

Cash transfer during the COVID-19 pandemic: a multicentre, randomised controlled trial

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ABSTRACT

Objective To evaluate the effect of a one-time cash transfer of \$C1000 in people who are unable to physically distance due to insufficient income.

Design Open-label, multi-centre, randomised superiority trial.

Setting Seven primary care sites in Ontario, Canada; six urban sites associated with St. Michael's Hospital in Toronto and one in Manitoulin Island.

Participants 392 individuals who reported trouble affording basic necessities due to disruptions related to COVID-19.

Intervention After random allocation, participants either received the cash transfer of \$C1000 (n=196) or physical distancing guidelines alone (n=196).

Main outcome measures The primary outcome was the maximum number of symptoms consistent with COVID-19 over 14 days. Secondary outcomes were meeting clinical criteria for COVID-19, SARS-CoV-2 presence, number of close contacts, general health and ability to afford basic necessities.

Results The primary outcome of number of symptoms reported by participants did not differ between groups after 2 weeks (cash transfer, mean 1.6 vs 1.9, ratio of means 0.83; 95% CI 0.56 to 1.24). There were no statistically significant effects on secondary outcomes of the meeting COVID-19 clinical criteria (7.9% vs 12.8%; risk difference -0.05; 95% CI -0.11 to 0.01), SARS-CoV-2 presence (0.5% vs 0.6%; risk difference 0.00 95% CI -0.02 to 0.02), mean number of close contacts (3.5 vs 3.7; rate ratio 1.10; 95% CI 0.83 to 1.46), general health very good or excellent (60% vs 63%; risk difference -0.03 95% CI -0.14 to 0.08) and ability to make ends meet (52% vs 51%; risk difference 0.01 95% CI -0.10 to 0.12).

Conclusions A single cash transfer did not reduce the COVID-19 symptoms or improve the ability to afford necessities. Further studies are needed to determine whether some groups may benefit from financial supports and to determine if a higher level of support is beneficial.

Trial registration number NCT04359264.

INTRODUCTION

Physical or social distancing, maintaining distance between individuals and avoiding gatherings by closing or reducing attendance

Key points

Question

► Physical distancing is a mainstay of controlling the COVID-19 pandemic but an insufficient income may make it difficult to remain at home, income increases could promote health during a pandemic by facilitating physical distancing.

Finding

► A \$C1000 cash transfer did not reduce exposure to COVID-19 based on symptoms or laboratory testing, but it did reduce COVID-19 symptoms in the pre-specified subgroup of those older than 50 who were more likely to have symptoms.

Meaning

► The findings suggest income supports targeted at those at higher risk of COVID-19 may be beneficial and that future evaluations could focus on older adults.

at school and work, is effective at curbing the spread of epidemics based on systematic reviews of observational and modelling studies.¹ Physical distancing during the COVID-19 pandemic was associated with reductions in COVID-19 spread between countries,²⁻⁴ but risk varies within countries based on individual characteristics such as racialisation and income.⁵⁻⁸

Income increases could promote health during a pandemic by facilitating physical distancing. In the USA, lower-income individuals were the most mobile group after state COVID-19 emergency declarations but the least mobile group prior based on mobile device location data.⁹ Modelling studies suggest that paid sick leave can reduce the spread of influenza-like illnesses by promoting adherence to physical distancing.^{10 11} Income supplements might also generally mitigate harms of pandemic related disruptions associated with unemployment or insufficient



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incomes. Multiple studies in a variety of settings have found that health is associated with income in general,¹² and a pilot study of a basic income in Finland found improvements in reported health.¹³ Systematic reviews of cash transfers in low-income and middle-income countries indicate that they may improve some surrogate health outcomes.¹⁴ Many governments have made massive investments in cash transfers to individuals during the COVID-19 pandemic, but the effects of these income supports and the appropriate amount to provide are not known.

We conducted a randomised controlled trial to assess the effect of unconditional cash transfer on COVID-19 symptoms in residents of Ontario, Canada, who reported trouble affording basic necessities due to pandemic related disruptions.

METHODS

Study design

This was an open-label randomised multicentre superiority trial with blind outcome assessors.

Participants

There was a single inclusion criterion that was based solely on patient report. To be eligible, participants had to report trouble ‘making ends meet’ or affording basic necessities due to COVID-19-related disruptions. We excluded individuals who were previously confirmed positive for COVID-19 based on laboratory testing or had symptoms consistent with COVID-19. Patients were approached during in-person or virtual clinical encounters at seven primary care sites in Ontario, Canada (population 14.6 million); there were six urban sites associated with St. Michael’s Hospital in Toronto and one in Manitoulin Island. We also recruited personal support workers, who generally earn a low income and come in close contact with clients, through an email notice distributed by employers.

Randomisation

Participants were allocated in a 1:1 ratio to either a cash transfer or control using web-based central randomisation in the REDCap electronic case report forms application. The allocation schedule was computer generated, stratified by centre and blocked using randomly permuted blocks of two and four.

Procedures

Participants randomised to the intervention group received an unconditional cash transfer of \$C1000 or \$C1200 for individuals living in households of three or more, via electronic transfer or bank draft. Both intervention and control group participants received information about reducing the spread of COVID-19 from the Public Health Agency of Canada over the phone and via email (see online supplemental appendix). After determining

eligibility and randomisation, participants and care providers were aware of the allocated intervention.

Outcomes

The primary outcome was the maximum count of symptoms consistent with COVID-19 over days 5, 10 and 14 as listed in the InFLUenza Patient-Reported Outcome (FLU PRO) instrument.¹⁵ A total of 32 items in six domains (nose, throat, eyes, respiratory, gastrointestinal and systemic) were scored as present or absent on each of days 5, 10 and 14; the highest symptom count recorded on a single day of days 5, 10 and 14 was used for analysis. The presence or absence of symptoms was recorded rather than symptom severity ratings that was required to analyse the originally specified continuous primary outcome of the maximum FLU PRO score over days 5, 10 and 14. This change to the primary outcome was made after data lock but before analysis of outcome data.

We added a secondary outcome deemed more specific for COVID-19, defined as the number of participants who met the case definition of probable COVID-19 as adapted from the US Council of State and Territorial Epidemiologists case definition of probable COVID-19 (see online supplemental appendix).¹⁶ Additional secondary outcomes were the self-reported number of close non-household contacts, PCR-confirmed COVID-19 based on nasopharyngeal swab, self-reported health, ability to make ends meet or afford basic necessities, food security and ability to afford medicines. The number of close non-household contacts was assessed on days 5, 10 and 14. All other secondary outcomes were assessed on day 14. We used a validated question to assess self-reported general health: ‘In general, how would you rate your health today?’. Possible responses were ‘very good’, ‘good’, ‘moderate’, ‘bad’ or ‘very bad’.^{17 18} To determine financial security, we used the following validated question: ‘At the end of the month, are you able to make ends meet?’.¹⁹ We used three validated questions to ask about food insecurity with three possible responses for each question: often true (worst food insecurity), sometimes true and never true (no food insecurity). As in previous food insecurity studies, responses of either ‘often’ or ‘sometimes’ were considered affirmative for food insecurity.²⁰ Ability to afford medicines was assessed using one validated question about not taking prescribed medicines due to their cost, with participants being classified as adherent or non-adherent.²¹

Statistical analysis

The original sample size consideration was based on the maximum FLU PRO score as continuous primary outcome assessed across days 5, 10, 14. We required 176 participants per group to achieve 80% power to detect a difference in means of 0.21 on the FLU PRO, from 0.70 in the control group to 0.49 in the experimental group, at a two-sided alpha of 0.05, assuming an SD of 0.70 based on a previous study of individuals with influenza-like illness.¹⁵ Assuming 10% lost to follow-up, we recruited a

total of 392 participants or 196 in each group. A sample size reconsideration for the new primary outcome using PASS Power Analysis and Sample Size Software V.15.0.10 (NCSS, Kaysville, Utah, USA) based on the observed mean count of symptoms of 1.94 in the control group indicated that the sample size of 392 participants would yield 90% power to detect a ratio of mean counts of 0.50, corresponding to a 50% relative reduction in symptom count, 82% power to detect a ratio of mean counts of 0.55, 71% power to detect a ratio of mean counts of 0.60, 59% power to detect a ratio of mean counts of 0.65 and 45% power to detect a ratio of mean counts of 0.70, corresponding to a 30% relative reduction in symptom counts, at a two-sided alpha of 0.05 after taking into account a 10% lost to follow-up. For all sample size considerations, the overdispersion parameter, defined as the ratio of the variance divided by the mean count, was set at 6.53, as observed in our data.

The primary analysis of the primary outcome was performed in the intention-to-treat (ITT) population, where patients who had at least one follow-up assessment at days 5, 10 or 14 days were analysed in the group they were randomly allocated to. We used bootstrapped Poisson regression analysis (1000 bootstrapped samples with replacement) to assess the superiority of the single unconditional cash transfer over control and expressed the treatment effect using between-group ratio of mean counts with 95% bootstrapped CI. In order to determine

if results of the primary analysis were sensitive to the handling of missing data, we used both inverse probability weighting and fit a mixed-effects repeated measures model. Secondary outcomes were also analysed in the ITT population. Binary outcomes were compared between groups using risk differences with 95% CIs, and χ^2 tests to derive two-sided p values. Count outcomes were analysed using rate ratios from quasi-Poisson models with 95% CIs and two-sided p values, which were adjusted for baseline values whenever available. Prespecified subgroup analyses of the primary outcome accompanied by tests of interaction were done according to age (<50 or \geq 50) and sex using bootstrapped Poisson regression. Finally, we conducted two sensitivity analyses of the primary outcome to assess robustness of results using inverse probability weighting in a quasi-Poisson regression analysis and a generalised Poisson mixed-effects model. Analyses were done in Stata V.15.1 (Stata) and R V.3.6.1 (R Foundation, Vienna, Austria).

RESULTS

Between 20 April 2020 and 15 May 2020, we screened 491 potentially eligible individuals, and enrolled and randomly allocated 392, 196 to the cash transfer arm and 196 to the control arm, (figure 1). Two participants withdrew consent, both in the control arm (1%). Six

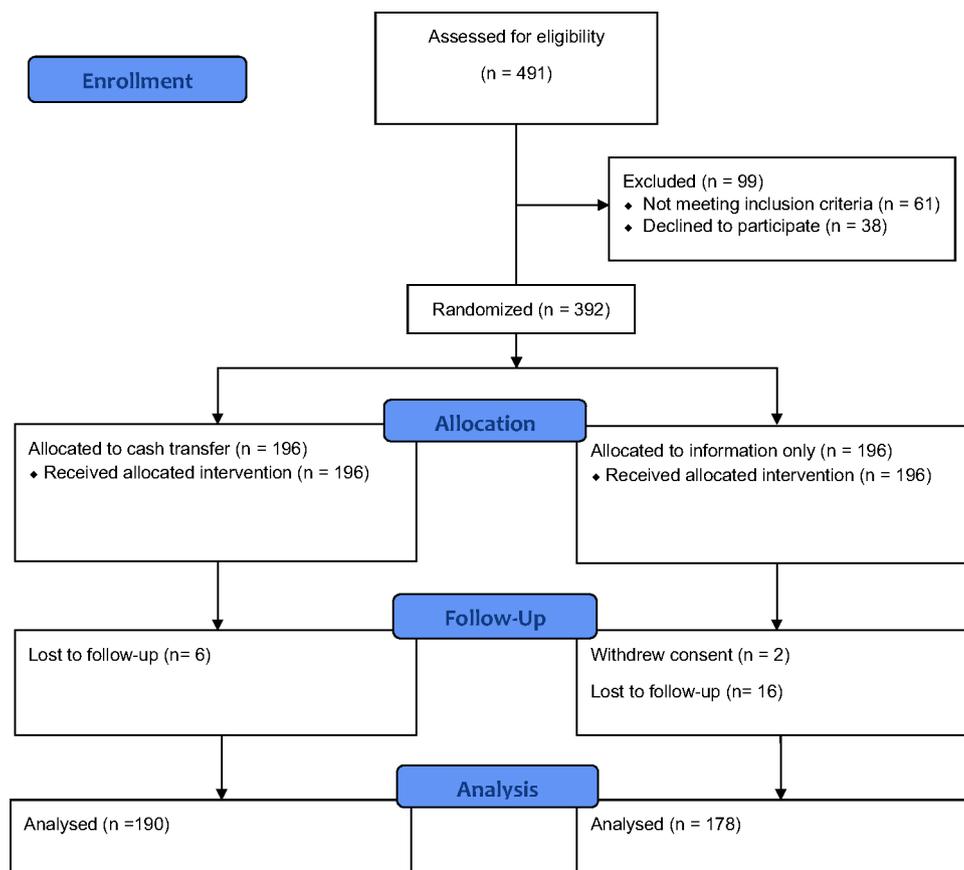


Figure 1 Consolidated Standards of Reporting Trials (CONSORT) flow diagram.

Table 1 Baseline characteristics

	Cash transfer (N=196)	Control (N=196)
Women, n (%)	124 (63)	139 (71)
Age, mean (SD)	44 (12)	45 (13)
Ethnicity, n (%)		
White	82 (42)	83 (43)
Black	78 (40)	67 (34)
Other	36 (18)	46 (23)
Main income source, n (%)		
Wages	111 (57)	113 (58)
Pension	9 (4.6)	12 (6.2)
Social support	45 (23)	33 (17)
Unemployment insurance	26 (13)	26 (13)
Other	3 (2)	11 (6)
Household income, n (%)		
<\$C30k	133 (68)	135 (69)
\$C30–\$C100	56 (29)	53 (27)
>\$C100k	2 (1)	2 (1)
COVID-19 income support, n (%)	64 (33)	72 (37)
Household members, mean (SD)	2.4 (1.6)	2.5 (1.5)
Close non-household contacts at baseline, mean (SD)	1.7 (3.4)	1.9 (4.5)

participants in the cash transfer arm (3%) and 16 in the control arm (8%) were lost to follow-up.

The trial population consisted of mostly women (67%) and most participants self-identified as either white (42%) or black (37%) (table 1). The average age was 44±12 years. Most participants (69%) had an income below \$C30 000. In the cash transfer group, 115 (59%) had 2 or fewer household members and so received \$C1000 while 81 (41%) participants had 3 or more household members and so received \$C1200.

When the trial started the number of new confirmed COVID-19 cases in Ontario (606 new cases per day, or 4 per 100 000 population) was near its first peak, and the rate of new confirmed cases later decreased but was sustained (above 294 per day, 2 per 100 000) during the study period. Closures of schools, child care facilities, some non-essential workplaces, restaurants, indoor and outdoor recreational facilities were enforced during the study period. Available governmental income supports included a \$C2000 benefit every 4 weeks for some with an income disruption, and 35% (136) of participants reported receiving some COVID-19 income supports at baseline.

Effects of the interventions

The cash transfer did not lower the symptom count up to 2 weeks (cash transfer 1.6±3.0 vs 1.9±3.8; ratio of means

0.83; 95% CI 0.56 to 1.24, $p=0.34$; table 2). Similar results were found when handling missing data using inverse probability weighting (ratio of means 0.84; 95% CI 0.56 to 1.24) and a mixed-effects model (ratio of means 0.83; 95% CI 0.51 to 1.35). In prespecified subgroup analyses, there was no difference between females (ratio of means 0.83; 95% CI 0.38 to 1.80) and males (ratio of means 0.87; 95% CI 0.55 to 1.39) ($p=0.91$ for interaction), but cash transfers reduced the symptom count in those aged 50 years or older (ratio of means 0.50; 95% CI 0.30 to 0.82), but not in those <50 years (ratio of means 1.45; 95% CI 0.82 to 2.55) ($p=0.005$ for interaction; figure 2).

There were no statistically significant differences in secondary outcomes (table 2). There was no difference in the percentage of patients who met the clinical definition of probable COVID-19 (cash transfer 15/190 (8%) vs 23/180 (13%), risk difference 0.05 95% CI -0.11 to 0.01; $p=0.12$). Only one participant (0.5%) in the cash transfer and one participant in the information only group (0.6%) had PCR-confirmed COVID-19 during the study period. There was no evidence of a difference between groups in the number of close contacts outside of the household (mean number of non-household close contacts 3.5±5.9 vs 3.7±6.8; rate ratio 1.10 95% CI 0.83 to 1.46). General health did not differ between groups after 2 weeks (60% vs 63%). In both groups, around half of participants reported the inability to make ends meet or afford basic necessities at the end of the study (52% vs 51%). Optional comments made by participants indicated that many who reported the ability to make ends meet were only 'barely' making ends meet (see online supplemental appendix). Food insecurity was not reduced by cash transfers (80% vs 71%). Non-adherence to medicines due to financial reasons was relatively infrequent in the study population with no evidence for a difference between groups (11% vs 12%).

DISCUSSION

In this randomised controlled trial, a cash transfer to financially vulnerable people during the pandemic neither reduced the primary outcome, symptom count up to 2 weeks, nor did it improve the secondary outcomes of general health or the ability to afford basic necessities. A prespecified subgroup analysis indicated that there might be a benefit of a cash transfer in those aged 50 years or older. The hypothesis that a cash transfer is beneficial in financially vulnerable people aged 50 years or older should be tested in future randomised trials.

There are at least four potential explanations for the lack of an observed benefit of a cash transfer in this trial: cash transfers may truly be unhelpful in this context, the risk of SARS-CoV-2 exposure may have been too low in the trial population to observe an effect of the intervention, the studied single cash transfer may have been insufficient, or a potential benefit in those aged 50 years or older was diluted or cancelled out by a lack of benefit or even harm in those aged less than 50 years. Factors

Table 2 Outcomes

	Cash transfer	Control	Difference (95% CI)	P value‡
	N=190	N=180		
Symptom count*, mean (SD)	1.6 (3.0)	1.9 (3.8)	RoM, 0.83 (0.56 to 1.24)	0.34
	N=190	N=180		
Case definition of probable COVID-19†, n (%)	15 (8)	23 (13)	RD, -0.05 (-0.11 to 0.01)	0.12
	N=190	N=180		
PCR-confirmed COVID-19, n (%)	1 (0.5)	1 (0.6)	RD, 0.00 (-0.02 to 0.02)	1.00
	N=190	N=180		
Close non-household contacts, mean (SD)	3.5 (5.9)	3.7 (6.8)	RR, 1.10 (0.83 to 1.46)	0.52
	N=185	N=174		
General health (very good or excellent), n (%)	110 (60)	109 (63)	RD, -0.03 (-0.14 to 0.08)	0.54
	N=184	N=172		
Ability to make ends meet, n (%)	96 (52)	88 (51)	RD, 0.01 (-0.10 to 0.12)	0.85
	N=185	N=174		
Food insecurity, n (%)	147 (80)	124 (71)	RD, 0.08 (-0.01 to 0.18)	0.071
	N=185	N=174		
Non-adherence to medicines due to financial reasons, n (%)	21 (11)	21 (12)	RD, -0.01 (-0.08 to 0.06)	0.83

*Primary outcome.

†Case definition of probable COVID-19 based on signs and symptoms adapted from the US Council of State and Territorial Epidemiologists case definition of probable COVID-19.

‡P values are based on Poisson regression for symptom count and close contacts; χ^2 tests for case definition of probable COVID-19, general health, ability to make ends meet, food insecurity and non-adherence to medicines due to financial reasons; and Fisher's exact test for PCR-confirmed COVID-19. The number of close non-household contacts was adjusted for baseline number of contacts. RD, risk difference; RoM, ratio of means.

other than financial security may be more important determinants of exposure to SARS-CoV-2 and adherence to physical distancing guidelines. Studies of cash transfers and ongoing income supports have generally found small benefits in some outcomes and no effect on other outcomes.^{13 14} Trust in government and other authorities is associated with adherence to physical distancing

guidance.^{22 23} All participants were provided with information about physical distancing and respiratory hygiene and this reminder might have improved adherence.

Assuming that approximately 1 out of 10 cases was detected and confirmed by PCR during the study period,²⁴ the risk of SARS-CoV-2 during the trial may have been around 5%. However, only one participant in

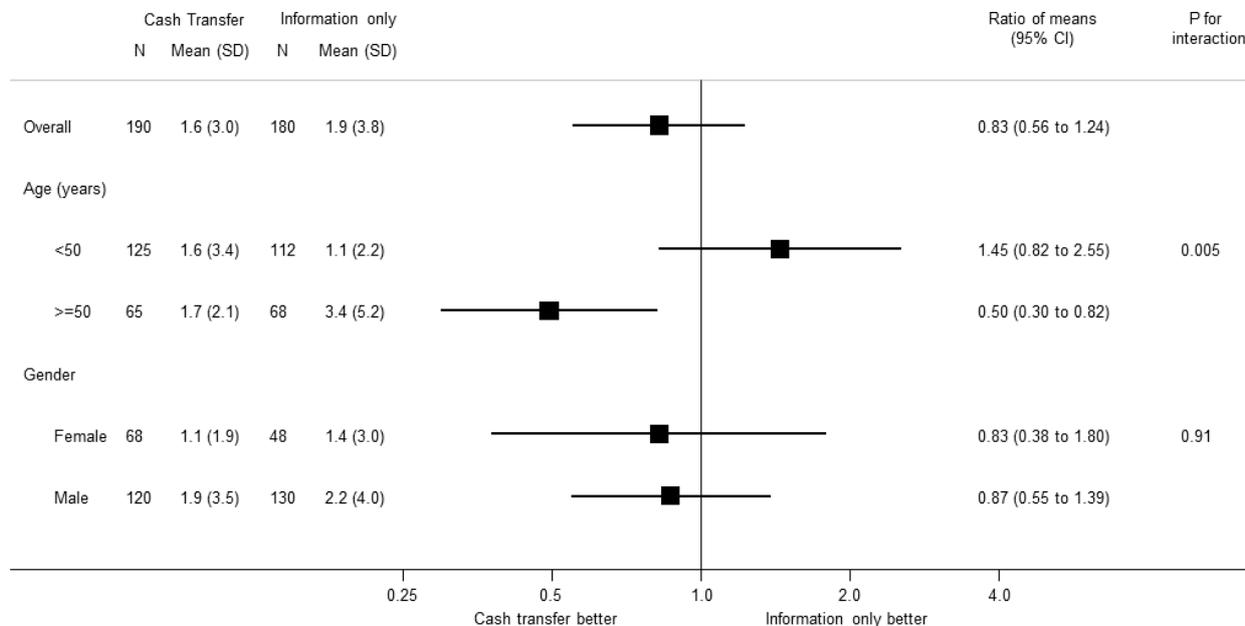


Figure 2 Prespecified analyses of the primary outcome by age and gender

each group had PCR-confirmed COVID-19, and our trial was not powered to detect differences in PCR-confirmed cases. Since there was an apparent benefit in participants 50 years or older, in whom symptom counts were larger than in younger participants, future trials could focus on older individuals, or individuals at even higher risk than those included in this trial.

The single cash transfer may not have provided sufficient financial security, and \$1000 to \$1200 may have been insufficient to substantially benefit participants. Work-related exposure to SARS-CoV-2 may not have been affected by a single cash transfer. Around half of participants reported the inability to make ends meet and most expressed concerns about food insecurity regardless of the cash transfer. This was true despite the fact that approximately one third of participants also received government supports (that were often worth \$C2000 per month). The cost of living for a family of four in Toronto, Ontario, was estimated at \$C3508 per month in 2018 and this is approximately equal to the combined value of the cash transfer in this study and the typical government support.²⁵ The lack of an improvement in the ability to make ends meet in this study is notable because a trial of free medicine provision, that typically decreased expenses by less than \$C200 per month, substantially improved the ability to make ends meet in a similar trial population.²⁶

This is a rare trial of a non-pharmaceutical intervention during a pandemic conducted around the peak of new reported cases near the start of the pandemic. An evaluation of a single cash transfer programme in New York City during the pandemic indicated that the money was used to purchase basic necessities, but health outcomes were not assessed.²⁷ We assessed both outcomes related to SARS-CoV-2 spread and outcomes related to personal and financial well-being.

This trial has several limitations. Trials of cash transfers cannot be blinded. The short study period meant that antibody testing would not be reliable, and it was not feasible to repeatedly test participants for presence of the novel coronavirus due to a limited supply of PCR testing when the trial was conducted. The sample size could have been insufficient to detect an important benefit; these trial results would ideally be pooled with results from similar studies. The primary outcome was based on symptom score developed for influenza and not COVID-19 although the symptoms are similar and we also employed a COVID-19 probable case definition. The long-term effects of a cash transfer cannot be determined based on a trial of a single cash transfer with a 2-week follow-up period. Results from a study in a high-income country with substantial social supports, including publicly funded healthcare services, should be applied with caution to other contexts.

Primary care providers can help ensure people have access to basic necessities by taking action at the individual patient, practice and community levels.²⁸ Primary care providers can also use their knowledge of the challenges patients face to contribute to broader changes by leading or supporting studies that assess the effects of

potential policy changes such as cash transfers that may promote health.

CONCLUSION

A cash transfer did not substantially reduce exposure to COVID-19 or improve the ability to afford necessities in a randomised controlled trial. These results indicate that the effects of cash transfers—that can represent substantial expense to governments—should be carefully assessed. The benefits might be greater in those at higher risk including those 50 years or older. To enable future pragmatic randomised comparisons, governments providing financial assistance could randomly assign some individuals to additional amounts geared to the cost of living while tracking outcomes to determine if financial supports have their intended benefits, such as allowing people to afford basic necessities.

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Contributors NP made contributions to the study conception and design, literature search, data collection, analysis and interpretation, created the figures and drafted the manuscript; PJ and BRdC made contributions to the study conception and design, data analysis and interpretation, and drafted the manuscript. All authors revised the drafted manuscript critically for important intellectual content. All authors are accountable for all aspects of the work. NP accepts full responsibility for the work and the conduct of the study, had access to the data and controlled the decision to publish.

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Supplementary materials

This supplementary material has been provided by the authors to give readers additional information about their work.

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Contributors and members of the study team

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Symptoms

- Runny or dripping nose
- Nose congested or stuffy
- Sneezing
- Sinus pressure
- Scratchy or itchy throat
- Sore or painful throat
- Difficulty swallowing
- Teary or watery eyes
- Sore or painful eyes
- Eyes sensitive to light
- Trouble breathing
- Chest congestion
- Chest tightness
- Dry or hacking cough
- Wet or loose cough
- Coughing
- Coughed up mucus or phlegm
- Felt nauseous (feeling like you wanted to throw-up)
- Stomach ache
- Vomit
- Diarrhea
- Felt dizzy
- Head congestion
- Headache
- Lack of appetite
- Sleeping more than usual
- Body aches or pains
- Weak or tired
- Chills or shivering
- Felt cold
- Felt hot
- Sweating

Probable Covid-19 definition

At least two of the following symptoms:

- feeling cold (fever)
- chills or shivering
- body aches or pains
- headache,
- sore or painful throat,
- nausea or vomiting,
- diarrhea,
- weak or tired,
- runny or dripping nose or nose congested or stuffy

OR

Any one of the following symptoms:

- coughing or coughing up mucous or phlegm,
- chest congestion,
- trouble breathing,

Comments about ability to “make ends meet” or afford necessities

A total of 189 (189/392, 48 %) participants commented on their ability to make ends meet.

Table. Numbers of comments provided by group of allocation and reported ability to make ends meet.

	Cash transfer	Information only	Total
Yes, can make ends meet	56/96 (58%)	46/88 (52%)	184/392 (47 %)
No, cannot make ends meet	40/88 (45%)	47/84 (56%)	172/392 (44%)
Total	96/184 (52%)	93/172 (54%)	356/392 (91%)

Many, 23/102 (23%), of the comments from participants who indicated they could make ends meet indicated that they could only “barely” do so or were “just scraping by”, and another 19/102 (19%) indicated they could make ends meet but it was difficult to do so. Some stated they were able to make ends meet because of government financial assistance related to the COVID-19 pandemic. Others reported dipping into savings to buy essentials. Some had lower expenses due to daycare closures.

Among those who reported not being able to make ends meet, comments often referenced job loss or reduced work hours due to COVID-19 or needing to stay home from work with children due to COVID-19 as the cause, though some mentioned that they were never able to make ends meet due to low income and high costs of living. Some reported increased expenses due to COVID-19 such as increased prices of food and household items, buying more food to feed children at home, using taxis or ride-sharing rather than taking public transit and having to buy masks and sanitizer. Some reported not being able to afford rent or groceries, or incurring credit card debt to pay bills.

Some (11/96, 11%) participants in the cash transfer group who provided comments stated that they were able to make ends meet because of the money they received from the study.