample sizes, we were not able to include these categories in the Canadian sample; instead, they are combined with the 'other' category.

‡Continuous income data are not available in the NHIS public microdata file. We were able to identify the lowest decile of NHIS respondents using the available poverty ratio variable. However, we are unable to describe differences in household income within the lowest decile.

§The NHIS does not provide a variable to define urban versus rural living.

¶Due to universal public healthcare coverage, this variable was not used in the analysis of the CCHS.

NHIS, National Health Interview Survey; CCHS, Canadian Community Health Survey.

limiting our analysis to the lowest income decile, we excluded individuals whose socioeconomic circumstances rendered them ineligible for social assistance, thereby improving the comparability of our recipient and non-recipient groups. We excluded individuals who reported a disability or reported receiving entitlement-based employment insurance.^{8 20} We also excluded residents of Canada's three territories, for which equalised household income information was not available. Because the missing rate for any given variable was relatively low (ie, less

than 5%), we applied listwise deletion to remove observations with missing data. Our final analytic sample included 19 821 observations for the USA and 12 602 observations for Canada.

Exposure

In each country, we examined the largest social assistance programmes that provide means-tested cash benefits to individuals who demonstrate both financial need and a willingness to

work. In the USA, we focused on the federal Temporary Assistance for Needy Families (TANF) programme. In Canada, we focused on the main provincial social assistance programmes (eg, Ontario Works). Because evidence suggests that the effects of social assistance spillover to the entire household, we measured reciprocity at the household level.²¹ In the NHIS, a single question asked respondents to indicate whether any member of the household had collected TANF during the preceding year. In the CCHS, a single question asked respondents to indicate whether provincial social assistance was a contributing source to their household income during the preceding year.

Outcomes

We examined a range of health outcomes. Poor self-rated health was measured using a single five-item Likert scale that asked respondents to rate their general health status. We distinguished between those who reported ‘fair’ or ‘poor’ health and those who reported ‘excellent’, ‘very good’ or ‘good’ health. Chronic conditions were measured using a series of questions asking respondents to indicate whether they had ever been diagnosed with any of the following: asthma, emphysema, chronic bronchitis, chronic obstructive pulmonary disease, cancer, diabetes, heart disease or stroke. We distinguished between those who reported having one or more of these conditions and those who reported having none. Hypertension was measured using a single question that asked respondents to indicate whether they had ever been diagnosed with high blood pressure. Obesity was measured using self-reported height and weight variables. Respondents with a body mass index of 30 or above were coded as obese. We also examined a range of health-related risk behaviours, as these may be more sensitive to treatment than harder clinical outcomes. Smoking status was operationalised as daily/occasional or former/non. Alcohol status was operationalised as binge drinker or moderate/non-drinker. Binge drinking was defined as having five or more drinks in a single occasion at least once a month.²² Physical activity was operationalised using derived variables which distinguished between respondents who are inactive and those who are at least moderately active.

Predictors

Our analysis incorporated a range of variables that predict both social assistance reciprocity and health status. We included age, sex, family type (single, couple, single with children, couple with children), number of children, self-reported race/ethnicity

(white, black, Hispanic, Aboriginal, Asian, other), educational attainment (postsecondary, some postsecondary, secondary, less than secondary), immigrant status, homeownership, urbanicity, health insurance coverage and part-time employment. We further accounted for mental health status, which has been shown to influence selection into social assistance programmes.^{9 23} In Canada, respondents were coded as having a mental health problem if they reported having an anxiety or mood disorder. In the USA, respondents were coded as having a mental health problem if they reported depression, anxiety or an emotional problem. We also accounted for geographical region (Atlantic, Prairies, Quebec, Ontario and British Columbia in Canada; Northeast, Midwest, South and West in the USA).

Analytic strategy

We began by describing the key characteristics of the sample. Next, we used propensity score matching to estimate the average treatment effect of social assistance on the health of recipients—also known as the average treatment effect on the treated (ATT). Our main analyses proceeded in two steps. First, a propensity score was derived for each individual. This score is the estimated probability of exposure to treatment conditional on the set of observed characteristics that are known to predict both social assistance reciprocity and health status. These are listed above. In the second step, we matched individuals in the exposed and unexposed groups on the propensity score using two matching algorithms: 1:1 calliper matching with replacement (CM) and kernel weighting (KM). These algorithms were selected because they resulted in the most balanced matches. Their key features have been described in detail elsewhere.²⁴ We assessed the quality of each match using a series of two-sample t-tests to ensure that matched groups were in fact comparable on the relevant characteristics. With the groups balanced, we attributed any remaining difference in the outcome to treatment status (ie, social assistance reciprocity).

We performed three sets of sensitivity analyses to assess the robustness of our findings. Because problematic risk behaviours such as binge drinking predict later life socioeconomic adversity,^{25 26} they may influence selection into social assistance and confound the association between treatment status and our remaining outcomes. We therefore ran a complete set of supplementary analyses in which risk behaviours (ie, binge drinking, smoking and physical inactivity) were included in the pool of confounders used to estimate the propensity score. We also

Table 2 Health-related characteristics of the unmatched analytic samples

	USA (NHIS 2003–2014)				Canada (CCHS 2003–2014)			
	Employed		Unemployed		Employed		Unemployed	
	Recipients	Non-recipients	Recipients	Non-recipients	Recipients	Non-recipients	Recipients	Non-recipients
	n=1026	n=14561	n=609	n=3625	n=1746	n=8279	n=1556	n=1021
Poor self-rated health (%)	15.2	11.6	20.7	17.9	24.9	12.6	23.5	16.9
Chronic conditions (%)	24.8	20.4	27.9	25.8	30.3	18.8	26.7	18.9
Hypertension (%)	18.0	15.6	20.5	20.1	15.2	11.1	12.2	10.4
Obesity (%)	35.2	27.2	36.9	29.6	26.0	17.8	23.1	16.0
Smoker (%)	35.3	26.3	44.2	37.0	54.0	34.0	59.4	38.3
Binge drinker (%)	9.4	13.6	8.5	12.9	18.9	20.0	23.3	17.5
Physical inactivity (%)	44.6	41.5	37.9	36.2	55.2	54.1	42.8	44.5

*p<0.05, **p<0.01, ***p<0.001.

NHIS, National Health Interview Survey; CCHS, Canadian Community Health Survey.

Table 3 Assessing covariate balance before and after matching using two-sample t-tests

	USA (NHIS 2003–2014)						Canada (CCHS 2003–2014)					
	Employed			Unemployed			Employed			Unemployed		
	Unmatched	Calliper	Kernel	Unmatched	Calliper	Kernel	Unmatched	Calliper	Kernel	Unmatched	Calliper	Kernel
Age (years)	-4.34***	-0.36	-0.37	-5.58***	-0.17	-0.85	0.17	-1.75	-0.41	2.28*	-1.01	-0.05
Female	10.89***	-0.88	0.29	8.41***	-1.39	0.15	5.30***	-0.25	-0.55	-1.54	-0.22	-0.43
Household type												
Single				-11.71***	0.44	-0.45	8.11***	-0.03	0.71	5.41***	-0.26	0.2
Couple	-22.90***	0.14	-1.45	-7.41***	-0.51	-0.38	-8.01***	-0.99	-0.3	-3.63***	0.15	-0.08
Single with children	21.08***	-0.63	0.26	15.59***	-1.17	0.23	15.33***	0.98	0.01	4.90***	0	0.04
Couple with children	5.25***	0.55	0.72	3.41***	1.17	0.26	-16.61***	-0.58	-0.81	-10.02***	0.27	-0.3
Number of children (0–18 years old)	17.54***	-0.32	-0.06	15.14***	0.04	0.06						
Number of children (0–5 years old)							1.52	-0.35	0.13	3.20**	1.8	0.16
Number of children (6–11 years old)							0.83	-0.25	-0.61	2.65**	0.78	0.3
Race												
White	-7.30***	-0.65	-0.34	-6.42***	0.35	-0.33	4.05***	-1.89	-0.05	3.33**	0.21	-0.04
Black	7.57***	-0.83	-0.01	5.91***	0.47	-0.09						
Aboriginal	1.81	-0.58	0.39	0.8	0.5	0.05	9.73***	1.36	0.24	4.20***	-1.49	-0.91
Asian	-3.96***	0.33	-0.92	-1.52	-1.11	0.27						
Hispanic	1.93	1.07	0.29	1.05	-0.5	0.27						
Other or mixed	2.98**	2.15*	1.27	-0.71	0	0.15	-10.86***	1.15	0.2	-7.55***	1.3	1.03
Immigrant	4.16	0.25	-0.19	3.46***	0.36	0.07	-12.98***	0.78	-0.33	-8.43***	1.66	1.31
Education												
Postsecondary degree	-8.24***	-1.2	-0.84	-4.59***	0	-0.48	-10.83***	0.55	-0.2	-8.60***	-1.7	-0.36
Some postsecondary	-0.09	2.13*	0.73	-1.22	1.02	0.4	-1.96	-1.61	-1.28	1.17	-0.58	-0.86
Secondary	0.1	-1.7	-0.63	-1.18	-0.19	-0.32	-1.9	1	0.69	-3.13**	1.02	0.55
Less than secondary	5.58***	0.09	0.23	4.84***	-0.71	0.11	12.94***	0.43	0.73	7.69***	0.62	0.54
Adjusted household income												
Urban							-1.49	-1.67	-0.81	-4.10***	-0.27	-0.19
Health insurance coverage	10.15***	-0.34	0.29	15.33***	0.62	0.38	3.01**	-0.05	0.15	-0.37	-0.44	-0.55
Home owner	-9.49***	0.38	-0.31	-7.53***	0.11	-0.37	-29.42***	0.96	-0.28	-17.31***	0.59	0.31
Part-time employment	5.93***	0.54	-0.13				25.60***	0.48	0.79			
Mental health problem	5.13***	-1.22	-0.41	1.16	0.64	0.13	18.58***	0.26	0.22	5.87***	-0.89	-0.4
Region												
Northeast (USA)/Atlantic (CA)	3.56***	1.36	0.13	5.65***	-1.36	0.15	5.41***	0.66	0.53	2.70**	-0.47	-0.11
Midwest (USA)/Prairies (CA)	0.64	-0.43	0.02	1.88	0.4	-0.56	-4.81***	2.99**	0.12	-1.14	-0.44	-0.67
South (USA)/Quebec (CA)	-11.20***	-1.09	-0.51	-10.50***	-0.07	-0.35	5.66***	-1.36	0.2	8.40***	-0.31	1.24
West (USA)/Ontario (CA)	9.16***	0.32	0.33	5.68***	0.88	0.7	-0.97	-0.81	-0.64	-4.23***	0.97	-0.93
British Columbia (CA)							-3.89***	-1.04	-0.04	-6.34***	0.06	0.34

*p<0.05, **p<0.01, ***p<0.001.

NHIS, National Health Interview Survey; CCHS, Canadian Community Health Survey.

Table 4 Average treatment effects on the treated: American social assistance recipients (NHIS 2003–2014)

	Employed			Unemployed		
	Prevalence difference	SE	P values	Prevalence difference	SE	P values
Poor self-rated health						
Calliper matching†	0.022	0.021	0.287	0.046	0.027	0.090
Kernel weighting	0.032*	0.014	0.029	0.039*	0.020	0.046
Hypertension						
Calliper matching†	0.044*	0.020	0.031	−0.012	0.027	0.664
Kernel weighting	0.027*	0.013	0.042	0.014	0.019	0.466
Chronic conditions						
Calliper matching†	0.022	0.020	0.261	0.037	0.031	0.226
Kernel weighting	0.031*	0.016	0.047	0.020	0.021	0.343
Smoking						
Calliper matching†	0.073**	0.025	0.003	0.053	0.038	0.165
Kernel weighting	0.069***	0.016	0.000	0.063**	0.024	0.010
Binge drinking						
Calliper matching†	0.028*	0.133	0.034	−0.007	0.021	0.743
Kernel weighting	0.005	0.011	0.559	−0.003	0.015	0.846
Physical inactivity						
Calliper matching†	−0.003	0.028	0.914	−0.048	0.037	0.200
Kernel weighting	−0.014	0.017	0.384	−0.003	0.027	0.910
Obesity						
Calliper matching†	0.030	0.024	0.216	0.012	0.033	0.716
Kernel weighting	0.027	0.017	0.106	0.022	0.022	0.321
Sample size						
Unmatched	Recipients=1026 Control=14561			Recipients=609 Control=3625		
Calliper matching†	Recipients=994 Control=855			Recipients=589 Control=435		
Kernel weighting	Recipients=998 Control=14264			Recipients=603 Control=3625		

*p<0.05, **p<0.01, ***p<0.001.

†Calliper is set to 0.015; narrower than the 0.2 of the SD of the logit of the propensity score recommended by Austin.¹⁸

NHIS, National Health Interview Survey.

conducted additional models using an extensive set of alternative matching algorithms, including simple nearest neighbour matching, calliper matching without replacement, radius matching with different radius values and local linear matching. Finally, we ran sensitivity analyses in which social assistance reciprocity was measured at the person level rather than the household level.

Due to potential differences in characteristics and treatment effects across labour market groups, we stratified all our analyses by employment status. All analyses were conducted in Stata V.13.0 (StataCorp). Two principal Stata commands were used: `pSCORE` and `PSMATCH2`. A full example of our code is included in the online appendix accompanying this article. ATTs are reported in the text with their corresponding SE.

Limitations of the analytic strategy

Our estimation strategy aims to account for observable characteristics that are known to confound the relationship between social assistance and health. However, our results may be biased by unknown confounders. Furthermore, due to limitations of the available survey data, we could not account for several known confounders, such as wealth, savings, family support and other unmeasured sources of material support, that differ systematically between recipients and non-recipients. Nevertheless, by restricting our sample to observations in the lowest decile of income, we take an important step towards reducing

this potential selection problem. A related limitation concerns the secondary functions of social assistance programmes as gateways to ancillary services, such as Medicaid in the USA or supplemental drug and dental coverage in Canada. To the extent that an individual’s propensity to seek out ancillary coverage is likely to vary as a function of health status, these secondary functions may be operating as an additional source of bias. Again, due to limitations of the data, we were unable to account for this potential selection problem. Finally, many of our variables rely on self-report and are therefore subject to the corresponding biases.

RESULTS

Descriptive characteristics

We describe the key characteristics of the sample in [table 1](#) and [table 2](#). Compared with non-recipients, social assistance recipients in both the USA and Canada were more likely to be women, more likely to have children and less likely to be immigrants. Whereas a greater proportion of recipients belonged to visible minority groups in the USA, recipients in Canada were more likely than their non-recipient counterparts to identify as white. In the USA, recipients were more likely than non-recipients to have health insurance coverage. In the USA and to a greater extent in Canada, employed recipients were much more likely than non-recipients to be in part-time employment. In both

Table 5 Average treatment effects on the treated: Canadian social assistance recipients (CCHS 2003–2014)

	Employed			Unemployed		
	Prevalence difference	SE	P values	Prevalence difference	SE	P values
Poor self-rated health						
Calliper matching†	0.079***	0.017	0.000	0.013	0.024	0.596
Kernel weighting	0.068***	0.013	0.000	0.029	0.022	0.186
Hypertension						
Calliper matching†	0.034*	0.017	0.043	−0.016	0.021	0.450
Kernel weighting	0.019	0.012	0.107	−0.002	0.018	0.914
Chronic conditions						
Calliper matching†	0.051**	0.019	0.007	0.067*	0.027	0.012
Kernel weighting	0.067***	0.014	0.000	0.054*	0.023	0.019
Smoking						
Calliper matching†	0.078***	0.022	0.000	0.053	0.029	0.070
Kernel weighting	0.079***	0.016	0.000	0.060**	0.023	0.010
Binge drinking						
Calliper matching†	−0.025	0.017	0.134	0.034	0.025	0.169
Kernel weighting	−0.024*	0.012	0.043	0.030	0.021	0.140
Physical inactivity						
Calliper matching†	0.001	0.021	0.956	−0.035	0.029	0.230
Kernel weighting	−0.003	0.014	0.824	−0.035	0.028	0.210
Obesity						
Calliper matching†	0.054**	0.018	0.003	0.028	0.022	0.206
Kernel weighting	0.063***	0.012	0.000	0.048*	0.019	0.012
Sample size						
Unmatched	Recipients=1746 Non-recipients=8279			Recipients=1556 Non-recipients=1021		
Calliper matching†	Recipients = 1720 ‡ Non-recipients=1190			Recipients = 1480‡ Non-recipients=503		
Kernel weighting	Recipients = 1740 ‡ Non-recipients=8279			Recipients = 1550‡ Non-recipients=1021		

*p<0.05, **p<0.01, ***p<0.001.

†Calliper is set to 0.015; narrower than the 0.2 of the SD of the logit of the propensity score recommended by Austin.¹⁸

‡Due to administrative restrictions imposed by Statistics Canada, these values are rounded.

CCHS, Canadian Community Health Survey.

countries, recipients reported worse socioeconomic profiles than non-recipient, including lower levels of educational attainment and lower rates of home ownership. Social assistance recipients also reported consistently worse health outcomes.

Propensity score matching

Prior to matching, we observed significant differences in the underlying characteristics of social assistance recipients and their non-recipient counterparts. These differences were no longer significant after matching, as evidenced by the postmatch balance tests reported in table 3, which indicate satisfactory balance on these characteristics.

Treatment effects as well as the number of observations selected in each match are reported in table 4 and table 5. For a description of the range and distribution of the estimated propensity score, see online supplementary table 1 and online supplementary figure 1 of the online appendix. After matching on the propensity score, social assistance recipients in both the USA and Canada reported similar or worse health outcomes than matched non-recipients. In the USA, employed social assistance recipients reported higher rates of poor self-rated health (CM: ATT 2.2%, SE 0.021; KW: ATT 3.2%, SE 0.014), chronic conditions (CM: ATT 3.1%, SE 0.016; KW: ATT 2.2%, SE 0.020), hypertension (CM: ATT 4.4%, SE 0.020; KW: ATT 2.7%, SE 0.013), smoking (CM: ATT 6.9%, SE 0.016; KW: ATT 7.3%, SE 0.025) and binge drinking (CM: ATT 0.5%, SE 0.011; KW:

ATT 2.8%, SE 0.133) than matched controls. The ATTs reported for hypertension and smoking were statistically significant across both matching specifications, while the ATTs for poor self-rated health and chronic conditions were only significant using the kernel method, and the ATT for binge drinking was only significant using the calliper method. Unemployed social assistance recipients reported higher rates of poor self-rated health (CM: ATT 4.6%, SE 0.027; KW: ATT 3.9%, SE 0.020) and smoking (CM: ATT 5.3%, SE 0.038; KW: ATT 6.3%, SE 0.024) than matched controls, though these ATTs were only significant using kernel matching. Differences in the remaining outcomes were not statistically significant.

In Canada, employed social assistance recipients reported higher rates of poor self-rated health (CM: ATT 7.9%, SE 0.017; KW: ATT 6.8%, SE 0.013) chronic conditions (CM: ATT 5.1%, SE 0.019; KW: ATT 6.7%, SE 0.014), hypertension (CM: ATT 3.4%, SE 0.017; KW: ATT 1.9%, SE 0.012), obesity (CM: ATT 5.4%, SE 0.018; KW: ATT 6.3%, SE 0.012), smoking (CM: ATT 7.8%, SE 0.022; KW: ATT 7.9%, SE 0.016) and binge drinking (CM: ATT 2.5%, SE 0.017; KW: ATT 2.4%, SE 0.012). In most cases, these ATTs were statistically significant across both matching specifications. Unemployed social assistance recipients reported higher rates of chronic conditions (CM: ATT 6.7%, SE 0.027; KW: ATT 5.4%, SE 0.023), obesity (CM: ATT 2.8%, SE 0.022; KW: ATT 4.8%, SE 0.019) and smoking (CM: ATT 5.3%, SE 0.028; KW: ATT 6.0%, SE 0.023). The ATT

for chronic conditions was statistically significant across both matching specifications, while the ATTs for obesity and smoking were only significant using the kernel method. Differences in the remaining outcomes were not statistically significant.

Supplementary analyses in which we treated risk behaviours (ie, binge drinking, smoking and physical inactivity) as confounders, rather than outcomes, produced very similar results. These additional results are reported in online supplementary table 2 and online supplementary table 3 of the online appendix. Supplementary models (not shown) in which we employed an extensive set of alternative matching algorithms and measured social assistance reciprocity at the person level rather than the household level revealed that our results are robust across these key analytic decisions.

DISCUSSION

Analytic models in which we carefully controlled for socioeconomic and other differences between social assistance recipients and non-recipients demonstrated that in most cases, receipt of social assistance was associated with worse health status, and at best, with no effect on health status. This finding held true across several different matching strategies and a diverse range of outcomes. Contrary to public health theory—which would predict that social assistance policies confer a benefit to the health of the income-insecure—and despite conducting the most rigorous possible comparisons given the available data, these results are consonant with the existing literature from the USA,^{8–10 12 13} Canada¹⁵ and peer nations in Europe.^{7 11 14}

On the surface, these results might lend support to the notion that providing benefits is inherently problematic for health. However, based on a vast body of literature that substantiates the benefits of increased income for the socioeconomically vulnerable, such an explanation would appear to lack merit.^{1–4} Rather, there are other far more plausible explanations worth considering. It may be the case, for example, that the level of income support currently provided by social assistance programmes are insufficient to adequately buffer the adverse consequences of income insecurity. In both the USA and Canada, the generosity of social assistance programmes was severely curtailed in the 1990s.^{27 28} Governments have undertaken little legislative effort since that time to increase benefit levels or allow them to keep up with rising costs of living.^{29 30} As a result, the socioeconomic circumstances of recipients are lagging further and further behind that of their more advantaged counterparts. This may provide a powerful explanation for our study findings and for broader evidence that health inequalities between socioeconomic groups are widening over time.

Work conditionalities attached to the receipt of social assistance provide another possible explanation for our findings. In order to maintain programme eligibility, social assistance recipients are expected to meet an increasingly strict set of requirements that compel labour market participation.³¹ While these measures have succeeded at increasing employment rates among social assistance recipients, their attachment to the labour market tends to be marginal, short-lived and involve the uptake of low paying, poorly protected jobs.^{32–35} Recent evidence suggests that these precarious jobs may pose an equal or even greater risk to health than unemployment.^{36–39} Programme conditionalities that compel entry into precarious labour market arrangements may offset the potential health benefits of social assistance, and thus may in part explain why we have failed to find evidence of a protective effect associated with reciprocity.

Finally, though we carefully controlled for many of the most notable sources of confounding, our results may reflect unaccounted for selection effects that differentiate social assistance recipients from non-recipients, thus making for problematic comparisons. For example, in the context of social assistance programmes providing a gateway to ancillary benefits that are not universally available (eg, health insurance), our results may reflect a propensity for people who are sicker to select into social assistance.⁴⁰ In a similar vein, individuals with unmeasured sources of wealth or family support may opt out of or be ineligible for social assistance. Unfortunately, we lack the data necessary to take account of these additional factors. In both cases, however, they are likely to bias findings towards a negative association between social assistance reciprocity and health.

CONCLUSIONS

The results of our study were remarkably consistent across jurisdictions, health outcomes and model specifications: the receipt of social assistance is associated with poorer health status or, at best, the absence of a clear health advantage, even after controlling for alternative explanations such as differences in the demographic and socioeconomic characteristics of recipients and non-recipients. With significant evidence that social assistance programmes have not kept up with the cost of living, these findings lend support for the notion, at least from a public health perspective, that interventions are warranted that will improve the generosity of existing social assistance programmes. This may include reversing welfare reforms implemented over the past several decades, increasing benefit rates and untethering benefit reciprocity from work conditionalities.

What is already known on this subject

- ▶ Social assistance programmes are designed to provide income supplementation to socioeconomically disadvantaged populations.
- ▶ Social assistance reciprocity is associated with adverse health outcomes.
- ▶ Prior studies have not used the best available methods to disentangle policy effects from underlying differences between social assistance recipients and non-recipient comparison groups.

What this study adds

- ▶ We employed propensity score methods to match social assistance recipients to comparable non-recipient 'controls' and estimated the effect of reciprocity on a range of health outcomes in Canada and the USA.
- ▶ After carefully controlling for demographic and socioeconomic differences between recipients and non-recipient 'controls', social assistance reciprocity was associated with worse health outcomes or, at best, no clear health advantage.
- ▶ Our study findings support the notion that interventions are warranted that will improve the scope and generosity of existing social assistance programmes.

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