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Conditional Cash Transfers And Health Of Low-Income Families In The US: Evaluating The Family Rewards Experiment

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ABSTRACT Opportunity NYC–Family Rewards was the first conditional cash transfer, randomized controlled trial for low-income families in the United States. From 2007 to 2010, Family Rewards offered 2,377 New York City families cash transfers that were conditional upon their investments in education, preventive health care, and parental employment. Their health and other outcomes were compared to those of a control group of 2,372 families. The experiment led to a modest improvement in health insurance coverage and a large increase in the use of preventive dental care. It improved parents' perception of their own health and levels of hope, mainly through improvements in reported financial well-being. While the program's impacts on physical health were weaker, our study might not have captured effects on chronic disease risk that take longer to accrue. In the context of New York City's operating social-safety-net programs, conditional cash transfers may have led to positive, albeit modest, improvements in the health of poor families.

Conditional cash transfers have become widespread in low- and middle-income countries over the past fifteen years.[1] These transfers provide cash benefits to families on the condition that they engage in activities that generate long-term benefits, such as using preventive care services or attending school regularly. These programs pursue two simultaneous objectives: to reduce immediate financial hardship and to promote parents' investment in both their own and their children's well-being. The overarching idea is that such incentives will break the intergenerational cycle of poverty and generate individual as well as societal benefits.

In 2007 the Center for Economic Opportunity of the New York City Mayor's Office initiated the first conditional cash transfer program in the US, Opportunity NYC–Family Rewards (hereafter, Family Rewards). The program was explicitly modeled after Mexico's Oportunidades.[2] The New York City program was privately funded[3] and was offered to low-income families in six of New York City's most deprived communities—two each in the boroughs of the Bronx, Brooklyn, and Manhattan. It operated for three years (2007–10) and provided cash rewards in the areas of children's education, preventive health care, and employment.[4]

There were two main mechanisms through which Family Rewards could improve the health of poor families. First, through its health-related incentives, it encouraged participating families to increase their use of preventive care services. The expectation was that such increases would translate into better health outcomes. Second, the increase in family income brought about by the cash transfer could increase the ability of the families to invest in healthy lifestyles and reduce financial stress, since lifestyle and financial stress are risk factors for poor physical and mental health.[5]

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Robust evaluations of similar programs in low- and middle-income countries suggest that they hold promise as tools for improving population health.[6] Oportunidades and other interventions across Latin America have led to large increases in the use of health services, including the number of visits to health facilities and receipt of prenatal care and pediatric examinations.[7–9] Evidence shows that the interventions have also improved some health outcomes—in particular, developmental, nutritional, and cognitive measures among children.[10,11]

In this article we examine the impact of Family Rewards on the health of low-income families. We synthesize findings from and extend previous reports on this experiment[4,12,13] by examining its effects on outcomes related to health care use that were directly incentivized by the program and on health outcomes. We also explore some of the mechanisms through which Family Rewards may have affected the health of participating families.

The Family Rewards Experiment: Design And Previous Findings

The program was created by the Center for Economic Opportunity, in partnership with MDRC (a nonprofit social policy evaluation organization) and Seedco (a workforce and economic development organization).[14]

The Oportunidades program had been implemented in low- and middle-income rural settings in its original location in Mexico. To tailor it for a high-income urban context in the US, three key adaptations were necessary.[2] First, Family Rewards was designed to complement existing government programs such as the Earned Income Tax Credit. Second, payments were made conditional on meeting a larger number of specific targets (there were twenty-two potential rewards, compared to six in Oportunidades) to link rewards more closely to specific behaviors.[4] Third, Family Rewards offered rewards in the domain of parental employment in addition to children's education and family preventive health care use.

Family Rewards offered cash rewards for completing twenty-two activities in its three core areas (for an overview of activities and rewards, see online appendix exhibit 1).[15] Participating families were eligible to receive cash transfers every two months over the three-year period. All behaviors were verified by Seedco, using administrative data or coupons submitted by families. Seedco also oversaw the payment system. No limits or conditions were imposed on how families could spend the rewards. Family Rewards received ethical approval from the MDRC

Institutional Review Board.

Health-related conditions included having continuous health insurance coverage, preventive health care checkups, and dental care. Incentives for obtaining and sustaining health insurance were available to those families that were eligible for publicly provided health insurance through Medicaid (including the Children's Health Insurance Program and Family Health Plus) or through their employers.[4] Rewards were designed to encourage families to obtain comprehensive preventive care and use private or community health services (rather than emergency services) for routine care.

The program was evaluated using a randomized controlled trial design: The 4,749 families recruited at baseline were randomly assigned to the program ("treated") group ($n = 2,377$), whose members received Family Rewards incentives, or to a control group ($n = 2,372$), whose members were not offered incentives. The sample was recruited in the period July 2007–January 2008, and the program operated for three years (for details of the study design, see appendix exhibit 2).[15] Eligibility was based on a combination of family income (which had to be at or below 130 percent of the federal poverty level), the grade the child would enter in September 2007 (fourth, seventh, or ninth grade), home location (in six community districts in the Bronx, Brooklyn, and Manhattan), and citizenship status (all participants, both parents and children, had to be US citizens or legal residents at the time of enrollment).

Family Rewards distributed a total of $20.6 million in cash transfers to participating families.[13] On average, households earned $8,674 over the three years of the program. Roughly 98 percent of families received cash incentives in the education and health domains, while only 53.2 percent earned a reward in the parental employment domain.[12,16] Family Rewards led to a significant increase in household income and a reduction in poverty and material hardship.[16] These improvements diminished once the cash transfers were no longer available, but the positive effect on perceived financial well-being was sustained beyond the end of the program.[13] Family Rewards improved graduation rates for children in ninth grade when they entered the program and other school outcomes for children who entered high school as proficient readers.[12] Parental reported employment increased as a result of the program, but this was not confirmed by administrative data from the state's unemployment insurance system.[12] Additional details on the program can be found in the 2010 MDRC report, which also includes a qualitative evaluation of the experience of users

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and staff members.[4]

In this article we further examine the impact of the experiment on health care use and health outcomes, and we explore potential mechanisms for linking cash transfers to health.

Study Data And Methods

DESIGN The analysis draws on three rounds of survey data, capturing baseline outcomes and those during and after the program. Survey data were first collected at baseline for all participants (4,749 families), covering demographic, socio-economic, and health status information before study entry. A randomly selected subset of the sample was interviewed face-to-face at eighteen and forty-two months (3,082 and 2,966 families, respectively). The forty-two-month survey was fielded six months after the program ended. Response rates at eighteen and forty-two months were 84 percent and 82 percent, respectively, for the program group and 80 percent and 76 percent, respectively, for the control group. Previous analyses suggest that program and control groups were representative of baseline characteristics and that there were no systematic differences between the two groups in response rates or missing data.[12,17]

HEALTH CARE USE Respondents were asked whether they and their children had medical coverage of any type in the previous month. Preventive health care use was assessed using binary indicators of whether or not, in the past year, the respondent had seen their personal doctor or health care provider, had had at least two dental visits, had used the emergency department (ED) as their usual source of care, and had been treated for any medical condition. Unmet health care needs were identified by whether the respondent did not have medical care or did not fill a prescription because of financial constraints in the past year.

Children's health care access was assessed by asking parents whether the child had a routine health care provider and a personal pediatrician. Preventive health care use was assessed based on whether the child had had a health checkup and at least two dental visits in the past year. In addition, for children younger than age six, respondents were asked whether, in the past year, the child had had a physical examination and a dental checkup and had been screened for an early intervention program.

PHYSICAL HEALTH For adults, self-reported health was measured on a scale ranging from 1 (poor) to 5 (excellent). Respondents' body mass index (BMI) was determined based on self-reported weight and height. In addition, respondents were asked to report whether they had

been diagnosed with asthma, high blood pressure, high cholesterol, or diabetes. Respondents were also asked whether they were current smokers at the time of interview.

Physical health measures for children included the child's health as rated by parents, again on a scale ranging from 1 (poor) to 5 (excellent); and binary indicators of whether the child had any health condition (physical, mental, or learning disability), an attention deficit disorder, or asthma.

HOPE AND MENTAL HEALTH The State Hope Scale is a validated six-item measure of hope.[17] It includes two dimensions, measuring agency (goal-directed thinking—that is, having the ability to initiate and sustain action) and pathways (planning to accomplish goals).[17] The scale ranges from 6 (low hope) to 24 (high hope). Higher levels of hope are associated with several indicators of positive mental health, while low levels of hope are associated with symptoms of mental illness and depression.[18]

At eighteen months, respondents were asked if they had experienced serious psychological distress in the past month and were administered the Kessler Psychological Distress (K10) scale, a validated ten-item measure of psychological distress experienced in the past month.[19] Scores range from 10 (no distress) to 50 (severe distress). The State Hope Scale and the K10 scale were measured among a randomly selected subsample of all respondents ($n = 2,043$).

PERCEIVED MATERIAL CIRCUMSTANCES A perceived financial well-being score was calculated by asking respondents whether they agreed with the following statements: "Your financial situation is better than last year," "You don't worry about having enough money in the future," "You can generally afford to buy needed things," and "You sometimes have enough money to buy something or go somewhere just for fun." The

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A key difference between Family Rewards and its Mexican predecessor is Family Rewards' lack of effect on children's health.

score ranges from 4 to 16 points, with higher scores indicating higher financial well-being. A food insufficiency scale assesses whether families had enough to eat in the past month. The scale ranges from 1 (often not enough to eat) to 4 (enough to eat of the kinds of food desired).

APPROACH Because Family Rewards was evaluated through a randomized controlled trial, its effects can be identified by comparing outcomes between the program and control groups. The two groups were not significantly different in most baseline characteristics.[4]

We conducted an intent-to-treat analysis to assess the impact of Family Rewards on health care use and health, separately for parents and children. We used ordinary least squares regressions to improve precision and eliminate any group imbalances. All models controlled for sex, race/ethnicity, parental level of education, parental marital and employment status, number of children, and primary language spoken at home.

We employed a Blinder-Oaxaca decomposition approach to describe the factors that contributed to the impact of Family Rewards on health.[20] The method decomposed outcome differences between the program and control groups into two components: an "explained" part attributed to differences between the two groups in terms of factors affected by the program and an "unexplained" part attributed to differences in how the factors affected by the program are associated with the outcomes in the two groups.[20] The advantage of this approach is that it reveals the extent to which differences in health might be associated with specific intermediate measures. For example, changes in self-reported health in the program group might be explained by changes in preventive health care use or health insurance coverage. Decomposition analyses used posttreatment follow-up assessments of

health insurance coverage, preventive health care use, unmet health care needs, smoking, and financial well-being. More details are provided in appendix exhibit 3.[15]

LIMITATIONS This study had several limitations. First, the decomposition approach is descriptive and not a definitive test of the relative importance of different mechanisms.

Second, the integrated nature of the program meant that causal effects could be ascribed to the intervention, but not to specific incentives.

Third, although our results have strong internal validity, there are potential limitations to their external validity. For one, participants might have been more motivated, on average, than nonparticipants to change behaviors and report these changes. For another, the intervention targeted low-income families—many of which were African American or Latino families headed by a single parent—which were representative of their neighborhoods[4] but not necessarily of other cities or nations.

Fourth, the in-program and post-program data were collected on a randomly selected subsample, which reduced statistical power. However, previous analyses have confirmed that the survey samples provided reliable estimates that could be generalized to the study population.[12]

A final limitation is related to physical health measures. The data did not include a clinical examination: Outcomes were self-reported and included binary diagnoses of chronic conditions, which might fail to capture impacts on disease management or prognosis improved by closer contact with health services. Correcting for BMI self-reporting bias did not substantially change our results (see appendix exhibit 4 for full results).[15] Finally, no information was available on important health behaviors such as drinking, nutrition, physical activity, and sleep, which could have changed in response to the program.

Study Results

More than 80 percent of participating households were headed by a single parent, most often a mother (exhibit 1).[15] Nearly all families were either Hispanic or African American. Many families were already receiving public assistance at baseline, in the form of Supplemental Nutrition Assistance Program (SNAP) benefits (59.4 percent) or housing assistance (53.3 percent). Just over half of the sample were working at baseline, but only about 20 percent were working more than thirty hours per week. Only about 6 percent of parents and 3 percent of children had no medical insurance coverage in the past year. Most parents had used preventive care services in

Selected baseline characteristics of families participating in the Opportunity NYC–Family Rewards program, overall and by program or control group, 2007

	Overall	Program	Control
FAMILIES			
Number	4,749	2,377	2,372
One-parent family	80.9%	80.5%	81.4%
Primary parent			
Female	94.6	94.9	94.2
Hispanic	47.1	47.3	46.9
African American	50.5	50.7	50.3
Currently working	51.1	49.9	52.4
Currently working more than 30 hours			
per week	19.7	19.2	20.3
Health insurance coverage			
Public	72.6	72.4	72.7
Employer sponsored	18.9	19.4	18.3
Other	2.8	2.7	2.8
None	5.8	5.4	6.1
Within the past year, had:			
Routine medical checkup	81.7	81.9	81.3
Preventive dental checkup	64.8	64.9	64.7
Self-rated health			
Excellent or very good	43.5	43.3	43.7
Good	37.4	37.3	37.5
Fair or poor	19.1	19.4	18.9
CHILDREN			
Number	11,331	5,670	5,661
Parent's rating of child's health			
Excellent or very good	74.6%	75.7%	73.5%
Good	21.8	21.1	22.6
Fair or poor	3.5	3.2	3.8

SOURCE Authors' analysis of data from the Family Rewards baseline sample. **NOTES** Percentages might not sum to 100 because of rounding. Analyses are conducted on the primary parent within each family. A fuller version of this table is included as appendix exhibit 5 (see note 15 in text).

the past year, in the form of a routine medical checkup (more than 80 percent) or dental checkup (about 65 percent). Nearly one in five adults rated their own health as fair or poor. Only 3.5 percent of children were described by their parents as having fair or poor health.

EFFECTS ON PARENTS At eighteen months, Family Rewards led to modest, albeit significant, increases in the probability that respondents and their children were covered by health insurance compared to families in the control group (differences of 1.0 percentage point and 1.9 percentage points, respectively) (exhibit 2). Program participants also had significantly higher probabilities of having seen their personal doctor or health care provider in the past year and of having been treated for any medical condition than the control group, although these effects were small in magnitude (differences of 3.9 percentage points and 4.2 percentage points, respectively). They were also significantly less likely than those in the control group to have used the ED as their usual source of care in the past year (a

difference of –1.7 percentage points). The largest effect was found for dental visits, where the difference between the groups was 11.6 percentage points. Program participants were less likely to have forgone medical care due to costs in the past year (a difference of –2.9 percentage points), and they scored slightly but significantly higher than those in the control group on the self-rated health scale (a difference of 0.15 points on the scale). The program had no significant effects on other measures of physical health or on the Kessler Psychological Distress scale (appendix exhibit 6)[15] at eighteen months.

At forty-two months (six months after the program's end), many of the effects observed during the program had disappeared (exhibit 2). Program participation was still associated with a higher probability of having health insurance coverage compared to the control group (a of 2.2 percentage points). The most consistent effect of the program among incentivized behaviors was on dental visits (a difference of 13.0 percentage points). A small reduction in forgoing medical care because of cost persisted. No effect on physical health outcomes was detected at forty-two months. However, although not significant, the effect on self-rated health was of similar magnitude to that at eighteen months. Family Rewards participants scored half a percentage point higher on the State Hope Scale.

EFFECTS ON CHILDREN At eighteen months, the only consistent effect on children's outcomes was on dental visits, an outcome directly incentivized by the program (exhibit 3). Children in the intervention group were more likely to have had at least two dental check-ups in the past year, compared to those in the control group (a difference of 11.8 percentage points). This effect persisted at forty-two months (a difference of 14.6 percentage points). Family Rewards was not associated with increases in other preventive health care use or with health outcomes in children.

POTENTIAL MECHANISMS We decomposed observed differences in adults' self-rated health at eighteen months and State Hope Scale scores at forty-two months—two outcomes for which we observed significant improvements among program participants (appendix exhibit 8).[15] Differences between the program and control groups in factors affected by the experiment explained to a large extent the gap in these outcomes, accounting for 56 percent of the gap in average self-rated health at eighteen months and 42 percent of the difference in average hope scores at forty-two months. Differences in average self-rated health at eighteen months were primarily associated with families in the program group enjoying higher levels of financial well-being

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Effect of Opportunity NYC–Family Rewards program on parental outcomes at 18 and 42 months

	At 18 months (n = 3,082)			At 42 months (n = 2,966)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
PREVENTIVE HEALTH CARE USE AND INSURANCE COVERAGE IN THE PAST YEAR						
Health insurance coverage	94.3%	95.3%	1.0***	93.9%	96.1%	2.2***
Children's insurance coverage	92.8	94.7	1.9***	93.9	95.3	1.4
Seen personal doctor	80.2	84.1	3.9****	95.4	95.5	0.1
At least 2 dental visits	57.5	69.1	11.6****	34.4	47.4	13.0***
Treated for any condition	41.9	46.1	4.2****	46.8	50.3	3.5
ED was usual source of care	4.9	3.2	−1.7***	3.7	3.2	−0.5
No medical care because of cost	9.2	6.3	−2.9****	8.1	5.1	−3.0***
Did not fill Rx because of cost	14.6	14.2	−0.4	10.9	12.4	1.5
HEALTH OUTCOMES						
Average self-rated health[a]	3.05	3.2	0.15****	3.0	3.1	0.13
Asthma diagnosis	15.3%	17.4%	2.1	16.5%	16.7%	0.2
Average BMI	30.4	30.2	−0.2	30.4	30.1	−0.3
High blood pressure diagnosis	20.4%	21.2%	0.8	24.8%	26.2%	1.4
High cholesterol diagnosis	8.6%	9.7%	1.1	10.3%	10.7%	0.4
Diabetes diagnosis	7.2%	9.1%	1.9	9.7%	11.9%	2.2
Currently smoking	23.3%	20.7%	−2.6	23.3%	20.8%	−2.5
Average State Hope Scale score[b]	17.3	17.5	0.2	17.5	17.9	0.51****

SOURCE Authors' analysis of data from the Family Rewards baseline sample and from 18-month and 42-month surveys. The two surveys are of randomly selected subsets of the baseline sample. Analyses are conducted on the primary parent within each family. **NOTES** Adjusted differences are those between control and program groups, obtained from a linear regression model. All models controlled for the following selected baseline characteristics: age, sex, ethnic background, parental employment and marital status, household primary language, and parental level of education. Robust standard errors were clustered at the household level. Full results are presented in appendix exhibit 6 (see note 15 in text). ED is emergency department. BMI is body mass index, measured as kg/m^2. [a]On a scale ranging from 1 (poor) to 5 (excellent). [b]Scores range from 6 (low hope) to 24 (high hope). See note 17 in text. ***$p < 0.01$ ****$p < 0.001$

Effect of Opportunity NYC–Family Rewards on children's outcomes at 18 months and 42 months

	At 18 months (n = 6,559)			At 42 months (n = 6,464)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
PREVENTIVE HEALTH CARE USE AND INSURANCE COVERAGE IN THE PAST YEAR						
Has routine health care provider	93.6%	93.9%	0.3	91.2%	92.6%	1.4
Has personal pediatrician	92.3%	92.5%	0.2	88.3%	87.7%	−0.6
Had health checkup	96.6%	97.5%	0.9	94.0%	96.3%	2.3
Had at least 2 dental visits	60.5%	72.3%	11.8****	48.3%	62.9%	14.6****
Physical health						
Average children's health[a]	3.82	3.8	0.05	3.8	3.9	0.1
Has any health condition	28.2%	27.2%	−0.1	27.5%	27.1%	−0.4
Has an attention deficit disorder	4.9%	3.7%	−1.2	3.6%	3.1%	−0.5
Has asthma	10.8%	10.2%	−0.6	9.1%	9.6%	0.48
FOR CHILDREN UNDER AGE 6 IN THE PAST YEAR						
Had physical examination	97.1%	97.6%	0.6	96.2%	99.0%	2.8
Had a dental checkup	64.2%	73.5%	9.3	61.3%	63.7%	2.4
Was screened for an early intervention program	24.9%	33.5%	8.6	24.7%	30.8%	6.1

SOURCE Authors' analysis of data from the Family Rewards baseline sample and from 18-month and 42-month surveys. The two surveys are of randomly selected subsets of the baseline sample. **NOTES** Adjusted differences are those between control and program groups, obtained from a linear regression model. All models controlled for the following selected baseline characteristics: age, sex, ethnic background, parental employment and marital status, household primary language, and parental level of education. Robust standard errors were clustered at the household level. Full results are presented in appendix exhibit 7 (see note 15 in text). [a]Rated by parents on a scale ranging from 1 (poor) to 5 (excellent). ****$p < 0.001$

(67 percent of the difference) and using more preventive health care services (33 percent of the difference). Improved financial well-being also explained 32 percent of the gap in State Hope Scale scores between the two groups at forty-two months, while preventive care use explained 21 percent of the difference. Other factors, such as health insurance coverage, did not contribute significantly to health differences between the two groups.

Discussion

The objective of this study was to assess the effects of the Opportunity NYC–Family Rewards experiment on participants' health care use and health. Several important findings emerged from this experiment. First, the program had modest but meaningful effects on the use of some preventive health services, especially dental care. Second, it had a positive impact on parents' perceptions of their health as well as their level of hope, mainly through improvements in reported financial well-being. Third, while evidence of the program's effects on physical health is weaker, our study offers a limited window on these outcomes and might not fully capture impacts on chronic disease risk and management that may take longer to accrue.

Program households made greater use of preventive health services than control households did; use of preventive services was a key outcome upon which a cash transfer was conditioned.[1] However, the effects remained modest relative to those observed in Latin American programs, where baseline levels were low and effect sizes many times higher.[8] The exception was dental care, with a difference of 11.6–14.6 percentage points as a result of Family Rewards. This is an important effect: Oral health care is one of the largest unmet health care needs in the US, and the single largest among children.[21]

Adult participants also reported better self-rated health, which echoes findings from Mexico's Oportunidades.[10,22] This positive effect is remarkable, as very few social policy interventions in high-income countries have managed to move the needle on self-rated health.[23] At forty-two months (after the program's end), Family Rewards participants also had higher scores than controls on the State Hope Scale. While this score is not a direct measure of mental health, this finding should not be underestimated: Higher levels of hope in adults are associated with higher life satisfaction, self-esteem, and self-rated physical health and with reduced depressive symptoms.[24] Family Rewards' effects on health were mainly linked to improvements in perceived financial well-being. Program partici-

Further experimental evidence is required to explain the relatively small changes in behavior generated by the program.

pation was associated with a 22 percent increase in average monthly income,[12,13,16] an effect similar to that of Oportunidades, which increased the average income of participating families by 25 percent.[9] Reductions in financial hardship may be a meaningful pathway by which the program exerted an effect.

A key difference between Family Rewards and its Mexican predecessor is Family Rewards' lack of effect on children's health. While a range of health outcomes improved among children in Oportunidades,[10,11] those in Family Rewards saw only improved dental visits. Likewise, many measures of adult physical health were left unaffected by the program. These findings have been largely confirmed in Family Rewards 2.0,[25] a replication study implemented in Memphis, Tennessee, and the Bronx in 2011 that added family guidance to the original design and reduced the number of rewards but still found limited health effects in children and adults.

Several factors might explain the mixed effects of Family Rewards. First, it operated alongside a range of long-standing social programs such as the Earned Income Tax Credit and Medicaid. This contrasts with the situation in lower-income countries, where these transfers were introduced in the context of relatively limited social safety nets. A second, related explanation refers to the very high levels of compliance at baseline with behaviors incentivized by the program, such as having health insurance coverage and preventive checkups—in part the result of previous efforts by the City of New York to expand health insurance to low-income families.[26] Consequently, there was limited room for additional take-up. This may also explain the large effects for dental care visits, for which baseline levels were lower than for other measures of preventive care.

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Third, studies in low- and middle-income countries have largely focused on postnatal and early-life outcomes such as birthweight and child growth.[11] In contrast, our evaluation focused on noncommunicable diseases and risk factors. Changes in chronic disease risk may take longer to manifest themselves and consequently might not have been captured in the relatively short time horizon of our evaluation. Finally, a unique aspect of Family Rewards was to add rewards for parental employment. While 53.2 percent of households earned a reward in this area,[12,16] the program did not produce meaningful improvements in parental employment—a key outcome on which the long-term effects on health and well-being had been hypothesized. Weak effects on employment may be partly due to the Great Recession of 2007–09, which likely limited participants' opportunities for paid employment. This in turn points to the limitation of imposing conditions that cannot realistically be met.

Policy Implications

Our findings contribute to the debate about conditional cash transfers[27,28] by providing experimental evidence of effects on health in the US. Overall, these results offer a contrasted picture. Family Rewards improved measures of subjective health, hope, and dental care among poor families, thus contributing to reducing health disparities. However, it had no or limited effects on disparities in a range of other health outcomes. These findings suggest that in the context of New York City's operating social-safety-net programs and within a three-year window, conditional cash transfers may have led to positive, albeit modest, improvements in the health of poor families.

Further experimental evidence is required to explain the relatively small changes in behavior generated by the program. Future studies should also compare the health benefits of conditional relative to unconditional transfers[29] and examine the potential long-term effects on children and families. ∎

NOTES

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15 To access the appendix, click on the Details tab of the article online.

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APPENDIX

Appendix Exhibit 1. Amount and schedule of the cash transfers offered by Family Rewards, Opportunity NYC-Family Rewards experiment, 2007-2010

Domain	Amount
Education incentives	
Elementary and middle school students	
Attends 95% of scheduled school days [a]	$25 per month
Scores at proficiency level (or improvement) on annual math and English language arts (ELA) tests	$300 per math test; $300 per ELA test for elementary school students.
	$350 per math test; $350 per ELA test for middle school students
Parents reviews low-stakes interim test [b]	$25 for parents to download, print and review results (up to 5 times per year)
Parents discussed annual math and ELA test results with teachers [a]	$25 (up to 2 tests per year)
High school students	
Attends 95% of scheduled school days	$50 per month
Accumulates 11 course credits per year	$600
Passes Regents exams	$600 per exam passed (up to 5 exams)
Takes PSAT test	$50 for taking the test (up to 2 times)
Graduates from high school	$400
All grades	
Parent attends parent-teacher conferences	$25 per conference (up to 2 times per year)
Child obtains library card [a]	$50 once during the program
Health incentives	
Maintaining public or private insurance [a]	Per month: $20 (public); $50 (private) for each parent covered
	Per month: $20 (public); $50 (private) if all children are covered
Annual medical checkup	$200 per family member (once per year)
Doctor-recommended follow-up visit [a]	$100 per family member (once per year)
Early-intervention evaluation for child under 30 months old, if advised by the pediatrician	$200 per child (once per year)
Preventive dental care (cleaning/checkup)	$100 per family member (once per year for children 1-5 years old; twice per year for family members of 6 years of age or older)
Workforce incentives	
Sustained full-time employment [c]	$150 per month
Education and training while employed at least 10 hours per week [d]	Amount varied by length of course, up to a maximum of $3,000 over three years

Source: Adapted from Riccio et al, 2010. **Notes**: In an effort to simplify the experiment, reduce its costs and improve its replicability if successful, a number of rewards were eliminated after the first year as noted in the table. The primary parent received the transfers corresponding to all health, work and elementary/middle school related rewards, while high school students, depending on the reward, directly received the entire payment or split half of the value with their parents.
[a] Discontinued after Year 2 of the program.
[b] Discontinued after Year 1 of the program.
[c] Full-time employment is defined as working 30 hours per week.
[d] The employment condition was removed after Year 2 of the program.

Appendix Exhibit 2. Randomization, program and follow-up of participants in Family Rewards, Opportunity NYC-Family Rewards experiment, 2007-2010

Program timeline

Appendix Exhibit 3. Technical Appendix, Oaxaca-Blinder decomposition

The Oaxaca-Blinder decomposition is a regression-based model which divides the gap in the outcome of interest between two groups into an 'explained' portion and an 'unexplained' portion. The 'explained' portion of the gap corresponds to the difference in the outcome attributable to group differences in a set of measured predictor variables between the treated and control group. The 'unexplained' portion comes from differentials in how the predictor variables are associated with the outcomes in the control and treated groups. This is accomplished by building an OLS regression equation to obtain slope values (beta) for all variables of interest, and then varying the estimate (X) values of interest.

After adjustment on parental baseline characteristics (gender, race/ethnicity, educational attainment, marital status, employment status, number of children and primary language spoken at home), we considered a range of predictor variables in our models: health insurance coverage (binary indicators of whether the respondent had medical coverage (of any type) in the previous month; and whether all dependent children had medical coverage (of any type) in the previous month); preventive health care use (binary indicators of whether the respondent had a health check-up since enrolment, had at least two dental visits in the past year and whether he/she was treated for any medical condition); unmet health care needs (two binary measures of whether the respondent did not have medical care because of cost in the past year and whether the respondent did not fill a prescription because of cost in the past year); financial wellbeing (financial wellbeing score and food security scale); and health behavior (binary indicator of whether the respondent was currently smoking). These factors were measured at 18 months for the self-rated health model and at 42 months for the state of hope model.

We used the Oaxaca command in Stata 14 (18), with the pooled option to estimate coefficients for the explained portion of the model. We used the program group as the referent group. We also used the detail option of the command to subsume coefficients in larger predictor categories as listed above.

Appendix Exhibit 4. Effect of the program on self-reported and corrected BMI at 18 months and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010

	18-month (N=3,082)			42-month (N=2,966)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
Average BMI	30.4	30.2	-0.2	30.4	30.1	-0.4
Corrected average BMI[a]	31.3	31.2	-0.1	30.7	30.3	-0.4

Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys.
Notes: All models control for selected baseline characteristics: age, gender, ethnic background, household primary language and parental level of education. Robust standard errors are clustered at the household level. Statistical significance levels are reported as *p*<0.10; **p*<0.05; ***p*<0.01; ****p*<0.001.
[a] Corrected BMI is based on NHANES height and weight values corrected for gender- and ethnicity-specific reported bias.

Appendix Exhibit 5. Selected sample characteristics at randomization, overall and by assignment status, Opportunity NYC-Family Rewards experiment, 2007-2010

	Overall	Program	Control
Parents (N=4,749)			
One-parent family (%)	80.90	80.48	81.37
Number of children under 19 (mean, SD)	2.49 (1.29)	2.47 (1.25)	2.50 (1.33)
Primary language spoken is English (%)	77.24	77.46	77
Household earnings above 130% of poverty line (%)	11.85	12.50	11.17
Receiving TANF [a] (%)	24.01	24.81	23.21
Receiving food stamps (%)	59.40	60.80	58.02
Receiving housing assistance [b] (%)	53.35	52.14	54.56
Primary parent			
Gender (%)			
Female	94.57	94.96	94.17
Male	5.43	5.04	5.83
Age (mean, SD)	38.85 (7.97)	38.85 (8.05)	38.85 (7.89)
Race/ethnicity (%)			
Hispanic/Latino	47.13	47.32	46.95
Black	50.53	50.74	50.34
Other	2.32	1.94	4.15
Education level (%)			
GED certificate [c]	11.20	9.95	12.45
High school diploma	20.72	19.66	21.80
Associate's degree/2-year college	8.56	8.75	8.36
4-year college or beyond	7.73	7.89	7.57
None of the above	51.79	53.74	49.82
Currently working (%)	51.14	49.90	52.40
Working more than 30 hours (%)	19.75	19.21	20.28
Average weekly earnings of those currently working [d] (mean, SD)	390.84 (221.25)	395.06 (219.4)	386.61 (223.06)
Health insurance coverage (%)			
Public health insurance	72.6	72.45	72.75
Employer health insurance	18.88	19.40	18.35
Other health insurance	2.77	2.75	2.79
Not covered	5.76	5.40	6.11
Had annual medical check-up when not sick			
Within the past year	81.69	81.98	81.30
1-2 years ago	14.53	14.07	14.99
More than 2 years ago	3.58	3.74	3.42
Never	0.25	0.21	0.29
Had preventive dental check-up			
Within the past year	64.83	64.96	64.70
1-2 years ago	23.50	23.89	23.10
More than 2 years ago	10.93	10.42	11.44
Never	0.74	0.73	0.76
Physical or mental health problem limiting work (%)	21.95	22.76	21.14
Self-rated health (%)			
Excellent or very good	43.46	43.26	43.67
Good	37.40	37.33	37.47
Fair or poor	19.14	19.41	18.86
Children (N=11,331)			
Gender (%)			
Female	49.95	49.86	50.14
Male	50.05	50.24	49.86
Age (mean, SD)	10.64 (4.26)	10.54 (4.3)	10.71 (4.22)
Race/ethnicity (%)			
Hispanic/Latino	46.98	46.97	46.48
Black	49.84	50.05	49.62
Other	3.18	2.53	3.90

Health insurance coverage (%)			
Public health insurance	81.07	81.12	81.03
Employer health insurance	14.51	14.97	14.04
Other health insurance	1.72	1.32	2.08
Not covered	2.70	2.59	2.85
Had annual medical check-up when not sick			
Within the past year	90.75	90.50	91.01
1-2 years ago	8.34	8.47	8.21
More than 2 years ago	0.75	0.80	0.70
Never	0.15	0.23	0.07
Had preventive dental check-up			
Within the past year	74.63	73.85	75.42
1-2 years ago	17.16	18.14	16.17
More than 2 years ago	3.06	2.93	3.19
Never	5.15	5.08	5.21
Physical or mental condition limiting work (%)	13.29	12.92	13.65
Parent's rating of child's health			
Excellent or very good	74.65	75.70	73.50
Good	21.84	21.07	22.62
Fair or poor	3.51	3.24	3.78

Sources: Data are from Family Rewards baseline survey. **Notes:** Percentages may not add up due to rounding.

[a] Temporary Assistance for Needy Families.
[b] This category includes living in public housing and receiving Section 8 rental assistance.
[c] General Education Development.
[d] Earnings from work, in 2007 US dollars.

Appendix Exhibit 6. Effect of the program on parental outcomes at 18 months and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010

	18-month (*N*=3,082)			42-month (*N*=2,966)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
Health insurance coverage						
Medical coverage in previous month (%)	94.3	95.3	1.0** (0.1, 2.0)	93.9	96.1	2.2** (0.3, 4.1)
All dependent children had coverage (%)	92.8	94.7	1.9** (0.3, 3.5)	93.9	95.3	1.4 (-0.8, 3.6)
Preventive health care use						
Seen personal doctor/health care provider in past 12 months (%)	80.2	84.1	3.9*** (2.7, 5.1)	95.4	95.5	0.1 (-1.1, 1.5)
At least two dental visits in the past year (%)	57.5	69.1	11.6*** (8.6, 14.5)	34.4	47.4	13.0** (9.4, 16.5)
Treated for any medical condition (%)	41.9	46.1	4.2*** (0.4, 8.0)	46.8	50.3	3.5 (-0.8, 5.6)
Used emergency room as usual source of care in past year (%)	4.9	3.2	-1.7** (-2.7, -0.7)	3.7	3.2	-0.5 (-1.8, 0.5)
Unmet health care needs						
No medical care because of cost in past 12 months (%)	9.2	6.3	-2.9*** (-4.0, -1.2)	8.1	5.1	-3.0** (-5.4, -0.3)
Did not fill prescription because of cost in past 12 months (%)	14.6	14.2	-0.4 (-2.2, 1.4)	10.9	12.4	1.5 (-1.9, 5.1)
Physical health						
Average self-rated health	3.05	3.2	0.15*** (0.11, 0.22)	3.0	3.1	0.13 (-0.01, 0.27)
Asthma (%)	15.3	17.4	2.1 (-0.1, 4.3)	16.5	16.7	0.2 (-2.8, 3.1)
Average BMI	30.4	30.2	-0.2 (-0.4, 0.2)	30.4	30.1	-0.3 (-1.2, 0.4)
High blood pressure (%)	20.4	21.2	0.8 (-1.7, 2.5)	24.8	26.2	1.4 (-3.8, 5.4)
High cholesterol (%)	8.6	9.7	1.1 (-0.8, 2.1)	10.3	10.7	0.4 (-2.8, 3.5)
Diabetes (%)	7.2	9.1	1.9 (-0.3, 2.8)	9.7	11.9	2.2 (-1.6, 4.9)
Currently smoking (%)	23.3	20.7	-2.6 (-3.1, 2.9)	23.3	20.8	-2.5 (-6.8, 1.9)
Mental health						
Average score on 'State of Hope' scale	17.3	17.5	0.2 (-0.1, 0.5)	17.5	17.9	0.51*** (0.2, 0.8)
Experience of serious psychological distress in the past month (%)	13.6	13.5	-0.1 (-2.6, 2.4)	-	-	-
Average score on k10 symptom scale	19.7	19.2	-0.5 (-1.6, 0.2)	-	-	-

Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys. **Notes:** A hyphen indicates that no data were available. All models controlled for selected baseline characteristics: age, gender, ethnic background, employment status, primary language and level of education. Robust standard errors were clustered at the household level. Statistical significance levels are reported as *p<0.10; **p<0.05; ***p<0.01; ****p<0.001. 95% confidence intervals in parenthesis.

Appendix Exhibit 7. Impact of the program on children outcomes at 18 months and 42 months Opportunity NYC-Family Rewards experiment, 2007-2010

	18-month (*N*=6,559)			42-month (*N*=6,464)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
Preventive health care use						
Has routine health care provider (%)	93.6	93.9	0.3 (-1.5, 2.1)	91.2	92.6	1.4 (-1.1, 4.0)
Has personal pediatrician (%)	92.3	92.5	0.2 (-2.2, 2.7)	88.3	87.7	-0.6 (-3.5, 2.3)
Had health check-up in the past year (%)	96.6	97.5	0.9 (-0.6, 2.5)	94.0	96.3	2.3 (-0.2, 4.4)
Had at least two dental visits in the past year (%)	60.5	72.3	11.8*** (6.1, 17.5)	48.3	62.9	14.6*** (9.5, 19.7)
Physical health						
Average children's health as rated by parents	3.82	3.87	0.05 (-0.04, 0.1)	3.8	3.9	0.1 (-0.05, 0.2)
Has any health condition (physical, mental or learning disability) (%)	28.2	27.2	-0.1 (-5.9, 2.6)	27.5	27.1	-0.4 (-4.6, 4.0)
Has an attention deficit disorder (%)	4.9	3.7	-1.2 (-3.4, 0.5)	3.6	3.1	-0.5 (-2.2, 1.3)
Has asthma (%)	10.8	10.2	-0.6 (-3.8, 2.1)	9.1	9.6	0.5 (-2.2, 3.5)
For children under 6						
Had physical examination in the past year (%)	97.1	97.6	0.6 (-2.8, 4.5)	96.2	99.0	2.8 (-1.4, 6.4)
Had a dental check-up in the past year (%)	64.2	73.5	9.3 (-0.5, 18.3)	61.3	63.7	2.4 (-10.9, 15.3)
Was screened for an early intervention program (%)	24.9	33.5	8.6 (-0.4, 16.8)	24.7	30.8	6.1 (-5.3, 15.7)

Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys.
Notes: All models controlled for selected baseline characteristics: age, gender, ethnic background, employment status, primary language and level of education. Robust standard errors were clustered at the household level. Statistical significance levels are reported as *p<0.10; **p<0.05; ***p<0.01; ****p<0.001. 95% confidence intervals in parenthesis.

Appendix Exhibit 8. Decomposition of the effect of Family Rewards on 'final' health outcomes at 18 and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010

A. Decomposition of the effect of the program on self-rated health at 18 months

	Coefficient	Standard error	z	P
Difference				
Treatment	3.24	0.03	122.01	0.00
Control	3.15	0.03	109.51	0.00
Difference	0.09	0.04	2.21	0.03
Explained				
Baseline characteristics	-0.01	0.01	0.66	0.51
Health insurance coverage	-0.01	0.00	0.19	0.85
Preventive care use[a]	0.03	0.01	-1.81	0.04
Unmet health care needs	0.00	0.00	1.43	0.15
Financial wellbeing	0.06	0.01	6.47	0.00
Smoking	-0.01	0.00	-0.02	0.98
Total	0.05	0.02	2.10	0.04
Unexplained				
Baseline characteristics	0.72	0.38	1.90	0.06
Health insurance coverage	-0.57	0.19	-3.06	0.00
Preventive care use	-0.20	0.13	-1.55	0.12
Unmet health care needs	-0.06	0.02	-3.71	0.00
Financial wellbeing	-0.04	0.17	-0.24	0.81
Health behavior	-0.04	0.06	-0.69	0.49
Total	0.04	0.03	1.26	0.21

B. Decomposition of the effect of the program on the 'State of Hope' scale at 42 months

	Coefficient	Standard error	z	P
Difference				
Treatment	17.95	0.09	204.71	0.00
Control	17.57	0.10	175.89	0.00
Difference	0.38	0.13	2.85	0.00
Explained				
Baseline characteristics	-0.04	0.03	-1.54	0.13
Health insurance coverage	-0.01	0.01	-0.79	0.43
Preventive care use[a]	0.08	0.03	2.90	0.00
Unmet health care needs	0.01	0.01	1.06	0.29
Financial wellbeing	0.12	0.05	2.51	0.01
Smoking	0.00	0.01	-0.51	0.61
Total	0.16	0.06	2.55	0.01

Unexplained				
Baseline characteristics	-4.37	1.53	-2.86	0.00
Health insurance coverage	-1.07	0.76	-1.41	0.16
Preventive care use	0.47	0.40	1.19	0.23
Unmet health care needs	0.04	0.05	0.88	0.38
Financial wellbeing	-1.71	0.57	-2.98	0.00
Health behavior	0.19	0.07	2.69	0.01
Total	0.22	0.13	1.76	0.08

Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys. **Notes**: The exhibit shows the regression-based decomposition results for the two outcomes of interest: self-rated health at 18 months (panel A) and 'State of Hope' score at 42 months (panel B). The first rows of the tables show the difference in outcome score between treated and control. The second sets of rows show the contribution of each individual factor to the difference explained by measured factors (the 'explained' portion). The final sets of rows show the portion of the difference that is not explained by measured variables (the 'unexplained' portion). For example, in Panel A, the total difference between treated and control groups in self-rated health at 18 months is 0.09 (3.24 minus 3.15). Of this difference, 56% is explained by measured individual factors (0.05/0.09*100). The 'explained' section of the table details the relative contribution of each variable to this explained difference. For example, Panel A indicates that financial wellbeing accounts for 67% of the explained difference in self-rated health between treated and control (0.06/0.09*100).

[a]Preventive health care use is a composite measure based on binary indicators of whether the respondent had seen their personal doctor or health care provider in the past 12 months, had at least two dental visits in the past year, had the emergency room as usual source of care in past year, and whether he/she was treated for any medical condition in the past year.