


# Exploring Why Financial Incentives Fail to Affect At-home Colorectal Cancer Screening: a Mixed Methods Study



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**BACKGROUND:** Despite success in increasing other health behaviors, financial incentives have shown limited to no effect on colorectal cancer (CRC) screening. Little is known about the factors shaping why and for whom incentives improve screening.

**OBJECTIVE:** To explore the perspective of participants enrolled in a larger, four-arm pragmatic trial at urban family medicine practices which assessed and failed to detect significant effects of financial incentives on at-home CRC screening completion.

**DESIGN:** We performed a mixed methods study with a subset of randomly selected patients, stratified by study arm, following completion of the pragmatic trial.

**PARTICIPANTS:** Sixty patients (46.9% enrollment rate) who were eligible and overdue for colorectal cancer screening at the time of trial enrollment and who continued to receive care at family medicine practices affiliated with an urban academic health system completed the interview and questionnaire.

**MAIN MEASURES:** Using Andersen's behavioral model, a semi-structured interview guide assessed motivators, barriers, and facilitators to screening completion and the impact of incentives on decision-making. Participants also completed a brief questionnaire evaluating demographics, screening beliefs, and clinical characteristics.

**KEY RESULTS:** The majority of patients ( $n=49$ ; 82%) reported that incentives would not change their decision to complete or not complete CRC screening, which was confirmed by qualitative data as largely due to high perceived health benefits. Those who stated financial incentives would impact their decision ( $n=11$ ) were significantly less likely to agree that CRC screening is beneficial (72.7% vs 95.9%;  $p<0.05$ ) or that CRC could be cured if detected early (63.6% vs 98.0%;  $p<0.05$ ).

**CONCLUSIONS:** Financial incentives are likely not an effective behavioral intervention to increase CRC screening for all but may be powerful for increasing short-term benefit and therefore completion for some. Targeting financial incentive interventions according to patient screening beliefs may prove a cost-effective strategy in primary care outreach programs to increase CRC screening.

**KEY WORDS** Colorectal cancer screening; Financial incentives; Mixed methods research; Population health; Primary care

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## INTRODUCTION

Colorectal cancer (CRC) is the second leading cause of US cancer death.<sup>1</sup> Failing to receive or stay current on CRC screening increases mortality risk over two-fold,<sup>2</sup> yet nearly one-third of the US population aged 50 to 75 years old did not have a current CRC screening test in 2016.<sup>3</sup> Direct mailing of a fecal immunochemical test (FIT) to patients has proven to increase screening<sup>4</sup> but has not become widely adopted practice in part due to potential resource costs.<sup>5</sup>

As a behavioral health intervention, financial incentives can increase a variety of health behaviors<sup>6</sup> and have been applied to FIT programs to increase efficiency and response. However, incentives have had limited success in increasing CRC screening with most trials indicating no effect<sup>7–9</sup> and some finding modest effects<sup>10,11</sup> or effects only in conjunction with other interventions.<sup>12</sup> Targeting incentive programs according to patient risk or likely response is increasingly recognized as cost-effective practice, including for CRC screening.<sup>13–16</sup> Little is known, however, about why and for whom financial incentives may succeed from the perspective of patients.<sup>17</sup> We conducted a mixed methods study<sup>18</sup> embedded within a pragmatic randomized controlled trial<sup>19</sup> in order to explore why financial incentives often fail to increase rates of CRC screening and identify whether certain patient contexts and characteristics might improve their efficacy.

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## METHODS

From August to November 2018, we conducted an embedded mixed methods study<sup>18</sup> with primary care patients at an urban, academic health system who were enrolled in a 4-arm randomized pragmatic clinical trial which evaluated and failed to detect significant effects of financial incentives on mailed FIT completion.<sup>19</sup> The governing institutional review board approved all activities.

### Participants

At trial enrollment (December 2015–July 2017), participants were aged 50–75 years and overdue for CRC screening ( $n = 897$ ).<sup>19</sup> Eligible patients received a mailed FIT kit and were randomized to one of four parallel arms to receive (1) no financial incentive; (2) an unconditional \$10 incentive included with the mailing; (3) a \$10 incentive conditional on FIT completion; or (4) participation in a lottery with a 1-in-10 chance of winning \$100 conditional on FIT completion. Completion rates were not statistically superior among any of the incentive arms compared to the active control arm.<sup>19</sup>

Following trial completion, we invited a subset of eligible participants via mailed letter and follow-up telephone call to complete a one-time, semi-structured interview and questionnaire. We randomly identified and invited patients in batches, stratified by trial arm, until reaching data saturation. We chose to randomize and stratify sampling by trial arm to enhance variation of intervention exposure, primarily to understand how different financial incentives within the trial did or did not work.<sup>20</sup> We contacted 369 patients and reached 128; of these, 71 agreed to participate, and 60 completed the interview, 15 per trial arm. To assess for representativeness, we compared the enrolled sample ( $n = 60$ ) to each of the following groups: the overall trial sample ( $n = 897$ ), the randomly selected recruitment sample ( $n = 369$ ), those contacted for recruitment but not reached ( $n = 241$ ), and those reached but not enrolled ( $n = 68$ ). We found no significant differences by age or race/ethnicity ( $p < 0.05$ ). For sex, males represented a significantly higher proportion of those contacted but not reached (46.5%) than of those who enrolled (31.7%;  $p = 0.038$ ). There were no other significant differences by sex between groups.

### Data Collection

As an embedded mixed methods study,<sup>21</sup> domains of interest were identified *a priori* at the time of the pragmatic trial to understand why and how each of the four interventions, particularly the use of financial incentives, succeeded or failed to change behavior and improve FIT completion. We planned to quantify certain results, taking advantage of

validated questionnaires where available, to speak to existing literature;<sup>22–26</sup> where less relevant literature existed, we planned exploratory analysis and used open-ended questions. Utilizing convergent parallel design,<sup>21</sup> we aligned domains across data collection tools (interview guide and questionnaire) to triangulate qualitative and quantitative findings. To evaluate how patient-level factors shaped mailed FIT completion, we developed a semi-structured interview guide using Andersen's behavioral model<sup>27</sup> including open- and closed-ended questions examining views on financial incentives and other facilitators or barriers to screening (see Online Supplement). Andersen's behavioral model is a health services access and utilization framework which models individual care access and use as a function of the following three factors: predisposing factors, such as social structure and demographics; enabling factors, including personal, family, and community; and perceived and evaluated need factors.<sup>27</sup> Participants also completed a brief questionnaire evaluating demographics,<sup>22</sup> health,<sup>23</sup> screening history,<sup>24</sup> provider communication,<sup>25</sup> and screening beliefs using previously validated measures.<sup>26</sup> The questionnaire was verbally administered to participants at the time of the interview. Following verbal consent, trained research staff with no prior relationship to participants from the Mixed Methods Research Lab (MMRL) at the University of Pennsylvania conducted the interviews with eligible participants in-person or by phone (depending on participant preference). Interviews lasted 25–30 min on average, were audio-recorded, and were transcribed verbatim. All participants received \$20.

### Data Analysis

We analyzed the qualitative data using the constant comparative method, guided by modified grounded theory.<sup>18</sup> We utilized *a priori* domains of interest based on Andersen's behavioral model and inductively explored emergent themes within and across participants.<sup>18,27</sup> We conducted a round of open coding on a subset of 4 interviews to identify initial themes. We then developed a coding dictionary guided by conceptual model (deductive codes) and themes identified during open coding (inductive codes) which included index, parent thematic, and child thematic codes with rules for each code type. All codes were applied at the question level for consistency. Two trained coders applied the refined codebook to the interview set, each coding 35 of the 60 interviews using NVivo, with 10 interviews independently double-coded by both coders. Overall inter-rater reliability was calculated on the double-coded interviews ( $\kappa = 0.7$ ), and we produced summary thematic reports. We then conducted targeted secondary analysis to quantify patient response by incentive impact. Two analysts independently coded the individual responses to the open incentives question and had 93.3% agreement; the discordant responses were resolved

by a third reviewer. We conducted descriptive and bivariate analyses of quantitative data (Stata version 15.1, Stata Corp LP), using concurrent methods to triangulate quantitative patterns with qualitative data.<sup>18</sup>

**RESULTS**

**Patient Characteristics**

The median age of participants was 60 years, and most were female (68%), non-Hispanic Black (68%), and without a

**Table 1 Participant Characteristics by Self-Reported Incentive Impact on CRC Screening: Predisposing Factors in Andersen’s Belief Model (ABM)<sup>a</sup>**

Participant characteristic	All (N=60)	By incentive impact	
		No impact (n=49)	Impact (n=11)
<i>Demographics</i>			
Age in years, mean (SE)	60 (1)	60 (1)	61 (1)
Male sex, no. (%)	19 (32)	16 (33)	3 (27)
Race/ethnicity, no. (%)			
NH Asian	2 (3)	1 (2)	1 (9)
NH Black	41 (68)	33 (67)	8 (73)
NH White	17 (28)	15 (31)	2 (18)
Highest education completed, no. (%)			
Grade school	2 (3)	2 (4)	0 (0)
High school	30 (50)	24 (49)	6 (55)
College degree	28 (47)	23 (47)	5 (46)
Annual income, no. (%) (missing = 15)			
<\$25,000	13 (22)	9 (18)	4 (36)
\$25,000 < \$50,000	10 (17)	8 (16)	2 (18)
\$50,000 or higher	22 (37)	20 (41)	2 (18)
Employment status, no. (%)			
Employed	30 (50)	24 (49)	6 (55)
Unemployed	16 (27)	13 (27)	3 (27)
Retired	14 (23)	12 (25)	2 (18)
Relationship status: partnered, no. (%) (missing = 2)	23 (38)	17 (35)	6 (55)
CRC screening preference: FIT, no. (%)	36 (60)	30 (61)	6 (55)
Returned mailed FIT in trial, no. (%)	34 (57)	29 (59)	5 (46)
<i>CRC screening beliefs</i>			
C1: Colon cancer screening makes sense to me, no. (% agree)	55 (92)	45 (92)	10 (91)
C2: I will be just as healthy if I avoid having colon cancer screening, no. (% disagree)	32 (53)	27 (55)	5 (45)
C3: Having colon cancer screening is an important thing for me to do, no. (% agree)	53 (88)	44 (90)	9 (82)
C4: Having colon cancer screening can help to protect my health, no. (% agree)	55 (92)	47 (96)*	8 (73)*
E1: When colon cancer is found early, it can be cured, no. (% agree)	55 (92)	48 (98)*	7 (64)*
N1: I want to do what my doctor/health professional thinks I should do about colon cancer screening, no. (% agree)	48 (80)	40 (82)	8 (73)
N2: I want to do what members of my immediate family think I should do about colon cancer screening, no. (% agree)	18 (30)	15 (31)	3 (27)
N3: Members of my immediate family think I should have colon cancer screening, no. (% agree)	30 (50)	24 (49)	6 (55)
N4: My doctor/health professional thinks I should have colon cancer screening, no. (% agree)	55 (92)	44 (90)	11 (100)
S1: The chance that I might develop colon cancer is high, no. (% agree)	6 (10)	6 (12)	0 (0)
S2: Compared with other persons my age, I am at lower risk for colon cancer, no. (% disagree)	20 (33)	17 (35)	3 (27)
S3: It is very likely that I will develop colon cancer, no. (% agree)	6 (10)	6 (12)	0 (0)
W1: I am afraid of having an abnormal colon cancer screening test result, no. (% agree)	29 (48)	24 (49)	5 (46)
W2: I am worried that colon cancer screening will show that I have colon cancer, no. (% agree)	13 (22)	12 (25)	1 (9)

<sup>a</sup>Table describes participant characteristics following the predisposing factors domain within Andersen’s behavioral model (ABM). Significant differences by incentive impact ( $p < 0.05$  using Fisher’s exact test) are denoted with an asterisk (\*). Numbers may not sum to group totals or percentages to 100% due to missingness

<sup>b</sup>Higher belief indicates agreement with the statement unless otherwise indicated. Each statement assesses one of five constructs related to CRC screening: C, coherence; E, perceived efficacy; N, social norms; S, perceived susceptibility; or W, worry

college degree (53%). Over half (60%) preferred mailed FIT to colonoscopy or sigmoidoscopy (Tables 1 and 2).

## Impact of Incentives

The majority of respondents ( $n=49$ ; 82%) reported incentives would not change their decision to complete a FIT (Table 1); 12% of these ( $n=6$ ) had never been screened for CRC using any modality. Those participants who reported incentives would impact their screening behaviors ( $n=11$ ) were significantly less likely to agree that CRC screening is beneficial (72.7% vs 95.9%;  $p<0.05$ ) or that CRC is curable if detected early (63.6% vs 98.0%;  $p<0.05$ ), and nearly half ( $n=5$ ; 46%) had never been screened (Table 3).

Qualitative data supported the quantitative findings and clarified how financial incentives shape FIT decisions (Table 4).

**No Impact on Decision** Patients who stated incentives would not impact their decision-making largely reported they would complete the FIT regardless. These patients primarily cited their health as a driver of screening decisions, with financial incentives viewed as a bonus. Some, however, could never be financially motivated to complete the FIT, either because they preferred another screening method or would not participate in CRC screening regardless.

**Impact on Decision** Among respondents who reported a financial incentive would impact their screening decision, several indicated they would return the FIT kit more quickly. Many noted, however, that any influence would depend on the amount, with suggestions varying from \$10 to \$500.

**Motivators, Barriers, and Facilitators** To better understand how financial incentives impact decision-making, we assessed cross-cutting motivators, barriers, and facilitators to FIT completion (Table 5).

**Motivators** Most commonly, respondents discussed personal beliefs, such as health preservation, mortality reduction, health scares, and known risk factors. Other motivators included the ease of mailed FIT and provider recommendation.

**Barriers** While not every patient reported barriers, the most commonly mentioned were personal factors, such as forgetting or losing the test or being too busy or ill. Some indicated they would delay or not complete the test because they felt healthy or feared the results. Structural issues, including cost and difficulty accessing a post office, were common. Respondents also mentioned test-related factors, particularly disgust, embarrassment, or reliability concerns; disgust was particularly common among those who indicated financial incentives would impact their decision-making.

**Table 2** Participant Characteristics by Self-Reported Incentive Impact on CRC Screening: Perceived and Evaluated Need and Enabling Factors (ABM)<sup>a</sup>

Participant characteristic	All ( $N=60$ )	By incentive impact	
		No impact ( $n=49$ )	Impact ( $n=11$ )
<i>Perceived and evaluated need (ABM)</i>			
Smoking status: currently smokes, no. (%) (missing = 2)	14 (23)	9 (18)	5 (46)
Self-reported health, no. (%)			
Excellent/very good	42 (70)	35 (71)	7 (64)
Fair/poor/very poor	18 (30)	14 (29)	4 (36)
Non-CRC cancer history, no. (%)	10 (17)	7 (14)	3 (27)
Never been screened for CRC, no. (%)	11 (18)	6 (12)*	5 (46)*
<i>Enabling factors (ABM)</i>			
Provider ever recommended CRC screening, no. (%)	56 (93)	45 (92)	11 (100)
Provider discussed CRC screening benefits, no. (%)	52 (87)	43 (88)	9 (82)
Provider discussed CRC screening harms, no. (%)	33 (55)	29 (59)	4 (36)
Recall receiving mailed FIT within the last year, no. (%)	39 (65)	34 (69)	5 (46)
Reported cost as barrier to seeing provider, no. (%)	11 (18)	7 (14)	4 (36)
Had routine checkup within the last year, no. (%)	52 (87)	43 (88)	9 (82)
Insurance coverage, no. (%)			
Private	28 (47)	23 (47)	5 (46)
Medicaid or Medicare	28 (47)	22 (45)	6 (55)
None/unsure	4 (7)	4 (8)	0 (0)

<sup>a</sup>Table describes participant characteristics following the domains within Andersen's behavioral model (ABM). Significant differences by incentive impact ( $p<0.05$  using Fisher's exact test) are denoted with an asterisk (\*). Numbers may not sum to group totals or percentages to 100% due to missingness

**Table 3 Joint Display of Screening Beliefs by Impact of Financial Incentives on the Decision to Complete or Not Complete a FIT Kit**

Quantitative		Qualitative
Validated belief measure	Percent that agree by incentive impact	Patient perspective illustrative quotations
Having colon cancer screening can help to protect my health	No impact on decision (95.9% agree)	“I’ve had friends that have gone through this thing, and family, and I said I do not want to go what they went through.... If I have a chance that I can prevent whatever may come, then I want to do so” (Black, male, age 56).
	Impact decision (72.7% agree)	“It wasn’t a priority on my list, so I didn’t do it” (White, female, age 56). “I don’t know that much about it.... I haven’t heard that much about colorectal cancer” (Asian, female, age 56).
When colon cancer is found early, it can be cured	No impact on decision (98.0% agree)	“You get in front of certain things and you get a much better chance of surviving, rather than getting behind it” (Black, male, age 62). “Basically, making sure that everything’s okay, and if it’s something that has to be taken care of in the early stage, I know we caught it in time” (Black, female, age 57).
	Impact decision (63.6% agree)	“If I think I don’t have any problem, I’d probably be real slow about it” (Black, male, age 69).

**Facilitators** The main facilitator mentioned was direct outreach, encompassing provider recommendation, education, and reminders. Preferred medium varied, including text message, email, telephone, mail, and in-person reminders. Many also discussed handoff issues, preferring to receive or complete the kit at their provider’s office.

**DISCUSSION**

While financial incentives have had limited to no success in improving at-home CRC screening rates to date, this intervention has proven an effective strategy to improve other health behaviors. As Moller and colleagues suggest,<sup>28</sup> a better understanding of the factors motivating patients’ responses to financial incentives may identify patient contexts and characteristics which improve the efficacy of

financial incentive programs. This study provides novel insight from the patient perspective into such factors, including indication that differing beliefs and motivations may require tailored intervention approaches to be most effective.

The majority of participants (49; 82%) indicated that financial incentives would not impact their decision to complete the FIT kit or not. These patients typically reported being motivated to complete the FIT regardless of financial incentives due to desires to stay healthy and follow doctor recommendations, which comported with higher perceived health benefits of screening and belief in the curability of CRC if detected early. While the mechanisms by which financial incentives could be effective vary by individual (e.g., cue to action), these findings suggest that financial incentives may not increase screening for most patients. Common barriers such as forgetfulness, busyness, mailing difficulties, and costs could be addressed

**Table 4 Joint Display on the Impact of Financial Incentives on Patient Decision to Complete or Not Complete a FIT Kit**

Quantitative	Qualitative		
Incentive impact	Theme	Patient perspective illustrative quotations	
No impact on decision (n = 49)	Complete regardless	“At this point, the incentive is that I wanna live longer” (Black, female, age 70). “It’s something I was going to do anyway because of my doctor’s recommendation” (Black, female, age 52). “I don’t think it would make a difference because it’s to my benefit... that I am taking care of my health” (White, female, age 64).	
		Incentive a bonus	“Everybody likes money, but it wouldn’t be my rationale for doing it... Because I was gonna do it anyway, any money that was there was just a plus” (Black, female, age 56). “A financial incentive would be nice but it would not be the primary determining factor” (White, male, age 71).
		Not complete regardless	“I don’t think you can create any type of monetary compensation to make me comfortable with something I don’t wanna do” (Black, female, age 53).
Impact decision (n = 11)	Depends on amount	“Well, I didn’t do this for the \$20.... Everybody has a price. Let me put it that way. If you said, ‘I’ll give you \$100,’ then, with certainty, I’ll just do it for \$100” (White, male, age 62).	
	Do it faster	“I would get it done faster.... It’s not something I’m looking forward to. I’m not fond of feces. I’m allergic. Any time I go near anything dirty, I just can’t stand it because I have allergies” (Asian, female, age 56).	



**Table 5 Thematic Analysis Summary with Illustrative Participant Quotations on Cross-Cutting FIT Kit Motivators, Barriers, and Facilitators**

Theme	Subtheme	Illustrative quotation
Motivators	Beliefs or knowledge	“I don’t wanna wait too long and then find out that I have some kind of cancer and waited too long, and then it’s gone too far and then it can’t be helped” (Black, female, age 57, no impact on decision).
		“The fact that it has been 10 years since my last test, that having found polyps in my colon that the possibility of cancer was at least slightly increased” (White, male, age 62, impact decision).
		“That’s why I went and did it, because of the doctor, my age, then thinking about the things that my father went through.” (White, male, age 62, no impact).
	Test-related factors	“It was simple. It was easy. Everything I needed was there” (Black, female, age 56, no impact).
Barriers	Outreach	“I basically do what my doctor asks of me to do” (Black, female, age 57, no impact).
	Personal factors	“I was scared of the results. Actually, I was nervous to find out if I had it or not. It was a decision I had to make. I decided I wouldn’t do it.” (Black, male, age 68, no impact).
		“I forgot. I was busy. Yeah, I don’t know. Sometimes life gets in the way, you put the kit in a drawer and then you find it six months later” (White, female, age 53, no impact).
		“I would probably have to ask for compensation if I had to put it through the mail.... Yeah, that’s embarrassing” (Asian, female, age 56, impact).
	Test-related factors	“I think it’s gross. I just can’t. You guys went through all of that schooling to get your MD’s after your name, why not just let me get the colonoscopy” (Black, female, age 54, impact).
		“I’m concerned with perhaps—I might contaminate the slide.... I’m not a health professional so that’s not something I wanna do” (Black, male, age 60, no impact).
		“... what would prevent me from sending it back is if I had to pay for it. And... if my insurance didn’t pay for it and it did have to come out of pocket, then of course, that’s a whole other story” (Black, female, age 55, impact).
	Structural factors	“... if it was something that was gonna cost me money, I would probably say—It would go through a very, very intensive screening because that would need juggling money and transportation to work and a lot of things. So, if it became a financial cost to me, it would probably hit bottom unless there were something painning me. There’d have to be something going on where I was thinking, ‘Oh, gee. This is unusual. There’s blood in my stool. Oh my God, I better do something.’” (Black, female, age 65, no impact).
Hand-off factors		“I do have problems with my mail. If there was one sent, then, that maybe could be what happened. I lost a lot of stuff here in the mail, Christmas presents, all kinds of things....” (White, female, age 71, no impact).
Facilitators	Outreach	“Just by talking to me about it and explaining it to me would make it easy for me” (Black, female, age 52, impact).
		“The first time that we talked about the screening, I thought to myself, ‘Well, that might be something that I should do.’ So, I thought about it. Then, I think I got a reminder and then I remembered, ‘Oh yeah, I gotta do that.’ ...And I became more invested in following through” (Black, female, age 65, no impact).
		“A notification that the FIT test is going to be sent.... That works really well for me.” (White, female, age 53, no impact).
		“The reminder calls are excellent, that was the best thing they ever invented” (Black, female, age 62, impact).
	Hand-off factors	“If you’re already there in an appointment, then they could do whatever right there so that there’s less running around.” (White, female, age 56, impact).
		“They can hand me the packet in the office.... I get so much garbage in the mail. It’s spam, spam, spam. I try to get rid of it before it even comes in the house” (Black, female, age 57, no impact).

through frequently mentioned facilitators, such as enhanced outreach, reminders, in-clinic hand-off of FIT kits, and reimbursement for any costs. Such interventions may not be effective, however, among the subset of participants who reported that financial incentives would not influence their decision but have never been screened (6/49; 12%). Previous research has examined persistent barriers to CRC screening, such as fear of results,<sup>29–31</sup> but further investigation into such barriers among this predominately Black, urban population may be productive.

Participants who responded that incentives would influence decision-making (11; 18%) also reported lower perceived benefits of screening and ability to cure CRC if detected early. These beliefs may contribute to the group’s higher likelihood of never before being screened using any

modality. Here, bolstering the effect of the cross-cutting facilitators mentioned above, financial incentives may influence patient decisions because these patients do not perceive many benefits to FIT completion and thus lack intrinsic motivation.<sup>28</sup> Substantial financial incentives may be required, however, to sufficiently increase perceived benefit-to-effort ratio and to avoid the “peanuts” effect, where incentives are perceived as too small given a high-stakes context, such as one’s health, and subsequently undermine motivation.<sup>32</sup> For example, of the subset of patients who reported never being screened but that incentives would impact their decision (5/11; 46%), none completed the FIT during the trial despite being randomized to receive a financial incentive; this may be because the incentive was too low.<sup>19</sup>

## Limitations

This study has limitations, including use of self-reported data subject to recall or social desirability bias and sampling from a patient cohort at a single academic center. Participants differed significantly by sex from those who were contacted to participate but not reached; thus, participant beliefs and responses may differ in meaningful ways from those unreached and from those who decided not to participate in this study. Study participants were not significantly different, however, than the overall pragmatic trial participants in sex, age, or race/ethnicity, enabling contextual insight that can broadly help to explain why financial incentives did not succeed for most participants in the trial.

## CONCLUSION

Findings indicate financial incentives in colorectal screening programs may impact patient decision-making to complete screening differently based on certain beliefs, with most patients indicating that incentives do not influence decisions. Future studies evaluating the impact of financial incentives should consider stratifying by baseline screening beliefs and history to further evaluate differential impact across patient screening beliefs. This may more accurately identify strategies to improve the targeting and cost-effectiveness of mailed FIT outreach programs, particularly financial incentive interventions, thus increasing the uptake of overall CRC screening.

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**Data availability** The quantitative datasets analyzed during the current study are available from the corresponding author on reasonable request. Given the challenges of fully de-identifying qualitative data, the raw data cannot be shared publicly. However, the authors are open to

sharing summary data on a case-by-case basis as allowed by human subjects policies.

## Declarations

**Conflict of Interest** Dr. Mehta has received an honorarium from the American Gastroenterological Association. No other conflicts declared.

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