CHOICE
BREAST CANCER LITERACY

Fighting breast cancer myths with understandable AI

Prof. Diego Costa Pinto · Coordinator, CHOICE · NOVA IMS

NOVA SCIENCE DAY



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Who we are

A European consortium for breast cancer literacy



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One project, three kinds of science

36 months

June 2025 to May 2028

4

partners in 3 countries

Portugal, Czechia, Greece; Italy recruiting

5M

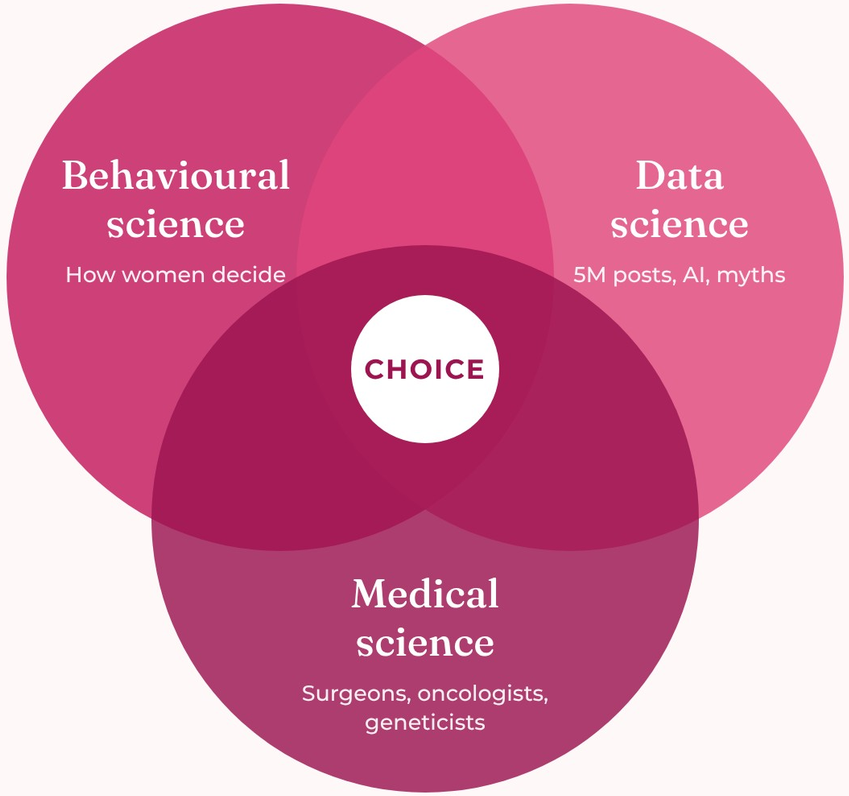
public posts read

with machine learning

407

women surveyed

carriers and women at risk



EU4Health Grant Agreement 101219225 · NOVA IMS coordinates

Source: Grant Agreement 101219225; IBA data export (2 November 2026); WP3 corpus.

One ribbon, four work packages

WP4 · TRANSLATE

Education and training

Masaryk University · Czechia

12 resources + 6 decision tools

WP2 · IDENTIFY NEEDS

Surveys and interviews

IBA · Czechia

300 surveys + 60 interviews



WP3 · BUILD EVIDENCE

Data-driven tools

NOVA IMS · Portugal

5M+ posts · 2,000+ term dictionary

WP5 · SCALE IMPACT

Outreach and engagement

AUTH · Greece

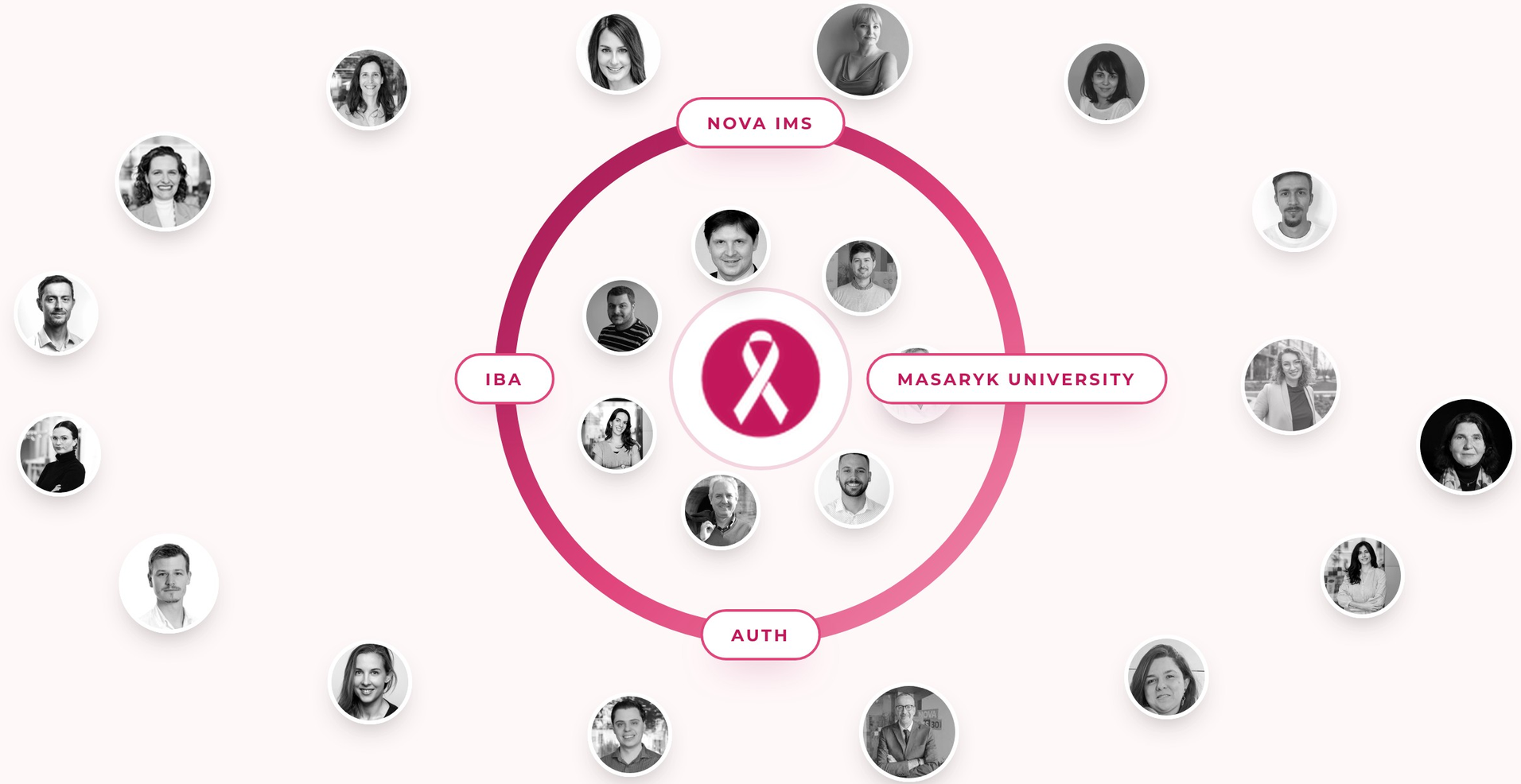
50+ organisations engaged

WP1 · Coordination and ethics · NOVA IMS holds the ribbon together

Targets are planned in the Description of Action, not reported achievements. Source: CHOICE Description of Action, Sections 2.2 and 4.2.

The CHOICE team

FOUR INSTITUTIONS, ONE CIRCLE



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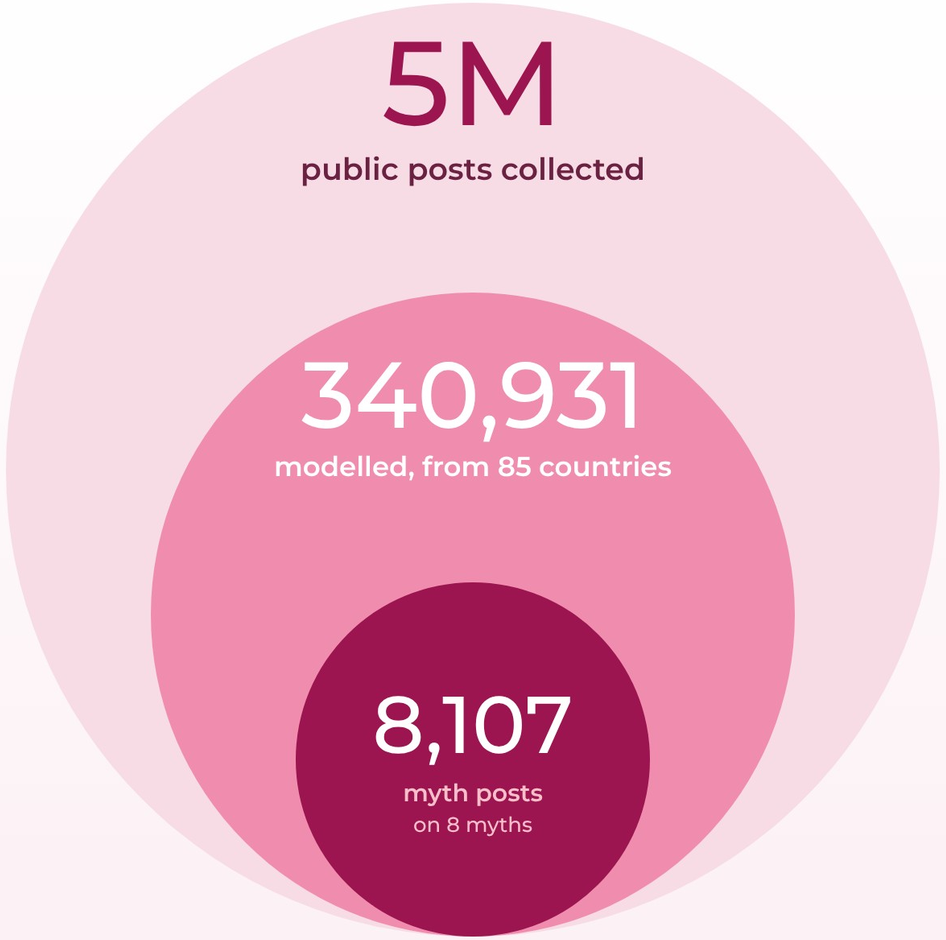
CHOICE in numbers

Our KPIs



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From 5 million posts to 8,107 myths





136%

of the survey target of 300

246 carriers and 161 women at risk

43

digital resources mapped

in 13 countries

4

countries, 6 sites

5 languages, 20 investigators

Source: IBA data export (2 November 2026); international and misinformation papers; D3.1 Mapping Report; WP5 Monitoring Tracker. Circles are illustrative, not to scale.

Midterm achievements



Top 50
Forbes Czechia Top 50 Doctors 2026
Dr. Miloš Holánek, CHOICE team, Masaryk University

12,000
Instagram views in three months
@breastcancer_choice, launched April 2026

136%
of the survey target
407 women surveyed against a target of 300

165
organisations engaged
3.3 times the target of 50

17
events and media moments
June 2025 to November 2026, in six countries and at EU level

Source: Newsletter #1 draft; AUTH, MU and IBA progress reports; WP5 Monitoring Tracker. Pink dots: events, sized by number. Rings: survey sites.

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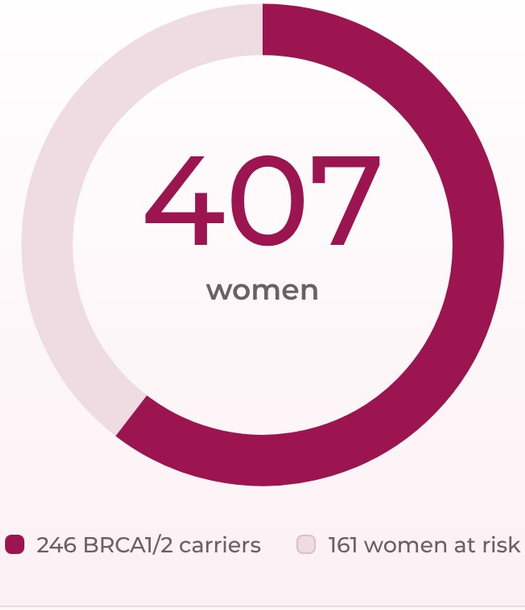
The multinational BRCA survey

What 407 women told us



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407 women, four countries, two groups



4

countries, 6 sites

Portugal, Czechia, Greece; Italy recruiting

5

languages

20 investigators collecting responses

TWO ARMS

Arm A: women who carry a BRCA1/2 variant, deciding about surgery and surveillance. Arm B: women at risk who have not yet been tested, deciding whether to test.

Source: CHOICE multinational survey, IBA data export 2 Nov 2026.

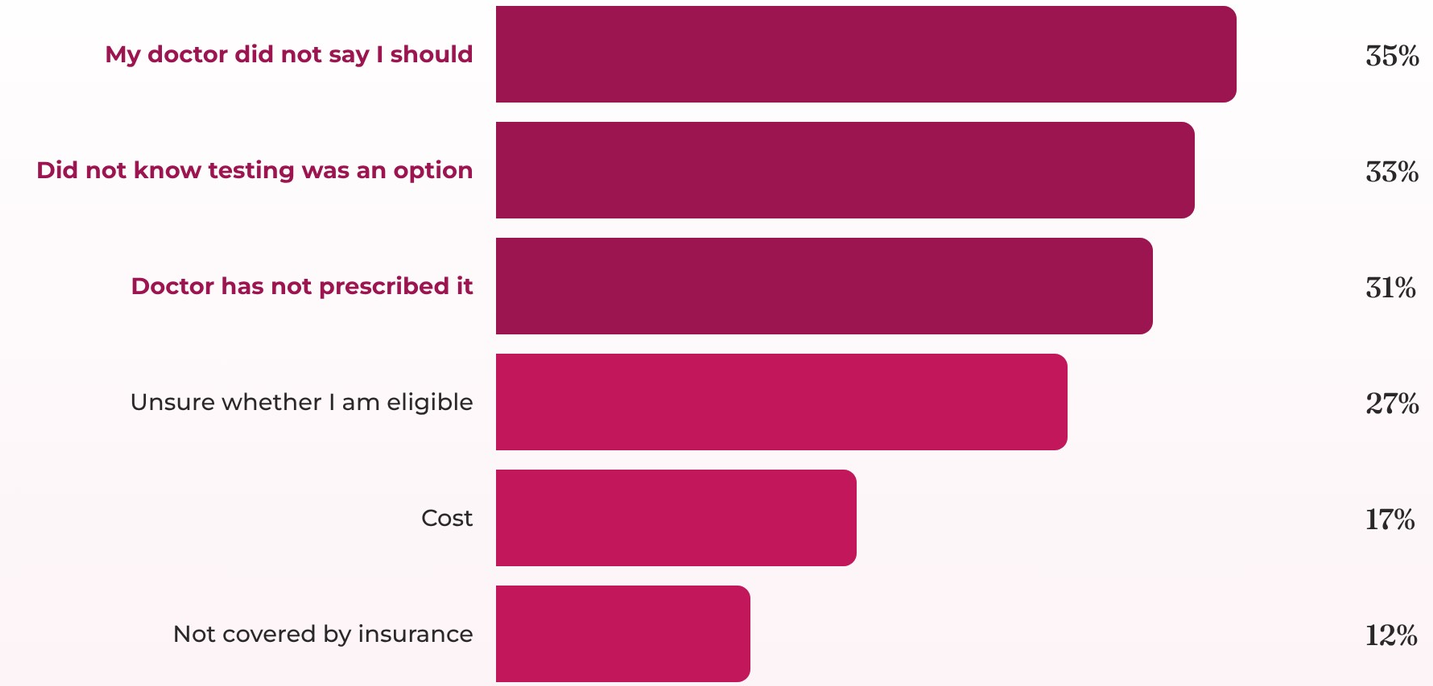
Six steps from awareness to an informed choice



Source: CHOICE survey (IBA export, 2 Nov 2026); D3.1 Mapping Report; misinformation paper.

Many women are never told

Why women at risk have not been tested, % (multiple answers)



35%

were never told by their doctor that they should test

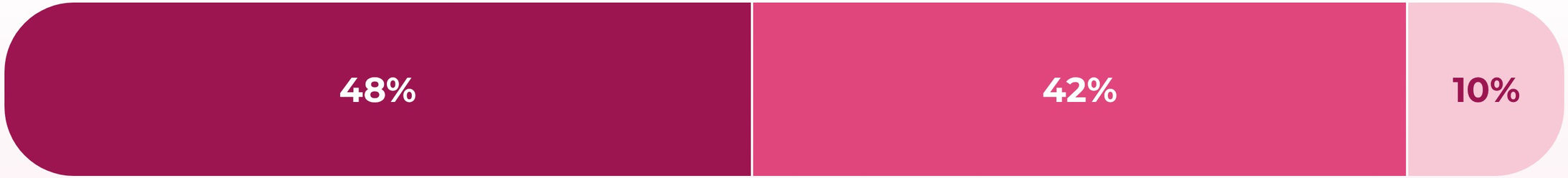
33%

did not know testing was an option

Source: CHOICE multinational survey, Arm B, women at risk not tested, Portugal and Greece (n = 147), IBA data export 2 Nov 2026.

Nine in ten hold back, but not out of fear

What untested women at risk say about testing, % (n = 147)



● 48% will not test ● 42% are hesitant ○ 10% prefer not to know

90%

hold back from testing

10%

say they prefer not to know. Fear is not the main barrier.

Source: CHOICE multinational survey, Arm B (n = 147), IBA data export 2 Nov 2026.

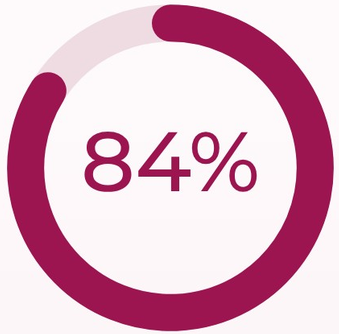
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Two doors that are hard to open

STEP 3 · ACCESS

21%

of carriers saw a plastic surgeon before deciding



Yet 84% of those who did say it shaped their decision.

STEP 4 · PERSONALISED INFORMATION

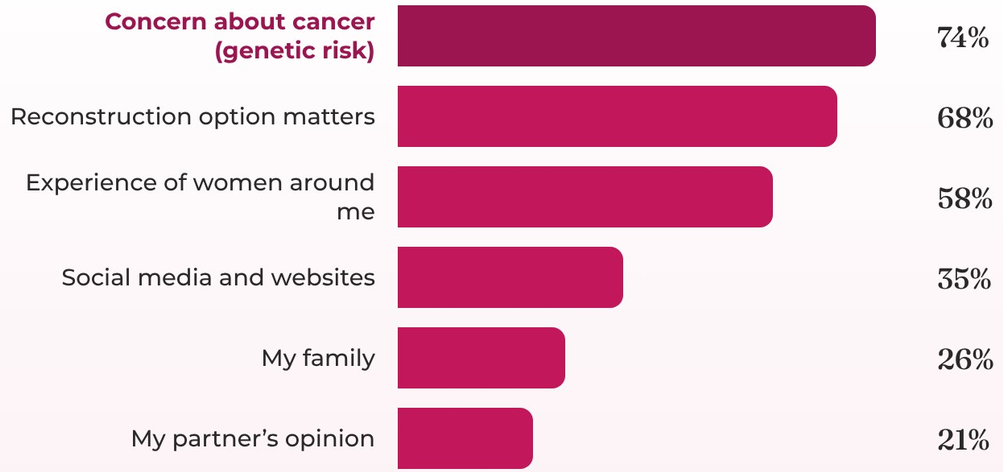
0 of 43

online resources let a woman explore her own risk

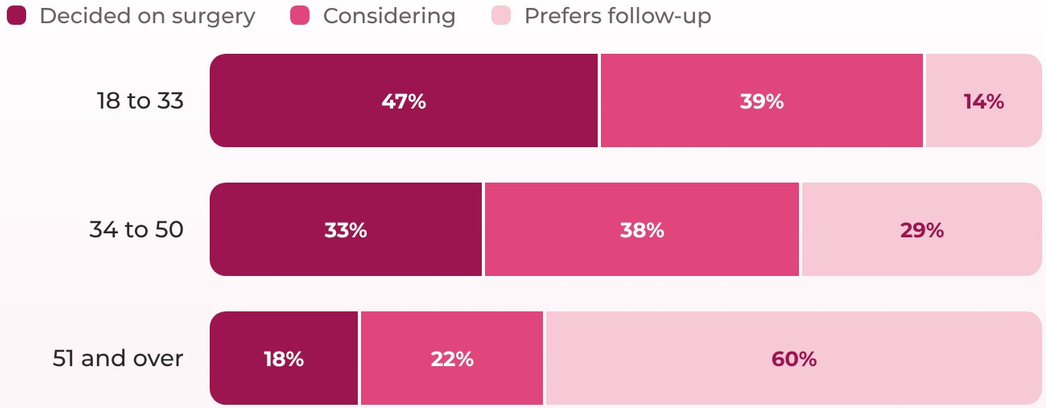
Source: CHOICE survey, Arm A (IBA export, 2 Nov 2026); D3.1 Mapping Report (43 resources, 13 countries).

Risk drives the decision, and age changes it

Agree the factor shapes their decision, % (n = 212)



Attitude to preventive mastectomy by age, Czech carriers (n = 175)



47% of carriers under 34 have decided on surgery, against 18% aged 51 and over, of whom 60% prefer follow-up.

Source: CHOICE multinational survey, Arm A, BRCA1/2 carriers, IBA data export, 2 November 2026. Five-point agreement scales; percentages are completely plus somewhat agree.

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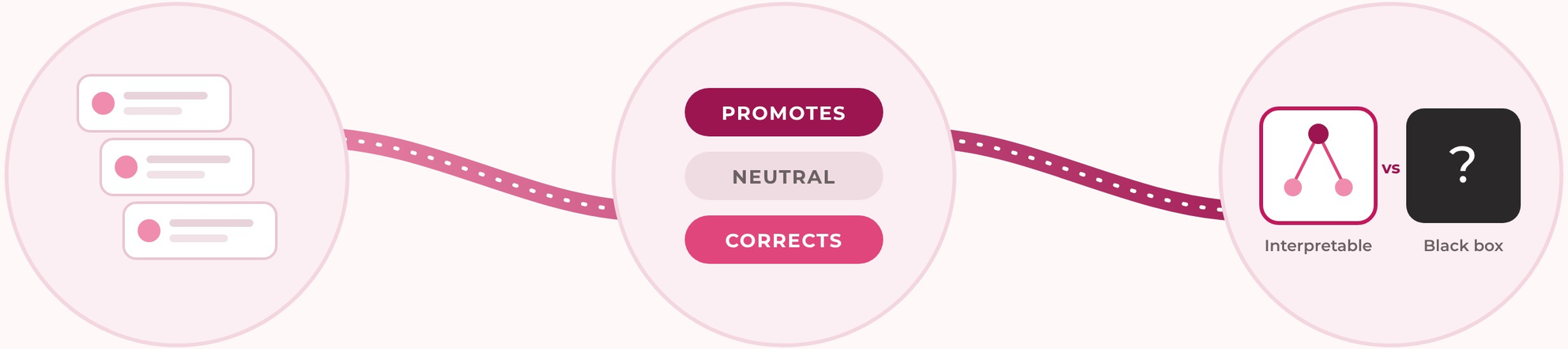
The BRCA myths study

Step 6: online, women meet myths. Can understandable AI fight them?



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How we tested it



1 · DATA

8,107

public posts on X about 8 breast cancer myths, January 2023 to August 2026

2 · LABELS

76%

agreement between the AI labels and a human researcher

3 · MODELS

Interpretable AI vs black box

same posts, same test, head to head

Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR). Every post was scored by a model that had never seen it.

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The same myth, three voices

Myth: “Antiperspirants or deodorants cause breast cancer”. Real public posts on X.

PROMOTES THE MYTH

This is one the reasons no one will tell you why breast cancer happens. Aluminum in deodorant. Also, wires in bras.

NEUTRAL

i thought aluminium in anti-perspirant sticks was linked with an increased risk of breast cancer?

CORRECTS IT

Cancer surgeon here. Aluminum deodorant does not cause breast cancer. No deodorant or antiperspirant causes breast cancer. Summer is coming, y'all PLEASE use the stuff.

The problem. Thousands of posts like these, on eight myths. Health institutions need AI to find them, and to explain why a post was flagged.

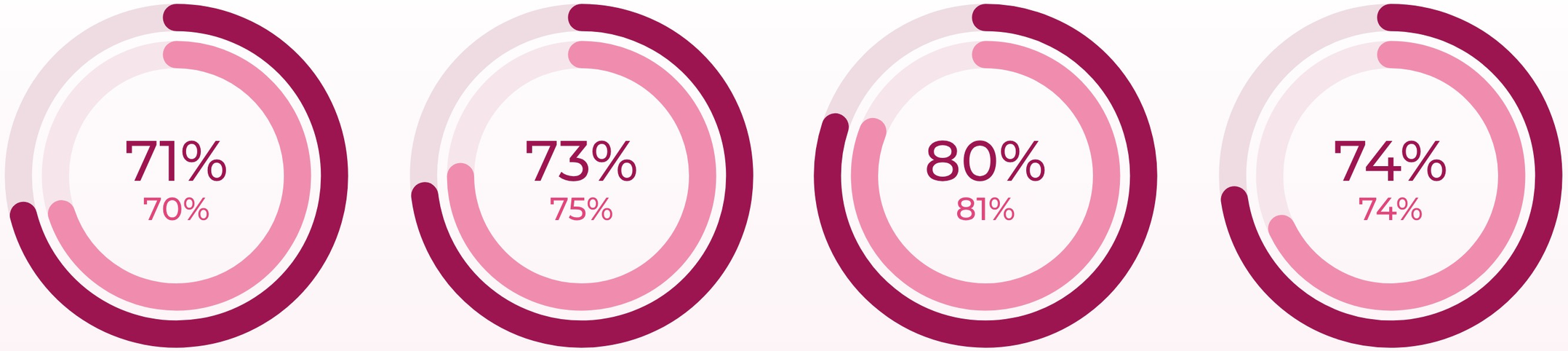
Posts lightly shortened, @mentions removed; wording and spelling otherwise kept. Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR).

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Transparent AI matches the black box

Transparent AI (outer ring) · Best black box (inner ring)

Share of posts classified correctly, on posts the AI had never seen



Spot myths from understandable signals
transparent 1 point ahead

Spot myths from the full text
black box 2 points ahead

Predict which posts reach a large audience
black box 1 point ahead

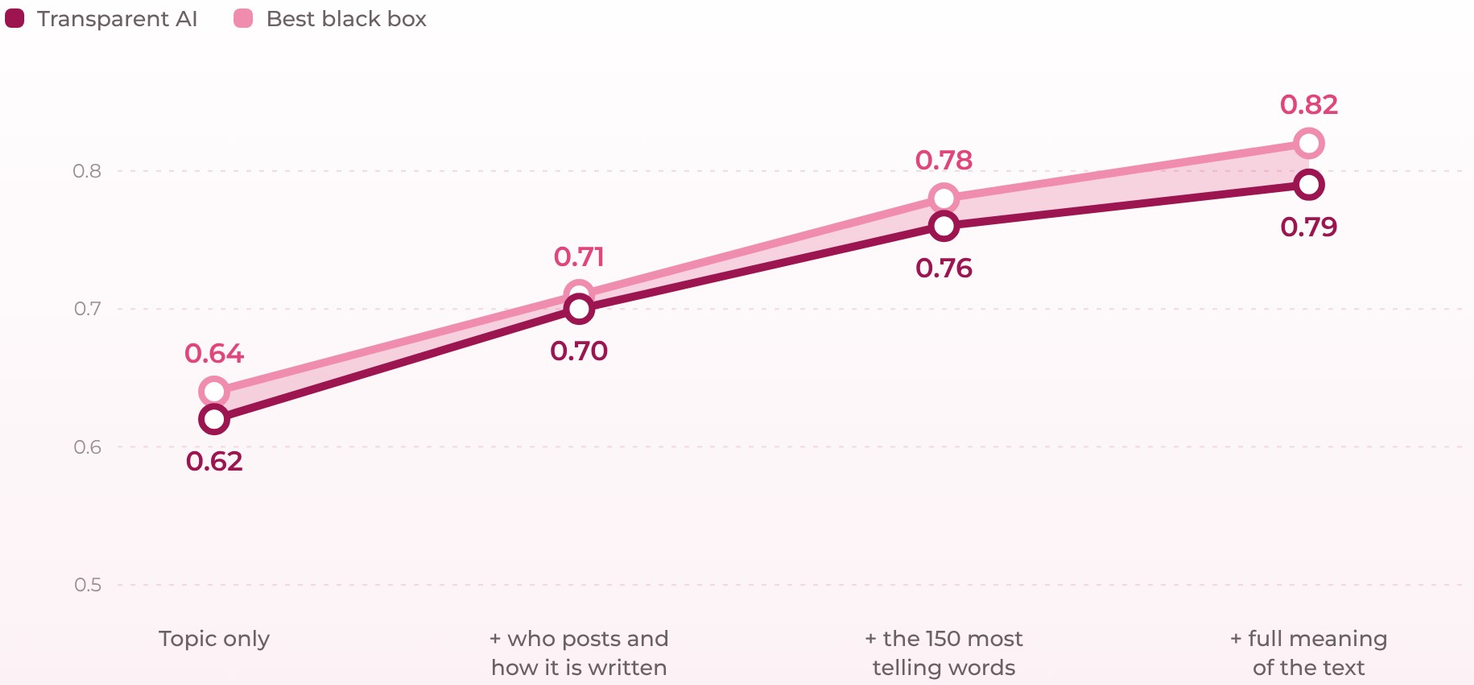
Predict sharing per follower
tied

Accuracy can fool: only 18% of posts spread widely, so “nothing will spread” is already 82% accurate. We therefore also tested with ROC AUC (next slide).

Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR). 8,107 posts on X; nested cross-validation.

More information, better detection

Spotting myths: ROC AUC as we give the AI more information about each post



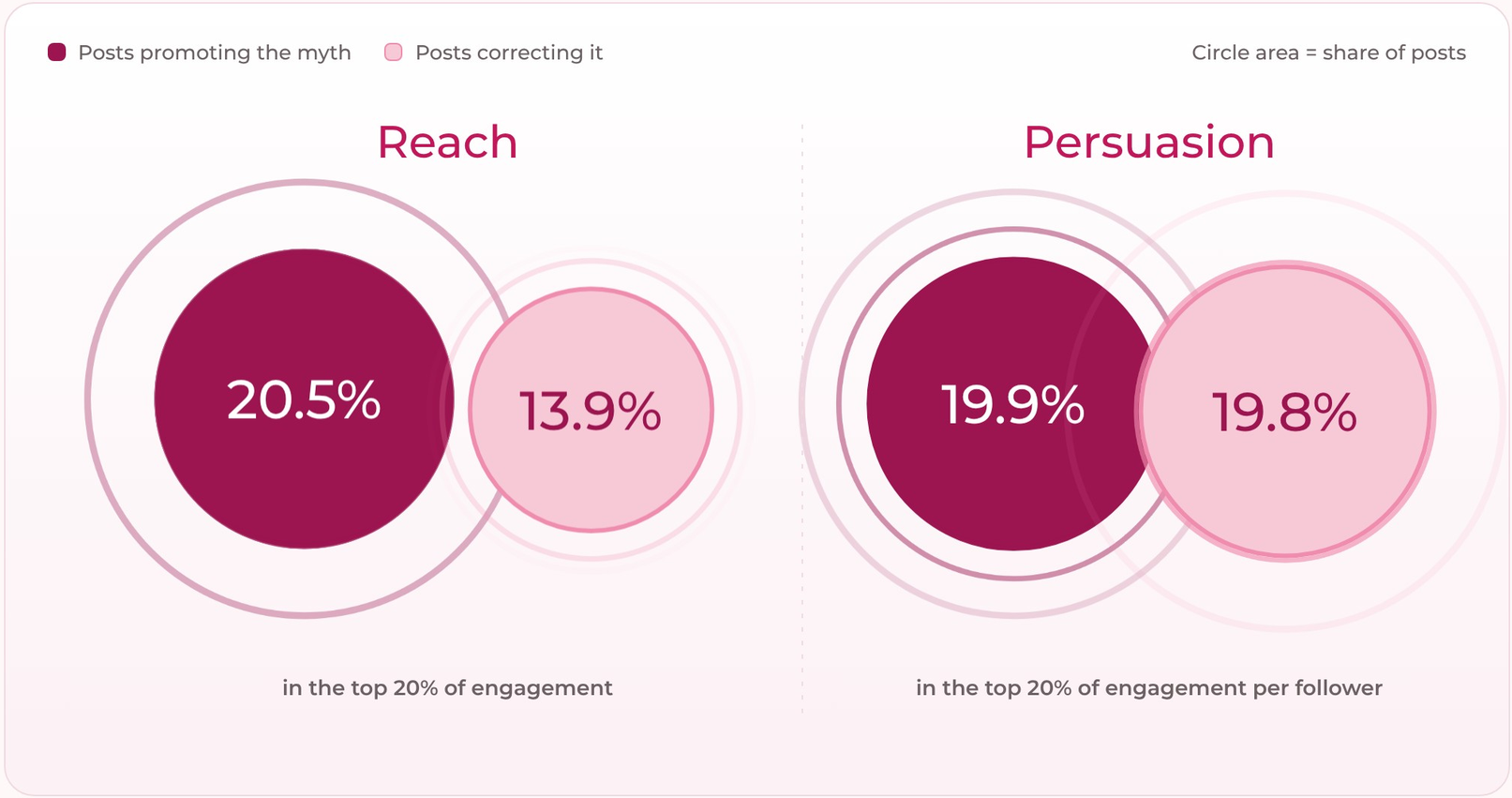
0.62

topic alone barely helps

Knowing a post is about deodorants does not say whether it believes the myth. Who posts, and how, matters more.

Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR). Best black box at each step: LightGBM, gradient boosting, random forest, extra trees. Axis starts at 0.5 (chance).

Myths travel further, but persuade no better



1.5×

myths reach a large audience 1.5 times as often as corrections

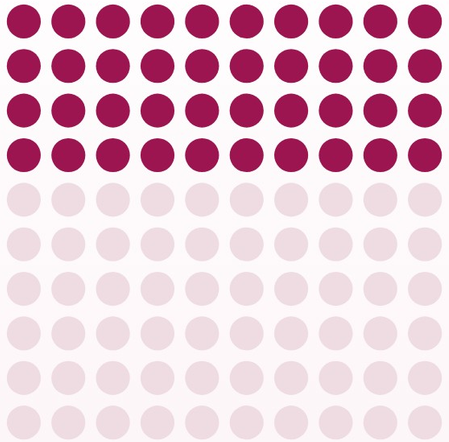
Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR). Matched on myth, author follower quintile and year. 20.5 / 13.9 = 1.47. Ripples are illustrative.

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Which posts should a team check first?

A team can only check the posts each method ranks highest (its top 10%). Out of every 100 posts they check, how many are myths that went viral?

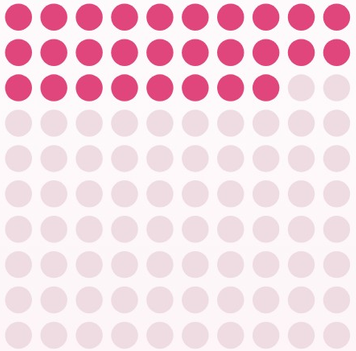
● a viral myth, caught ● a post that was not a viral myth



40 of 100

CHOICE triage

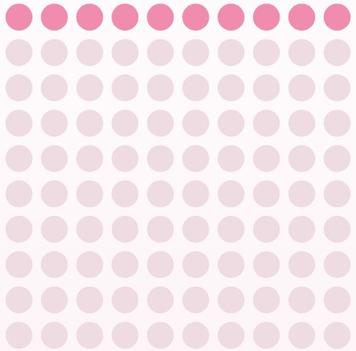
ranks by “is it a myth?” and “will it spread?”, and shows why



28 of 100

Biggest accounts first

check the most-followed authors



10 of 100

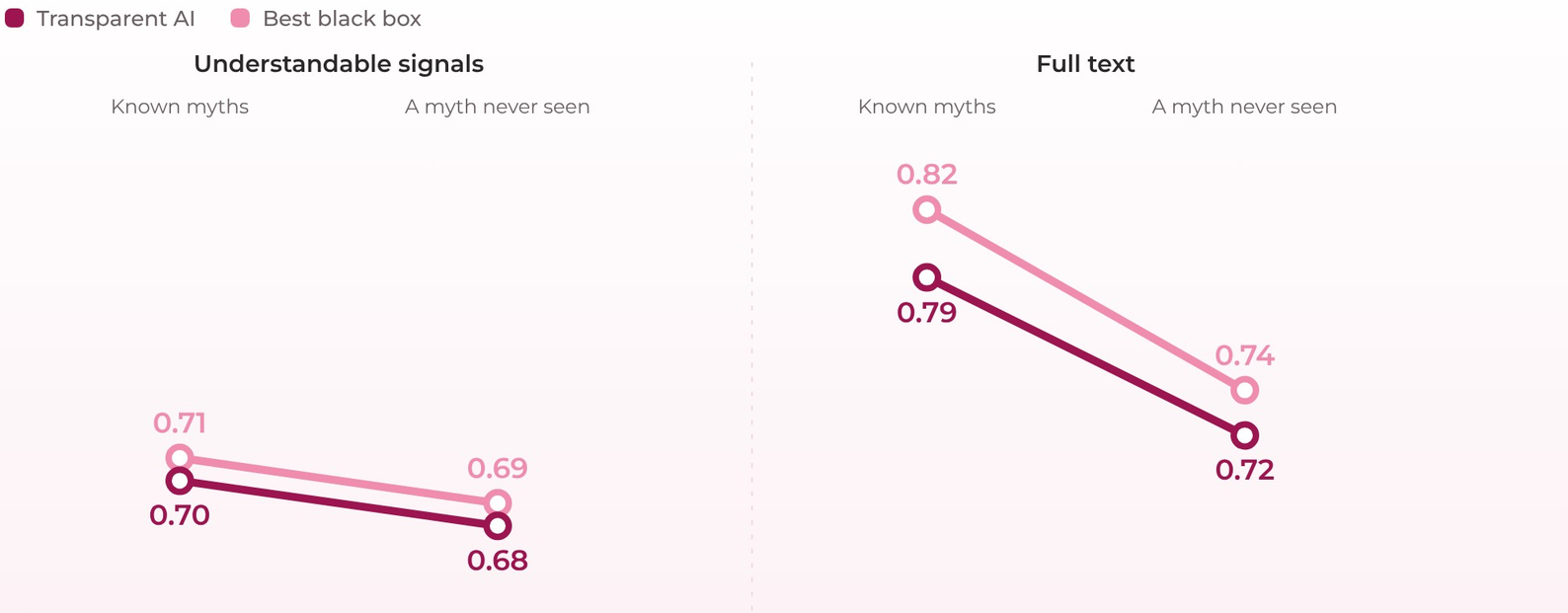
Random order

check posts as they come

Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR). Share of widely-seen misinformation among the top 10% of posts ranked by each method. Black-box tool: 44 of 100. Checking the top 20%, the CHOICE triage finds 50% of all such posts.

A myth the AI has never seen

Spotting myths: ROC AUC on known myths vs. a myth the AI was never trained on



All drop

every AI is less accurate on a myth it has never seen, transparent or not

0.80 vs 0.74

stability of the top-5 reasons: transparent AI vs. explanations added to the black box

Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR). New myth = trained on seven myths, tested on the eighth, averaged over eight. Axis from 0.66.

The CHOICE algorithm: a cycle that keeps going

1

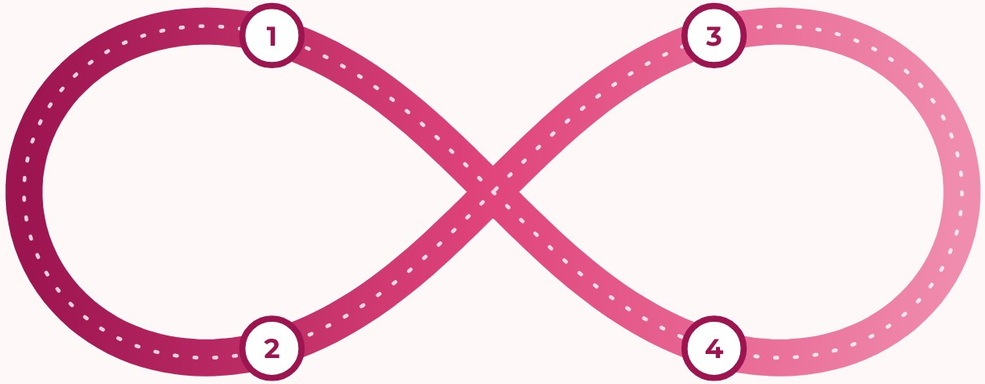
CHOICE understands the signals

It reads topic, author and wording, and shows the effect of each as one simple chart.

2

CHOICE knows the why

Every automatic flag comes with its reason, and the reasons are stable across data samples.



EVERY NEW MYTH KEEPS THE CYCLE GOING

3

CHOICE prioritises

It ranks posts by “is it a myth?” and “will it spread?”, so a team checks the right ones first.

4

CHOICE keeps learning

A new myth appears, a few examples are labelled, the model is upgraded, and the cycle goes on.

Source: Pereira, Vanneschi and Costa Pinto, Transparent infoveillance of breast cancer misinformation (submitted to JMIR).

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Thank you

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