A Decade of Evolution: Lessons Learned and Long-term Outcomes of Latvia's Screening Program

IACCS
International Asian Cancer and Chronic Disease Screening Network

Mārcis Leja

Taipei, June 5, 2026

UNIVERSITY OF LATVIA
INSTITUTE OF CLINICAL AND PREVENTIVE MEDICINE

EU CanScreen
European Joint Action on Cancer Screening

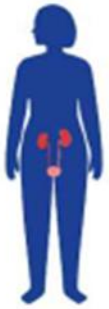

LATVIA

How Latvia compares to Taiwan?

Category	Latvia	Taiwan
Territory	64,600 km^2 (1.7 compared to Taiwan)	~36,000 km^2
Population	~1.8–1.9 million	~23.2 million
Population density	~76 people/km^2	~1660 people/km^2
Median age	~44 years	~45 years
Life expectancy	~76.6 years	~81.1 years
GDP per capita	~$23,000	~$34,000
Gastric cancer incidence (ASR)	12.1	~8–10
Colorectal cancer incidence (ASR)	23.5	~35–45

European Council Recommendation, 2022

BREAST CANCER suggesting a lower age limit of 45 and a higher age limit of 74 (standard 50 – 69), plus MRI scans when medically appropriate



HPV testing for women aged 30 to 65, every 5 years or more, to detect CERVICAL CANCER, taking account of HPV vaccination status

Triage testing for COLORECTAL CANCER in people aged 50 – 74 through faecal immunochemical testing (FIT) to determine follow-up via endoscopy/colonoscopy

LUNG CANCER testing for individuals at high risk (i.e. smokers), incl. prevention approaches

Prostate specific antigen testing for PROSTATE CANCER in men, plus MRI scans for follow-up

In places with high GASTRIC CANCER incidence and death rates, screening for Helicobacter pylori and surveillance of precancerous stomach lesions

Gastric cancer

Screening for *Helicobacter pylori* should be considered in those countries or regions inside countries with high gastric cancer incidence and death rates, according to thresholds to be defined in European guidelines with quality assurance.

Screening should also address strategies for identification and surveillance of patients with **precancerous stomach lesions** unrelated to *Helicobacter pylori* infections. Considering the evidence for screening and the need for a stepwise approach, countries should begin to test the feasibility of this programme, including by using implementation studies.

European Council Recommendation, 2022

Ongoing activities in Europe

- GISTAR
- EUROHELICAN
- TOGAS & TOGAS Plus
- EUCanScreen Joint Action
- European Code Against Cancer
- EC-GaC (guideline development)

EUROHELICAN
Accelerating gastric cancer reduction in Europe through *Helicobacter pylori* eradication

TOGAS
TOWARDS GASTRIC CANCER SCREENING IMPLEMENTATION IN THE EUROPEAN UNION

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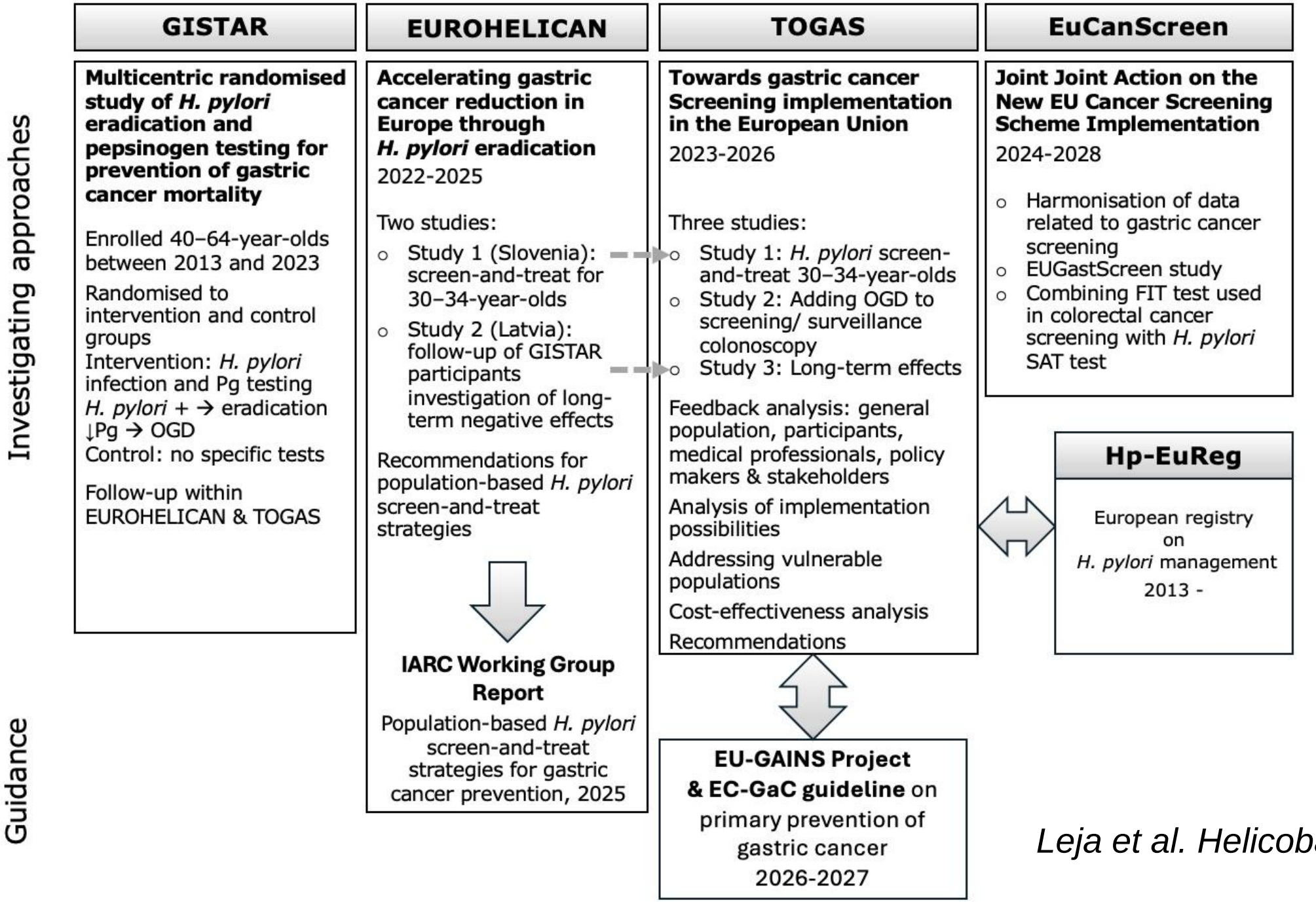

Leja et al. Helicobacter. 2026

Open Access Protocol

BMJ Open

Multicentric randomised study of *Helicobacter pylori* eradication and pepsinogen testing for prevention of gastric cancer mortality: the GISTAR study

Marcis Leja,[1,2,3] Jin Young Park,[4] Raul Murillo,[4] Inta Liepniece-Karele,[1,2,5] Sergejs Isajevs,[1,2,5] Ilze Kikuste,[1,3] Dace Rudzite,[1,2] Petra Krike,[1] Sergei Parshutin,[1,6] Inese Polaka,[1,6] Arnis Kirsners,[1,6] Daiga Santare,[1,2] Valdis Folkmanis,[1] Ilva Daugule,[1] Martyn Plummer,[7] Rolando Herrero[4]

BMJ Open. 2017

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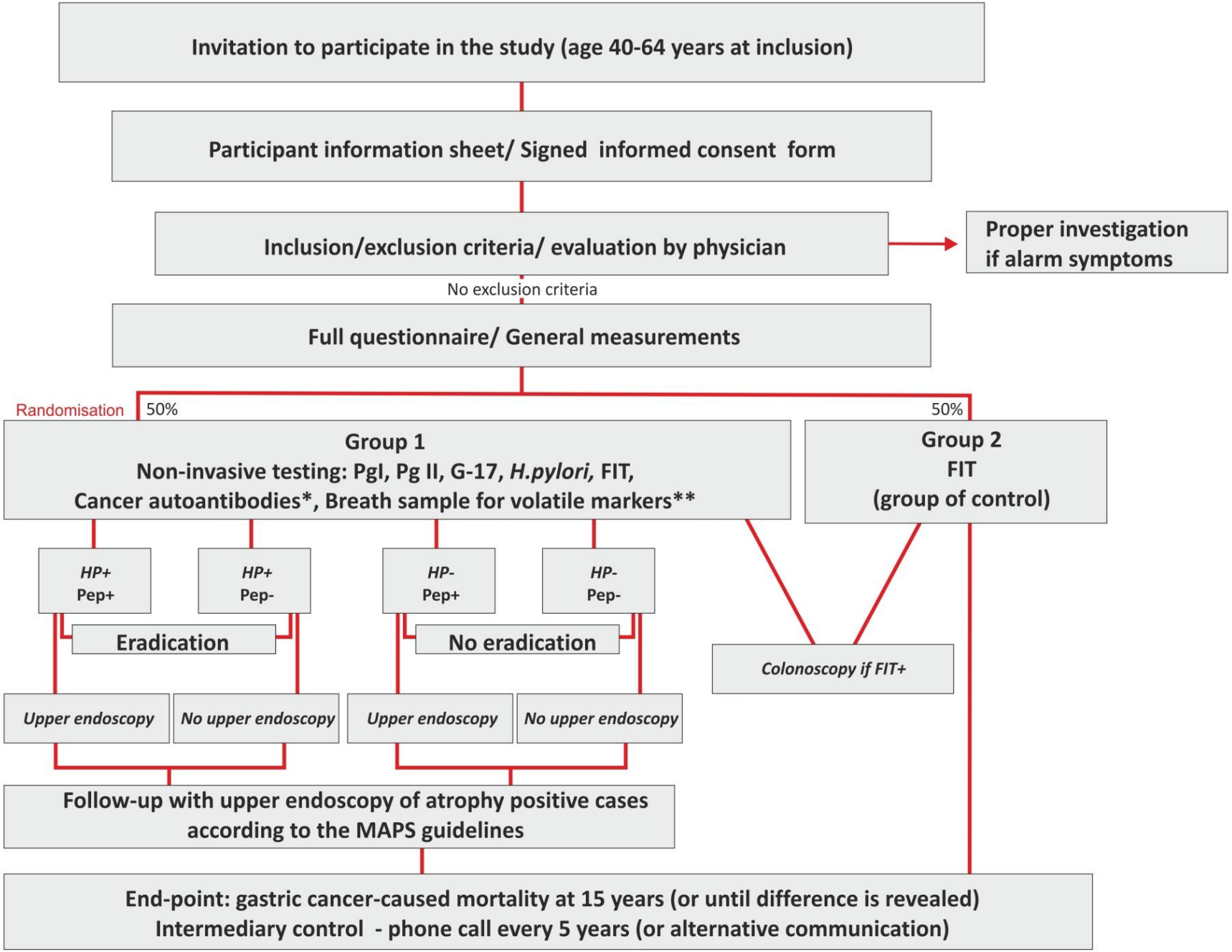
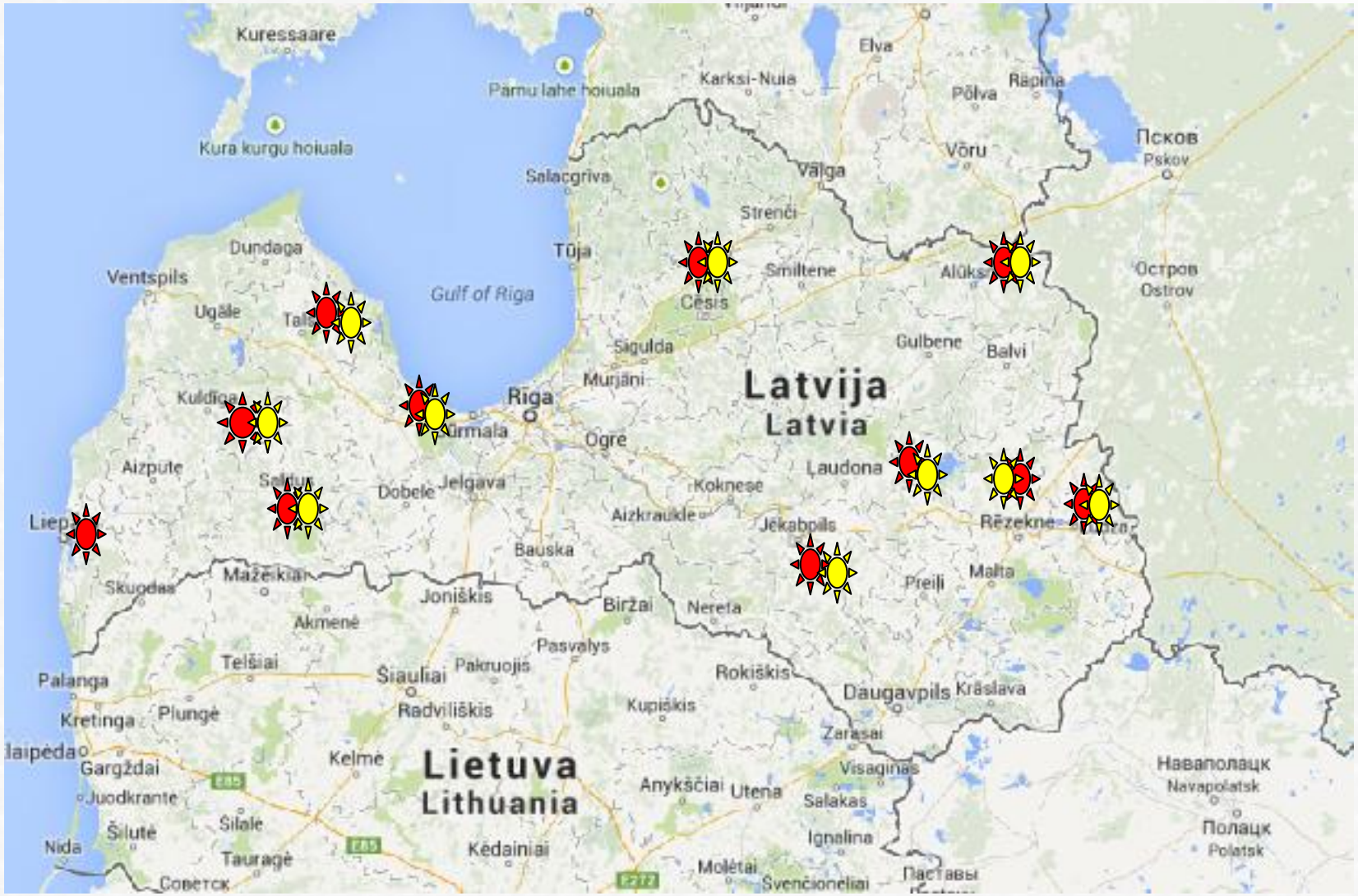
International Agency for Research on Cancer

World Health Organization


Invitation to participate in the study (age 40-64 years at inclusion)
Participant information sheet/ Signed informed consent form
Inclusion/exclusion criteria/ evaluation by physician
Proper investigation if alarm symptoms
No exclusion criteria
Full questionnaire/ General measurements
Randomisation
50%
50%
Group 1
Non-invasive testing: PgI, Pg II, G-17, H.pylori, FIT,
Cancer autoantibodies*, Breath sample for volatile markers**
Group 2
FIT
(group of control)
HP+ Pep+
HP+ Pep-
HP- Pep+
HP- Pep-
Eradication
No eradication
Colonoscopy if FIT+
Upper endoscopy
No upper endoscopy
Upper endoscopy
No upper endoscopy
Follow-up with upper endoscopy of atrophy positive cases according to the MAPS guidelines
End-point: gastric cancer-caused mortality at 15 years (or until difference is revealed)
Intermediary control - phone call every 5 years (or alternative communication)

Recruitment sites in Latvia



GISTAR IN FIGURES

- Recruitmement 2013 – 2023
- Direct follow-up 2023 - 2026
- 11,223 study participants enrolled
- 10,882 study participants randomised
- (pilot study – 3447, main study – 7435)
- *H.pylori* positivity at baseline (UBT) – 51.0%
- Eradication Rx given to 2599
- Low pepsinogen values – 7.65%
- FIT positivity - 6.2%

Riga, March 2012

ANALYSIS PERFORMED SO FAR

Factors influencing participation in preventive interventions for gastric cancer: the results from the GISTAR study

Mārcis Leja[a,b,c], Eva Cine[a], Inese Poļaka[a,d], Ilva Daugule[a], Raul Murillo[e,f], Sergei Parshutin[a,d], Danute Ražuka-Ebela[a], Laura Rotberga[a], Linda Anarkulova[a], Petra Kriķe[a], Daiga Šantare[a,b], Lilian Tzivian[a], Rolando Herrero[e,g] and Jin Young Park[e]

European Journal of Cancer Prevention 2021

diagnostics 2022 MDPI

Article

Assessment of Serum Pepsinogens with and without Co-Testing with Gastrin-17 in Gastric Cancer Risk Assessment—Results from the GISTAR Pilot Study

Claudia Robles [1,2,*], Dace Rudzite [3,4], Inese Polaka [3], Olga Sjomina [3], Lilian Tzivian [3], Ilze Kikuste [3,5], Ivars Tolmanis [5], Aigars Vanags [5], Sergejs Isajevs [3,4,6], Inta Liepniece-Karele [3,4,6], Danute Razuka-Ebela [3], Sergej Parshutin [3], Raul Murillo [1,7], Rolando Herrero [1,8], Jin Young Park [1] and Marcis Leja [3,4,5]

Randomised clinical trial: efficacy and safety of *H. pylori* eradication treatment with and without *Saccharomyces boulardii* supplementation

Olga Sjomina[a,b], Inese Poļaka[a], Jekaterina Suhorukova[a], Reinis Vangravs[a], Sergejs Paršutins[a], Viktoria Knaze[c], Jin Young Park[c], Rolando Herrero[c,d], Raul Murillo[e] and Mārcis Leja[a,b]

2024

European Journal of Cancer Prevention

Clarithromycin-containing triple therapy for *Helicobacter pylori* eradication is inducing increased long-term resistant bacteria communities in the gut

Gut 2023

diagnostics 2022 MDPI

Article

Who Could Be Blamed in the Case of Discrepant Histology and Serology Results for *Helicobacter pylori* Detection?

Sabine Skrebinska [1,2,*], Francis Megraud [3,4], Ilva Daugule [1], Daiga Santare [1,5], Sergejs Isajevs [1,6], Inta Liepniece-Karele [1,6], Inga Bogdanova [1,6], Dace Rudzite [1,5], Reinis Vangravs [1], Ilze Kikuste [1,7], Aigars Vanags [1,7], Ivars Tolmanis [7], Selga Savcenko [1,5], Chloé Alix [3,4], Rolando Herrero [8,9], Jin Young Park [9] and Marcis Leja [1,7]

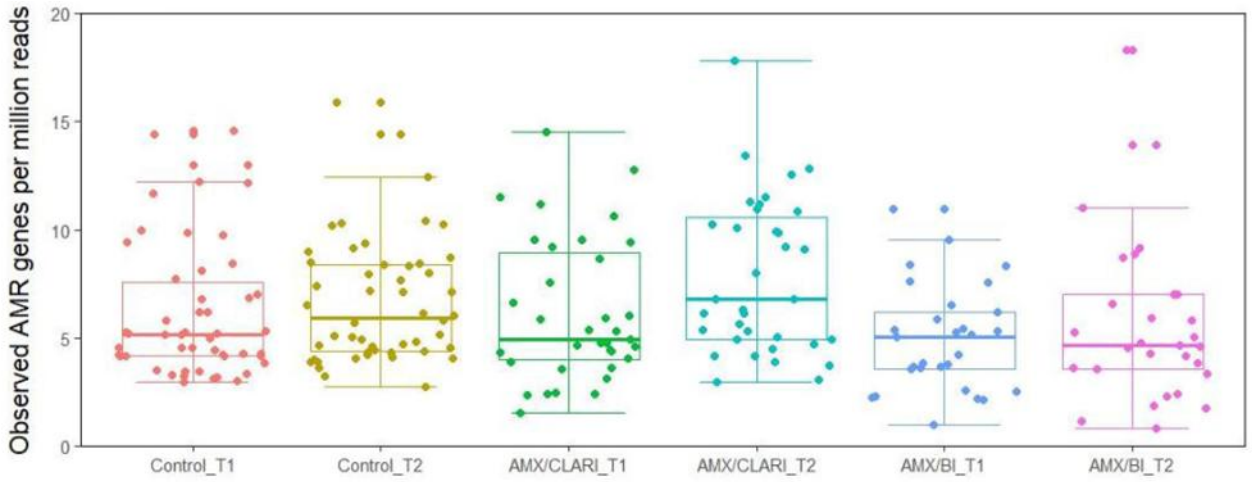
Randomised clinical trial: comparison of efficacy and adverse effects of a standard triple clarithromycin-containing regimen with high-dose amoxicillin and bismuth therapy in *Helicobacter pylori* eradication

Olga Sjomina[a,b], Alise Lielause[a,b], Aiga Rūdule[a], Reinis Vangravs[a], Sergejs Paršutins[a], Inese Poļaka[a], Ilva Daugule[a,b], Ilmārs Stonāns[a], Jin Young Park[c] and Mārcis Leja[a,b]

European Journal of Cancer Prevention 2022, **31**:333–338

GUT RESISTOME 6 MONTHS FOLLOWING ERADICATION

- **Gut resistome remained increased for at least 6 months after the 14- day clarithromycin- containing regimen**
- **but not in the amoxicillin/bismuth-containing treatment and control groups**



Sjomina O et al. Gut. 2024

BASELINE

GISTAR
Intervention group

Tested for *H. pylori* and pepsinogen +/- OGD

GISTAR
Control group

Regular healthcare in LV

FOLLOW-UP

1. Participant invited for follow-up by phone call
2. Repeat informed consent form
3. Blood samples drawn, processed, frozen and stored
4. ^{13}C-UBT for *H. pylori*
   if HP-positive at baseline
5. Questionnaire conducted by study personnel
6. FIT test issued
7. Anthropometric measurements

H. pylori positives are recommended eradication

Paired sample analysis follow-up vs. baseline

Total cholesterol, triglycerides, LDL-H, HDL-H, glycated albumin, glucose, insulin, ferritin, homocysteine, vitamin B12, folic acid, CRP and high sensitivity CRP

Follow-up vs. baseline:

BMI, major health events incl. cardiovascular, metabolic and gastrointestinal, GERD symptoms (GERDQ).

Follow-up vs. baseline:

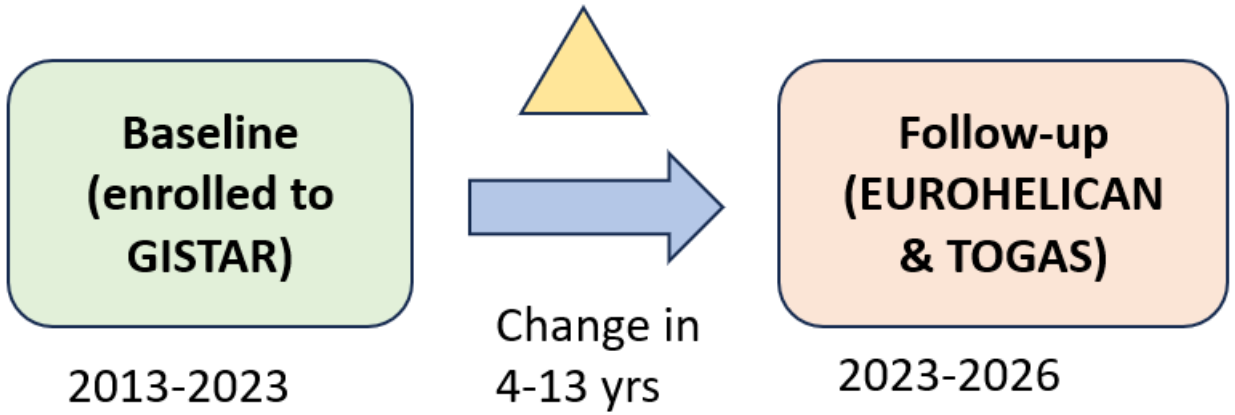
Weight, BMI, waist-hip ratio, blood pressure

DIRECT FOLLOW-UP

4-13 years following the recruitment

Reached out – 9053

Re-visited the study centre 5035



Parametres:

- Weight
- BMI
- WHR
- GERDQ score
- Blood parameters

Incidence of:

- GERD
- Type 2 diabetes
- Serious health events
  - Heart attack
  - Stroke

DYNAMICS OF CLINICAL CHEMISTRY PARAMETRES

GISTAR baseline samples
plasma samples stored at -70℃
between 2013 and 2020 (5-12 years)

Follow-up samples (EUROHELICAN & TOGAS)
plasma samples stored at -70℃
between 2023 and 2024 (1-2 years)

Baseline

2013-2023

Dynamics in 4-13 yrs

Follow-up

2024-2026

paired sample analysis

- High sensitivity C-reactive protein
- C-reactive protein
- Ferritin
- Folic acid
- Vitamin B12
- Glycated albumin
- Insulin
- Glucose
- Total cholesterol, HDL-H, LDL-H, Triglycerides
- Homocysteine

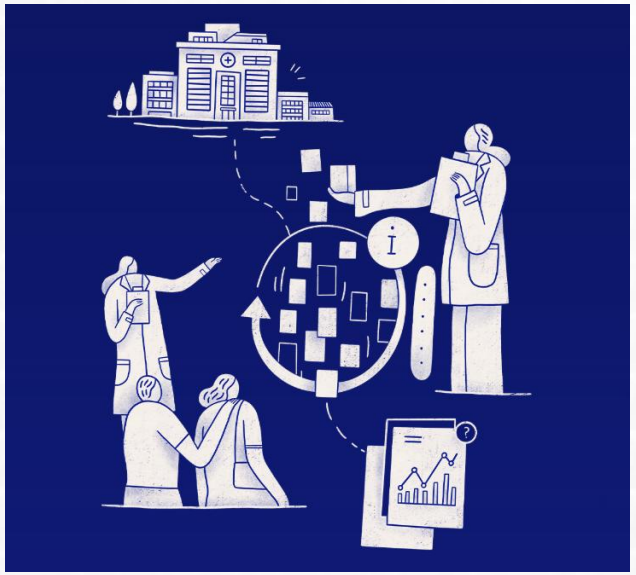
Cancer registry-based outcomes (GISTAR cohort)

Cancer cases diagnosed following the recruitment
(2-5 years following the recruitment)

Gastric cancers – 36 (9)

Colorectal cancers – 55 (17)

Other cancers – 599 (219)



TOGAS

TOWARDS GASTRIC CANCER SCREENING
IMPLEMENTATION IN THE EUROPEAN UNION

EU4Health Programme (EU4H)

TOWARDS GASTRIC CANCER SCREENING IMPLEMENTATION IN THE EUROPEAN UNION

TOGAS

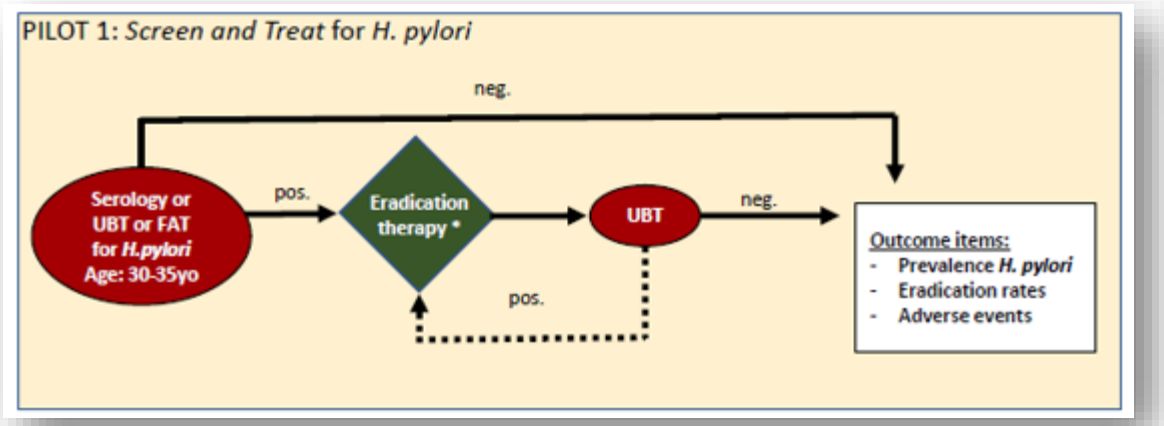
TOWARDS GASTRIC CANCER SCREENING
IMPLEMENTATION IN THE EUROPEAN UNION

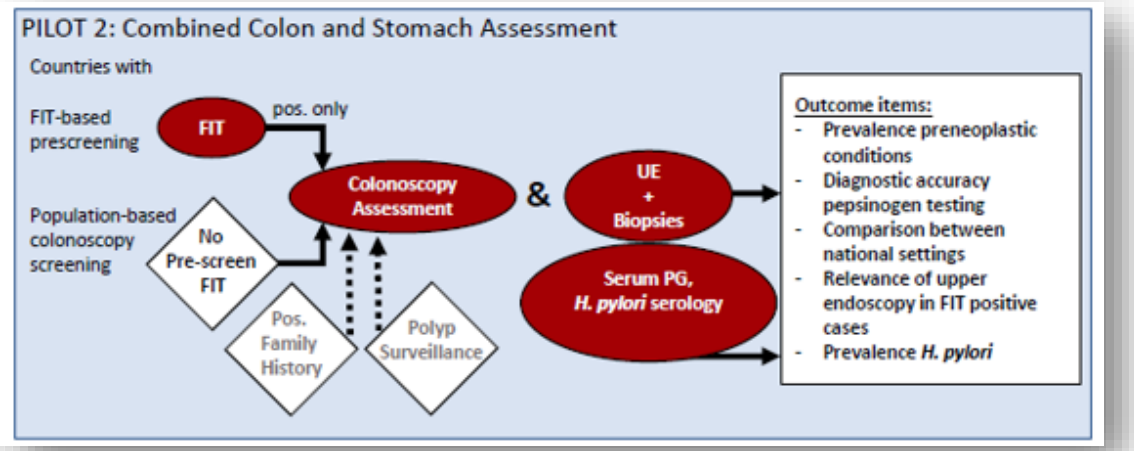
Co-funded by the European Union

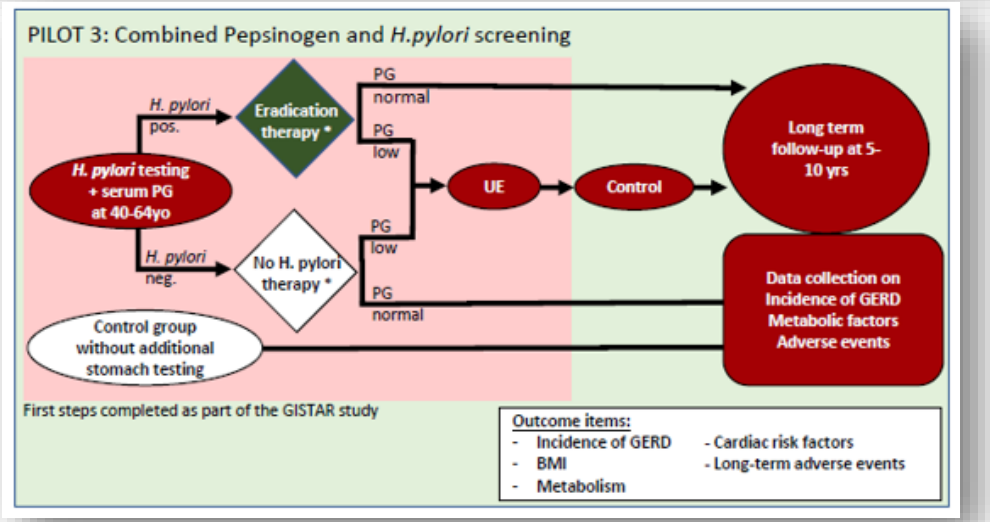
TOGAS partner countries

Created with mapchart.net

TOGAS pilot studies







TOGAS
TOWARDS GASTRIC CANCER SCREENING IMPLEMENTATION IN THE EUROPEAN UNION

Co-funded by the European Union

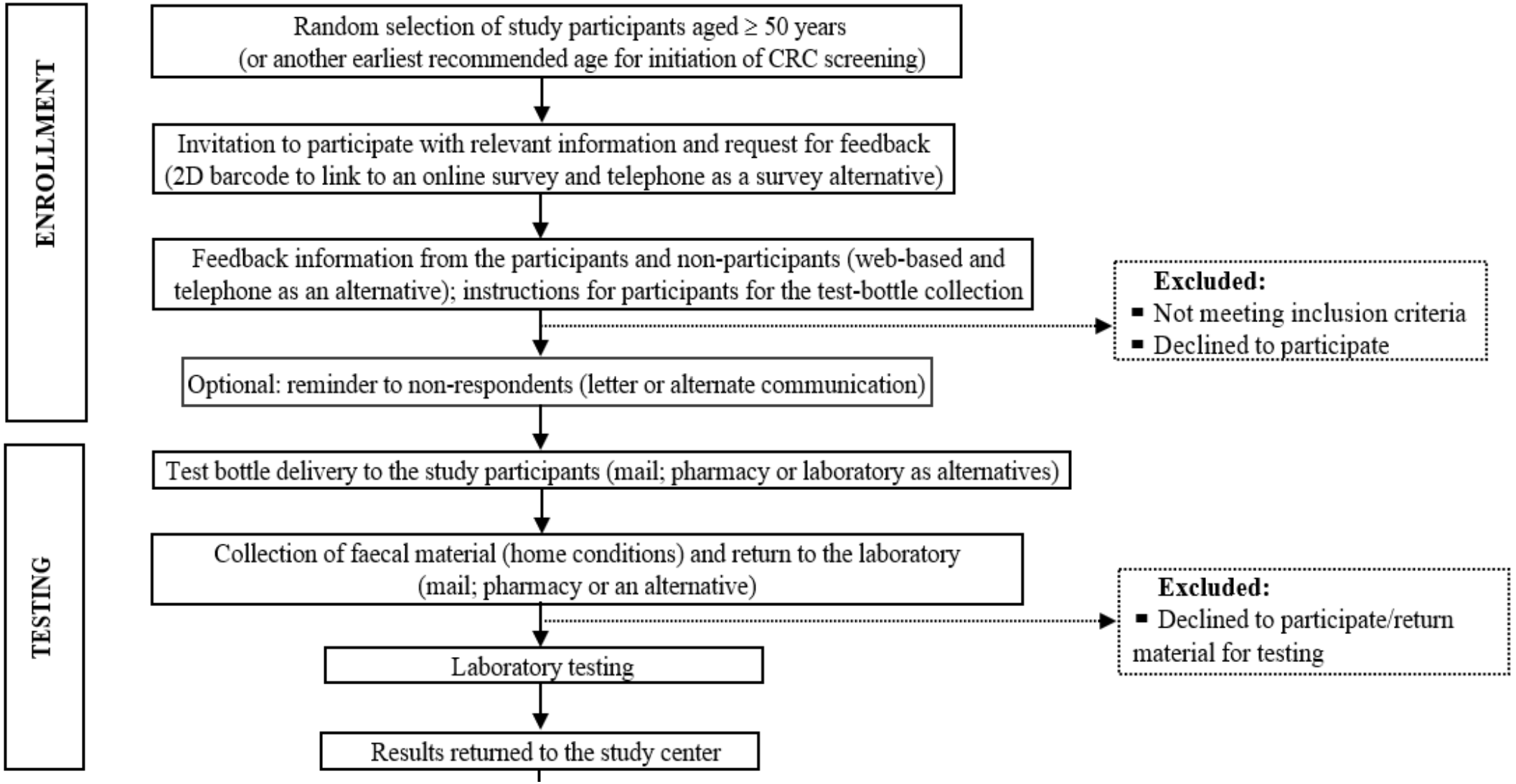
EU CanScreen
European Joint Action on Cancer Screening

H.pylori antigen in combination to FIT screening

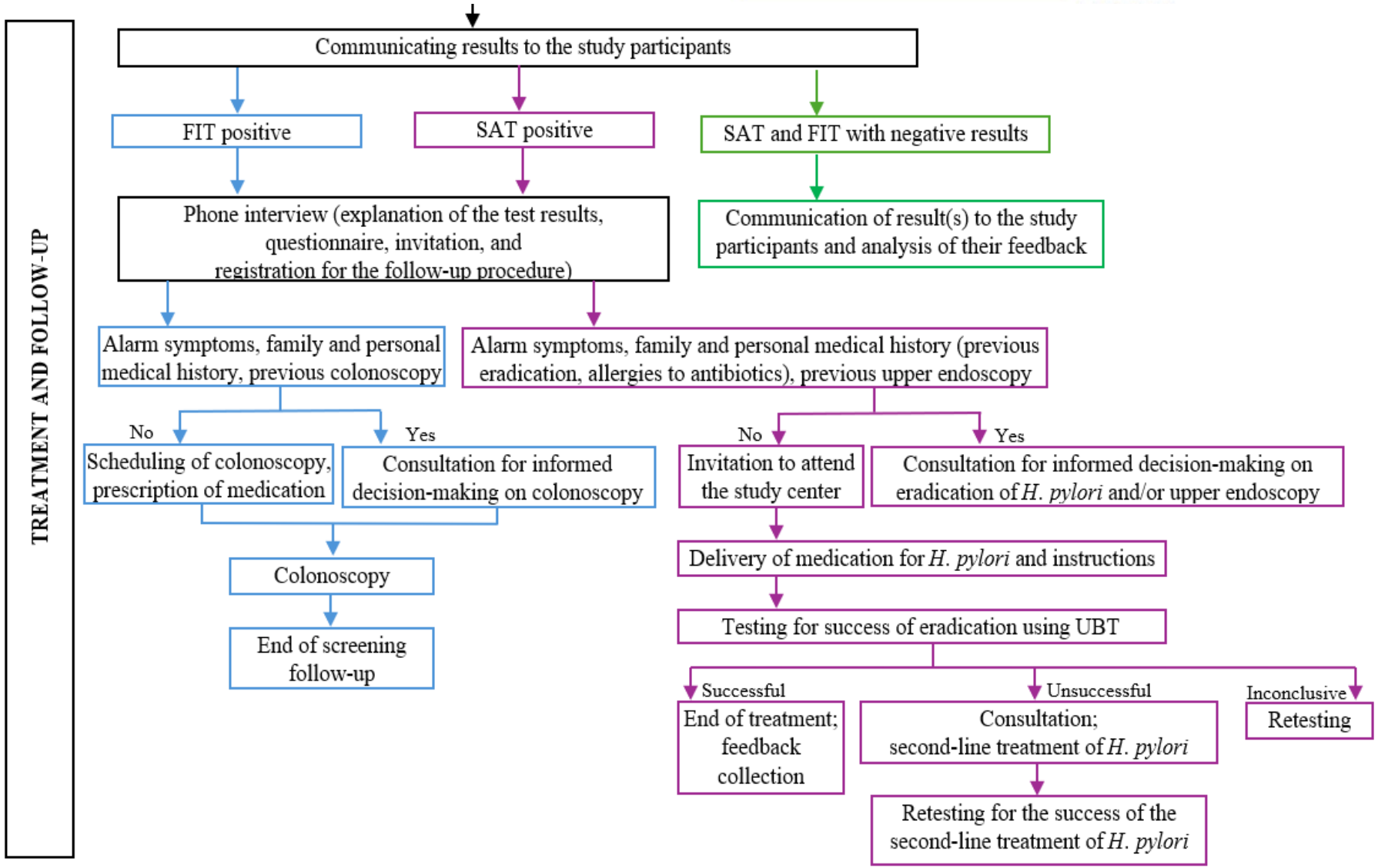
EUGastScreen pilot study

Co-funded by the European Union

Flow chart (part 1)



Flow chart (part 2)



European Code Against Cancer

5th edition

14 ways you can help prevent cancer

1 Smoking

Do not smoke. Do not use any form of tobacco, or vaping products. If you smoke, you should quit.

2 Exposure to other people's tobacco smoke

Keep your home and car free of tobacco smoke.

3 Overweight and obesity

Take action to avoid or manage overweight and obesity:

- Limit food high in calories, sugar, fat, and salt.
- Limit drinks high in sugar. Drink mostly water and unsweetened drinks.
- Limit ultra-processed foods.

4 Physical activity

Be physically active in everyday life. Limit the time you spend sitting

5 Diet

Eat whole grains, vegetables, legumes, and fruits as a major part of your daily diet. Limit red meat, and avoid processed meat.

6 Alcohol

Avoid alcoholic drinks.

7 Breastfeeding

Breastfeed your baby for as long as possible.

8 Sun exposure

Avoid too much sun exposure, especially for children. Use sun protection. Never use sunbeds.

9 Cancer-causing factors at work

Inform yourself about cancer-causing factors at work, and call on your employer to protect you against them. Always follow health and safety instructions at your workplace.

10 Indoor radon gas

Inform yourself about radon gas levels in your area by checking a local radon map. Seek professional help to measure levels in your home and, if necessary, reduce them.

11 Air pollution

Take action to reduce exposure to air pollution by:

- Using public transportation, and walking or cycling instead of using a car
- Choosing low-traffic routes when walking, cycling, or exercising
- Keeping your home free of smoke by not burning materials such as coal or wood
- Supporting policies that improve air quality.

12 Cancer-causing infections

- Vaccinate girls and boys against hepatitis B virus and human papillomavirus (HPV) at the age recommended in your country.
- Take part in testing and treatment for hepatitis B and C viruses, human immunodeficiency virus (HIV), and *Helicobacter pylori*, as recommended in your country.

13 Hormone replacement therapy

If you decide to use hormone replacement therapy (for menopausal symptoms) after a thorough discussion with your health-care professional, limit its use to the shortest duration possible.

14 Organized cancer screening programmes

Take part in organized cancer screening programmes, as recommended in your country, for:

- Bowel cancer
- Breast cancer
- Cervical cancer
- Lung cancer.

International Agency for Research on Cancer
World Health Organization

Co-funded by the European Union

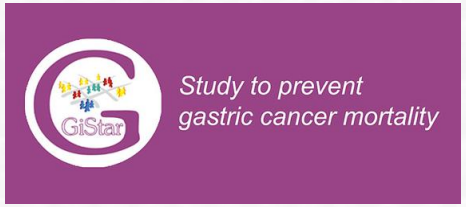
29 January 2026

INFECTIONS | STOMACH CANCER

IARC convenes the EC-GaC Working Group to develop the first European guidelines for gastric cancer prevention within the EU-GAINS project

The guideline is expected to be finalized by the end of 2027

ACKNOWLEDGEMENTS



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