



Stepwise strategy to improve cervical cancer screening adherence (SCAN-Cervical Cancer)

Report for: *USF Espaço Saúde*

1| Rationale for the investigation

Cervical cancer is the fifth most common cause of cancer death in women (Portugal), and organized screening programs are important for its prevention and control. However, the population adherence in *Porto Ocidental* is just over 30%. The previously described interventions that intended to increase the adherence to cervical cancer screening targeted essentially hard-to-reach women and did not test low-cost or automated strategies.

2| Study description

Objective: to assess the effectiveness of a novel strategy to invite women for cervical cancer screening.

Study design: randomized controlled trial (pragmatic design, 12 centres, randomization of individuals).

Inclusion criteria:

- Women eligible for cervical cancer screening
- Age 25 to 49 years
- Registration at one of the participant primary care units (Figure 1.A and 1.B)
- Mobile phone number available at the National Health Database

Tested intervention: invitation based on automated and personalized text messages/phone calls and reminders (Figure 2).

Control: invitation through written letter (standard of care).

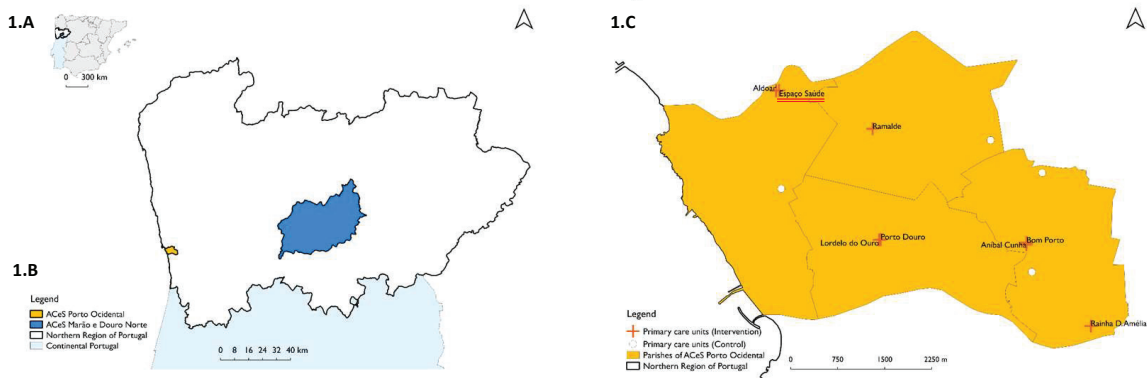


Figure 1 – Map of the participant health care areas and primary care units.

ACeS – Agrupamento de Centros de Saúde. The participant health care areas are depicted in Figure 1.A and 1.B. The enrolled primary care units of ACeS Porto Ocidental are represented in Figure 1.C. ACeS Porto Ocidental serves a urban area, while ACeS Marão e Douro Norte covers a sub-urban and rural territory.

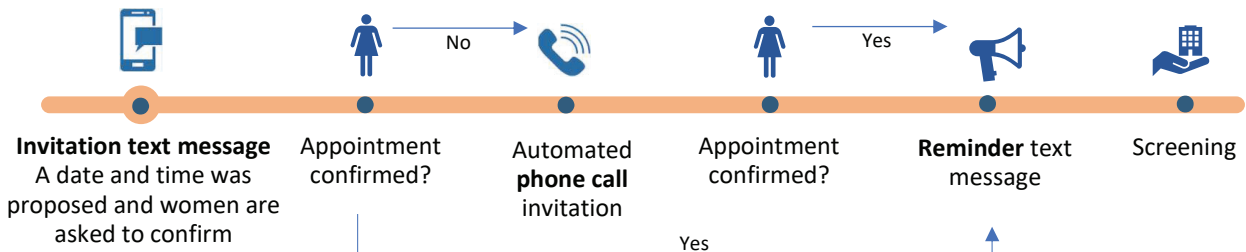


Figure 2 – Flowchart depicting the implementation of the intervention.

3 | Results of the trial

Overall effect of the intervention

On an intention-to-treat analysis, the adherence to cervical cancer screening was significantly higher among women assigned to intervention than to control group (39.0% vs. 25.7%, $p < 0.001$), corresponding to a difference of 13.3% (95% Confidence Interval [95% CI] 8.1 to 18.5), an Odds Ratio (OR) of 1.85 (95% CI 1.45 to 2.37) and a number needed to screen of 8.

Effect of the intervention by recruiting site and population subgroups

The superiority of the intervention was homogeneous across all the participant primary care units (Figure 3).

For USF Espaço Saúde the adherence was 22.2% in the intervention and 19.5% in the control groups, corresponding to a difference of 3.4% (95% CI -10.5 to 17.3) and an OR of 1.17 (95% CI 0.61 to 2.25).

The effectiveness of the intervention was higher among women aged 35-49 years, living in a more deprived area and among those who participated previously in organized screening (Figure 4).

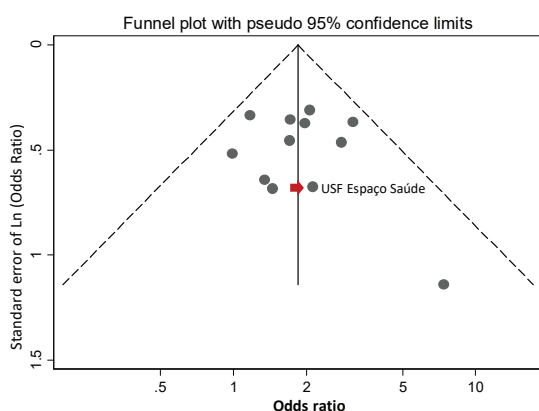


Figure 3 – Funnel plot* representing the odds ratios for the association between the intervention and adherence to cervical cancer screening, across the primary care units involved.

*Dots represent each of the participant primary care units (PCU). The vertical line depicts the overall effect. Results from each PCU are significantly different from the overall effect only when falling outside the triangle defined by the dashed lines.

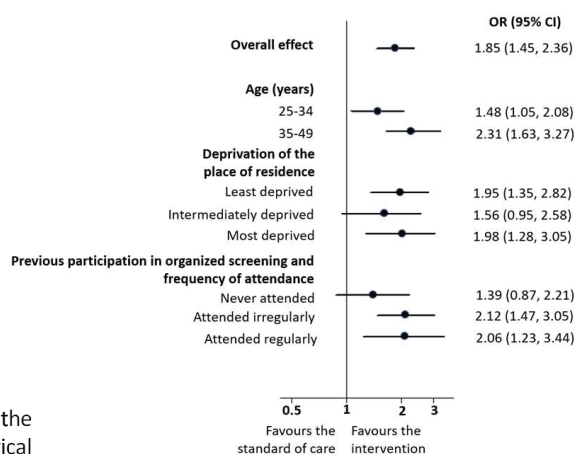


Figure 4 – Forest plot representing the effect of the intervention stratified by age group, deprivation and previous participation in organized screening.

4 | Internal and external validity

Internal validity: this investigation was based on a robust study design, and no major threats to the internal validity were identified.

External validity: this trial only included women aged 25 to 49 years, although cervical cancer screening is recommended till 65 years; therefore, the conclusions may not apply to older women, with expectedly more limited digital literacy. The proposed intervention was tested in health care units with characteristics similar to the primary health care settings that may be targeted by this intervention, and was tailored to the specificities of each center. The recruitment and follow-up procedures have replicated the standard practice in each center.

5 | Summary of main findings

A strategy based on automated and customized text messages, phone calls and reminders increased the adherence to cervical cancer screening in 13.3%, in relation to the standard of care (written letter). For USF Espaço Saúde, the proposed intervention increased the adherence in 3.4%. This invitation strategy is operator-independent, and therefore has the potential to be easily implemented on a regular basis.

6 | Funding and conflict of interest

This was an academic study supported by the institutions involved: *Instituto de Saúde Pública da Universidade do Porto*, *ACeS Porto Ocidental* and *ACeS Marão e Douro Norte*. The authors have no conflict of interest to declare.

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