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# **M-TICS: A study to assess the effectiveness of SMS-based interventions to increase participation in a population-based colorectal cancer screening program**

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# Background

The current method for inviting the target population to participate in population-based cancer screening programs is by postal mail.

Short message service (SMS) based interventions are widely used in healthcare and have shown promising results to improve cancer screening programs.



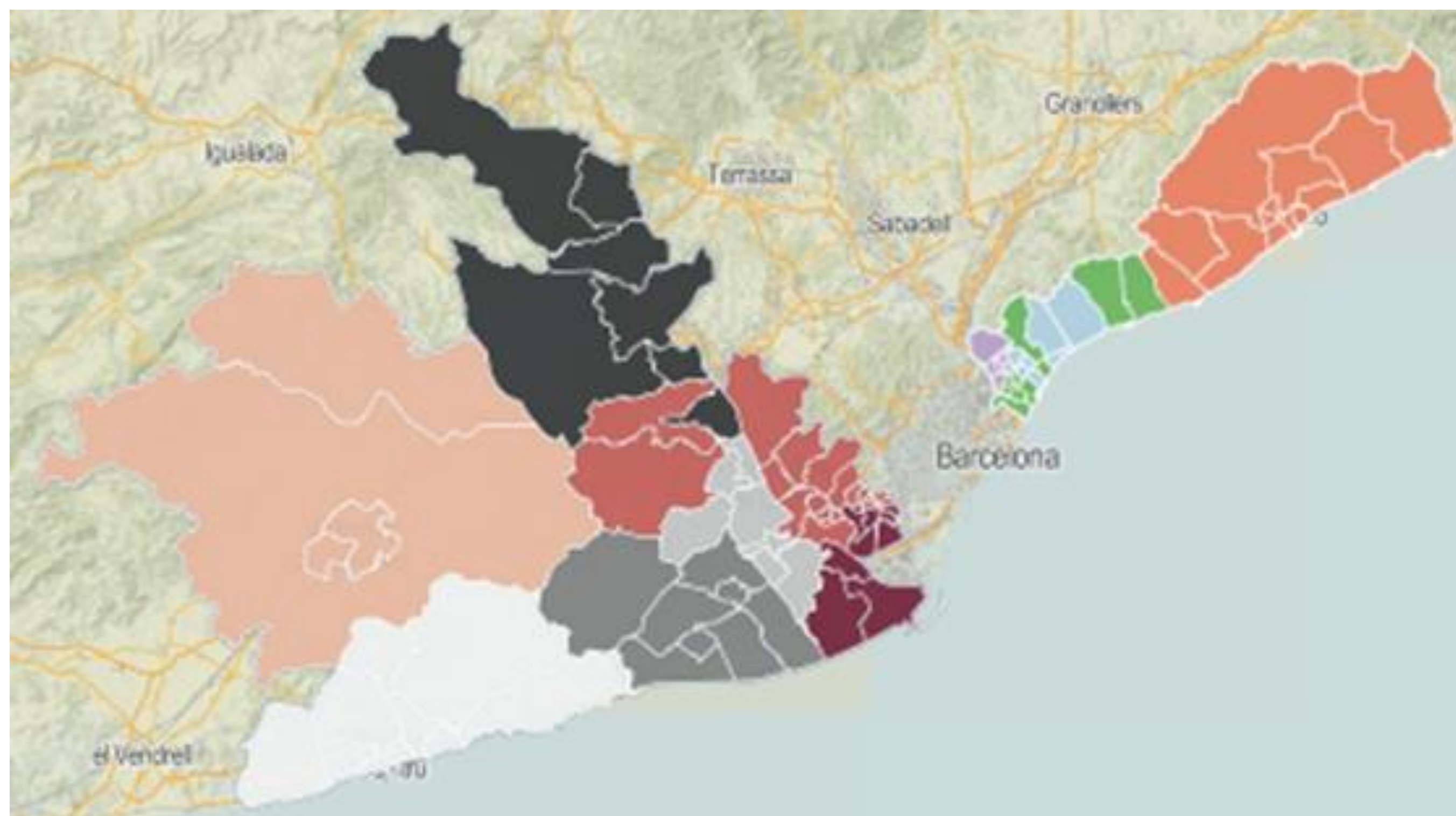
# Objectives

- ❑ To assess the effectiveness of an SMS-based intervention to increase participation in the current CRC screening program of the Metropolitan Area of Barcelona.
- ❑ To assess participants' perceptions and experiences of an implemented SMS-based intervention.
- ❑ To analyze the cost-effectiveness of adding an SMS-based intervention to CRC screening program within one year.



# Catalan Institute of Oncology Screening Hub





Screening invitations are sent according to primary healthcare areas (territorial divisions through which primary health care services are organized) – 97 PHA

Individuals pick up the fecal immunochemical test (FIT) at the pharmacy



# Methods



## Randomized Controlled Trial

Text messaging as a tool to improve cancer screening programs .

Vives N, Farre A, Ibáñez-Sanz G, Vidal C, Binefa G, Milà N, Pérez-Lacasta MJ, Travier N, Benito L, Espinàs JA, Bagaria G, Garcia M. Text messaging as a tool to improve cancer screening programs (M-TICS Study): A randomized controlled trial protocol. PLoS One. 2021 Jan 22;16(1):e0245806.

CRC screening invitation  
reminder

Reminder to complete and  
return FIT

Invitation method for  
previously screened women  
BC screening



# Methods

**Study population:** Individuals who have picked up a FIT kit at the pharmacy and they have not returned it after 14 days

**Intervention:** SMS reminder to complete and return the FIT vs standard procedure (no reminder)

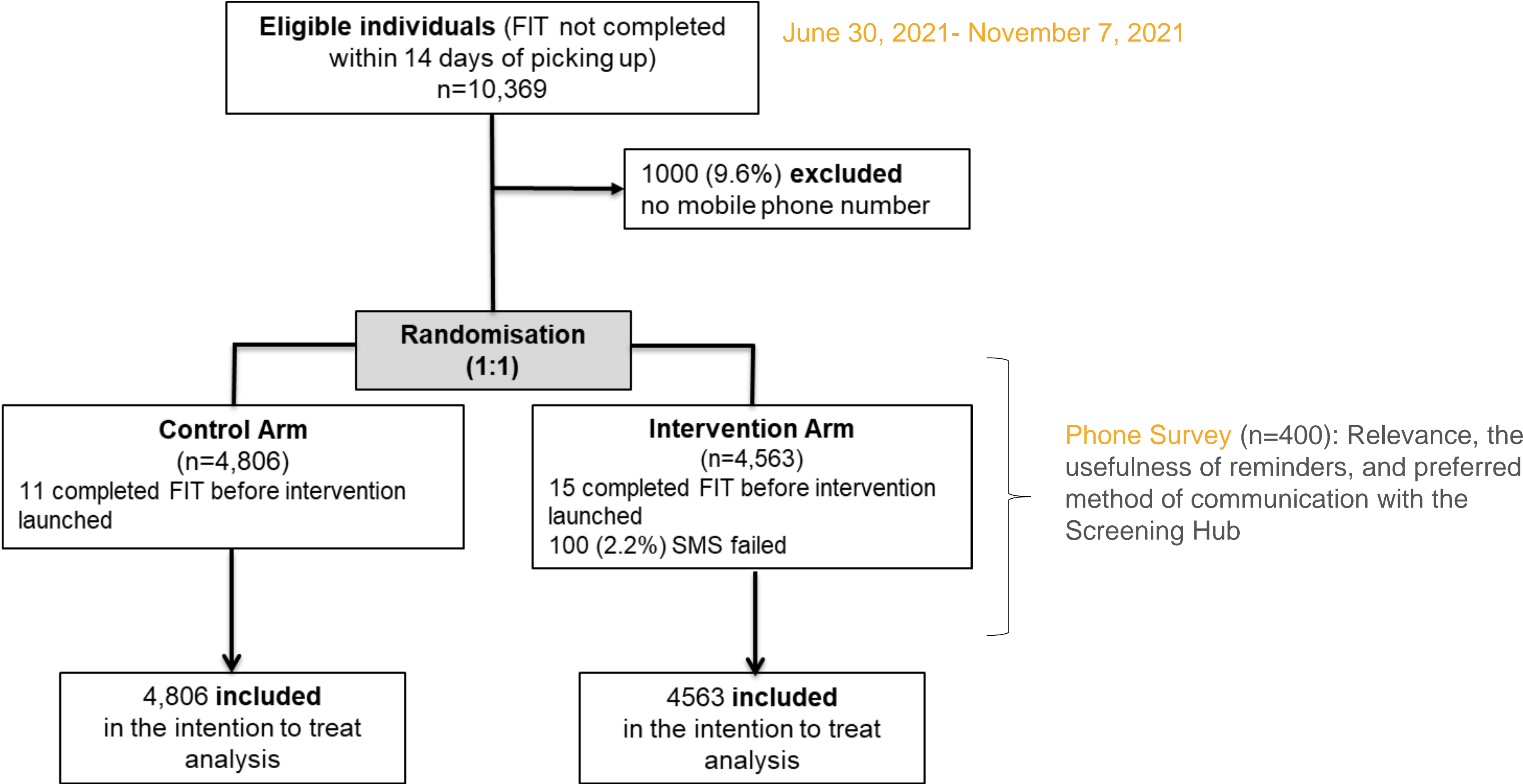
**Outcome:** immediate participation (at 30 days) and final participation (at 18 weeks).

**Other variables:** sex, age, previous screening behavior, deprivation index (score: 0-100; Higher scores on this index represent greater socioeconomic deprivation)



# Methods

## Study Flow-chart





# Results

## Baseline characteristics of the study population

|                       | Intervention | Control     | <i>P value</i> | Total       |
|-----------------------|--------------|-------------|----------------|-------------|
|                       | n (%)        | n (%)       |                | n (%)       |
| Sex                   |              |             |                |             |
| Female                | 2310 (50.6)  | 2482 (51.6) | 0,324          | 4792 (51.2) |
| Male                  | 2253 (49.4)  | 2324 (48.4) |                | 4577 (48.9) |
| Age, mean (SD), years | 57.6 (5.6)   | 57.6 (5.6)  |                | 57.6 (5.6)  |
| Age groups, years     |              |             |                |             |
| 50-59                 | 3084 (67.6)  | 3219 (67)   | 0,53           | 6303 (67.3) |
| 60-69                 | 1479 (32.4)  | 1587 (33)   |                | 3066 (32.7) |
| Deprivation Score     |              |             |                |             |
| 1st tertile           | 2696 (59.1)  | 2888 (60.1) | 0,528          | 5584 (59.6) |
| 2nd tertile           | 1078 (23.6)  | 1124 (23.4) |                | 2202 (23.5) |
| 3rd tertile           | 789 (17.3)   | 794 (16.5)  |                | 16.9 (16.9) |
| Previous screening    |              |             |                |             |
| No                    | 2018 (44.2)  | 2103 (43.8) | 0,649          | 4121 (44)   |
| Yes                   | 2545 (55.8)  | 2703 (56.2) |                | 5248 (56)   |
| <b>Total</b>          | <b>4563</b>  | <b>4806</b> |                | <b>9369</b> |



# Results

FIT completion rate among individuals that pick up a FIT kit at the pharmacy and after 14 days have not returned it

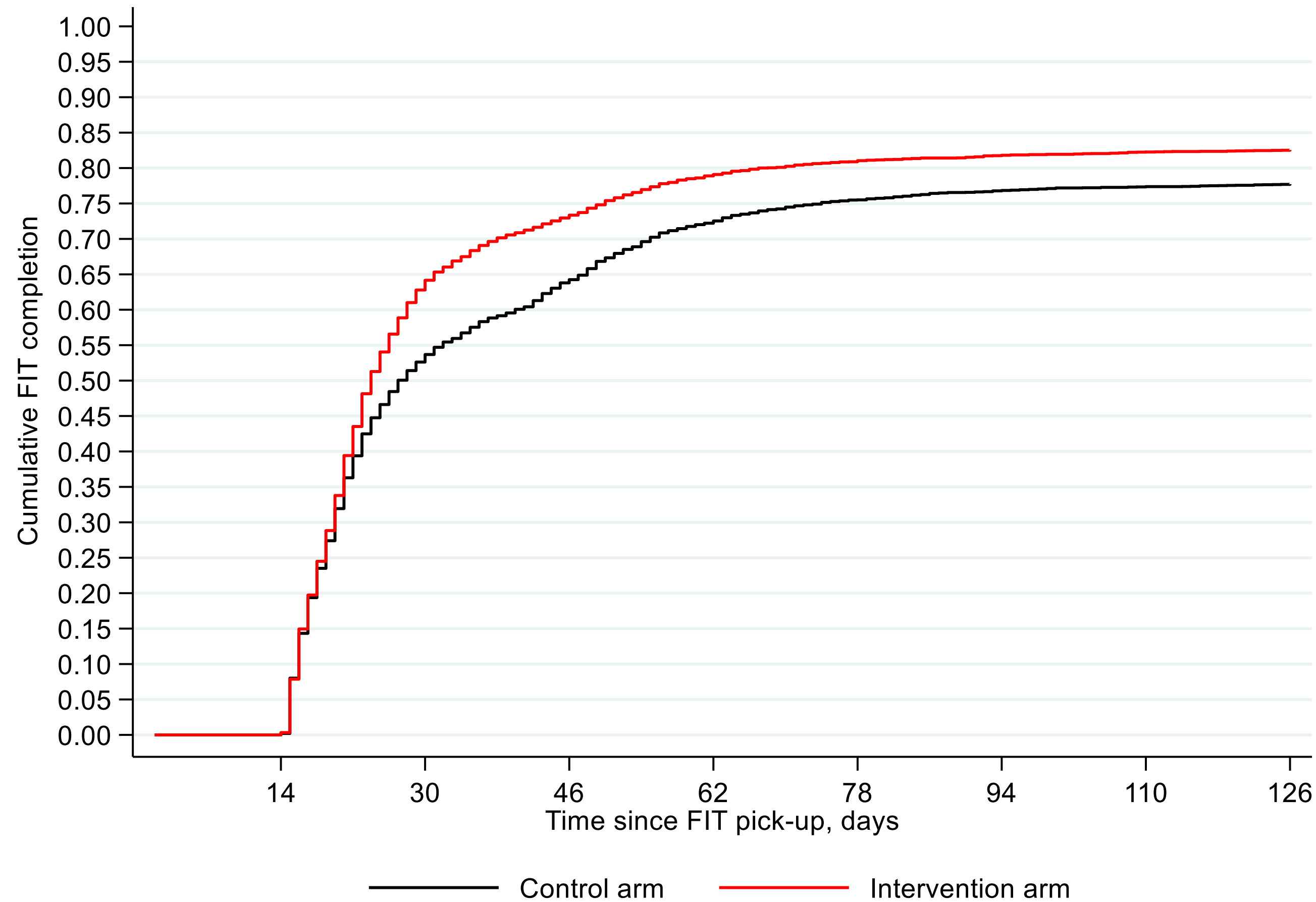
|                 | <b>Intervention<br/>(n=4563)</b> | <b>Control<br/>(n=4806)</b> | <b>Absolute difference<br/>in FIT completion rate</b> | <b><i>p value</i></b> |
|-----------------|----------------------------------|-----------------------------|---|-----------------------|
|                 | n (%)                            | n (%)                       | Points (95% CI)                                       |                       |
| Within 30 days  | 2928 (64.2)                      | 2580 (53.7)                 | 10.49 (10.47-10.51)                                   | <0.001                |
| Within 126 days | 3767 (82.6)                      | 3736 (77.7)                 | 4.82 (4.79-4.85)                                      | <0.002                |

93% of respondents found receiving a reminder from the screening hub helpful, and only 5.3% stated that they preferred the letter to communicate with the screening hub.



# Results

## Cumulative FIT completion



## Final participation (at 18 weeks)

|                           |             | FIT completion within 126 days |
|---------------------------|-------------|--------------------------------|
|                           |             | Adjusted HR (95% CI)           |
| <b>Intervention</b>       |             |                                |
|                           | Control     | 1                              |
|                           | SMS         | 1.21 (1.16-1.27)               |
| <b>Sex</b>                |             |                                |
|                           | Male        | 1                              |
|                           | Female      | 1.1 (1.05-1.15)                |
| <b>Age groups, years</b>  |             |                                |
|                           | 50-59       | 1                              |
|                           | 60-69       | 1.04 (0.99-1.09)               |
| <b>Deprivation Score</b>  |             |                                |
|                           | 1st tertile | 1                              |
|                           | 2nd tertile | 1 (0.95-1.06)                  |
|                           | 3rd tertile | 0.97 (0.91-1.03)               |
| <b>Previous screening</b> |             |                                |
|                           | No          | 1                              |
|                           | Yes         | 1.81 (1.72-1.9)                |



# Discussion

- ❑ Targeted SMS-based interventions addressed to population subgroups with greater motivation to participate in the programs, such as those individuals who pick up the FIT kit at the pharmacy, are more likely to be successful than strategies addressing to all non-participants.
- ❑ Time to FIT completion can also be shortened
- ❑ Findings from the process evaluation show that individuals mostly agree to receive SMS reminders from the CRC screening program.



# Acknowledgments

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