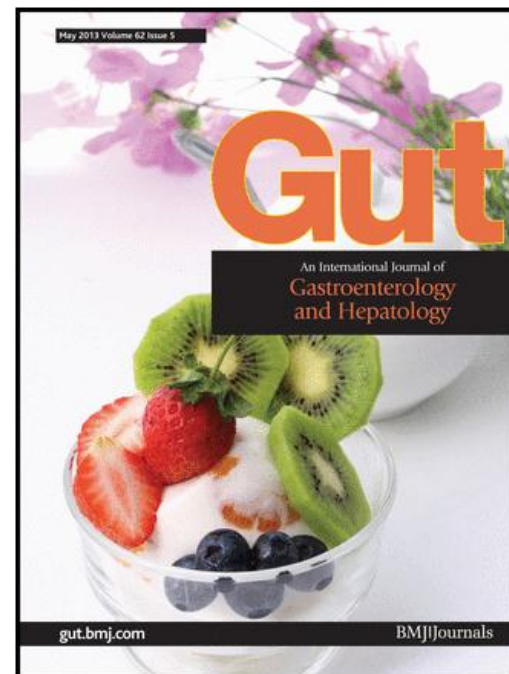


ORIGINAL ARTICLE

The benefit of mass eradication of *Helicobacter pylori* infection: a community-based study of gastric cancer prevention

Yi-Chia Lee,^{1,2} Tony Hsiu-Hsi Chen,¹ Han-Mo Chiu,² Chia-Tung Shun,³ Hung Chiang,⁴ Tzeng-Ying Liu,⁵ Ming-Shiang Wu,^{2,6} Jaw-Town Lin²

Gut 2013;**62**:676–682.



Introduction

The Lancet · Saturday 16 June 1984

**UNIDENTIFIED CURVED BACILLI IN THE
STOMACH OF PATIENTS WITH GASTRITIS
AND PEPTIC ULCERATION***

BARRY J. MARSHALL

J. ROBIN WARREN

*Departments of Gastroenterology and Pathology,
Royal Perth Hospital, Perth, Western Australia*

Patients and Methods

Patients

All patients referred for gastroscopy on clinical grounds were eligible for the study which continued until there were 100 participants who gave informed consent and in whom biopsy was considered to be safe. The study was approved by our hospital's human rights committee.

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TABLE II—ASSOCIATION OF BACTERIA WITH ENDOSCOPIC DIAGNOSES

Endoscopic appearance*	Total	With bacteria	p
Gastric ulcer	22	18 (77%)	0·0086
Duodenal ulcer	13	13 (100%)	0·0004†
All ulcers	31	27 (87%)	0·00005
Oesophagus abnormal	34	14 (41%)	0·996
Gastritis†	42	23 (55%)	0·78
Duodenitis†	17	9 (53%)	0·77
Bile in stomach	12	7 (58%)	0·62
Normal	16	8 (50%)	0·84
Total	100	58 (58%)	

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Total	100	58 (58%)	

- H. pylori is a class 1 carcinogen
- Until now, prospective studies about reduction of GC have only shown slight effects

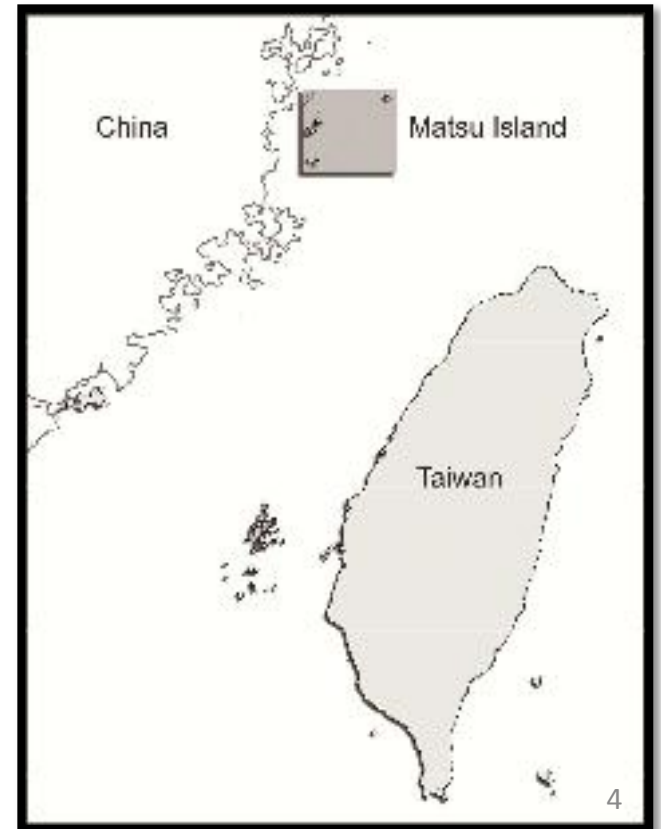
Fuccio L et al. Meta-analysis: can Helicobacter pylori eradication treatment reduce the risk for gastric cancer? Ann Intern Med 2009;151:516.

- Real world effect of H. pylori eradication for GC-prevention has still to be established

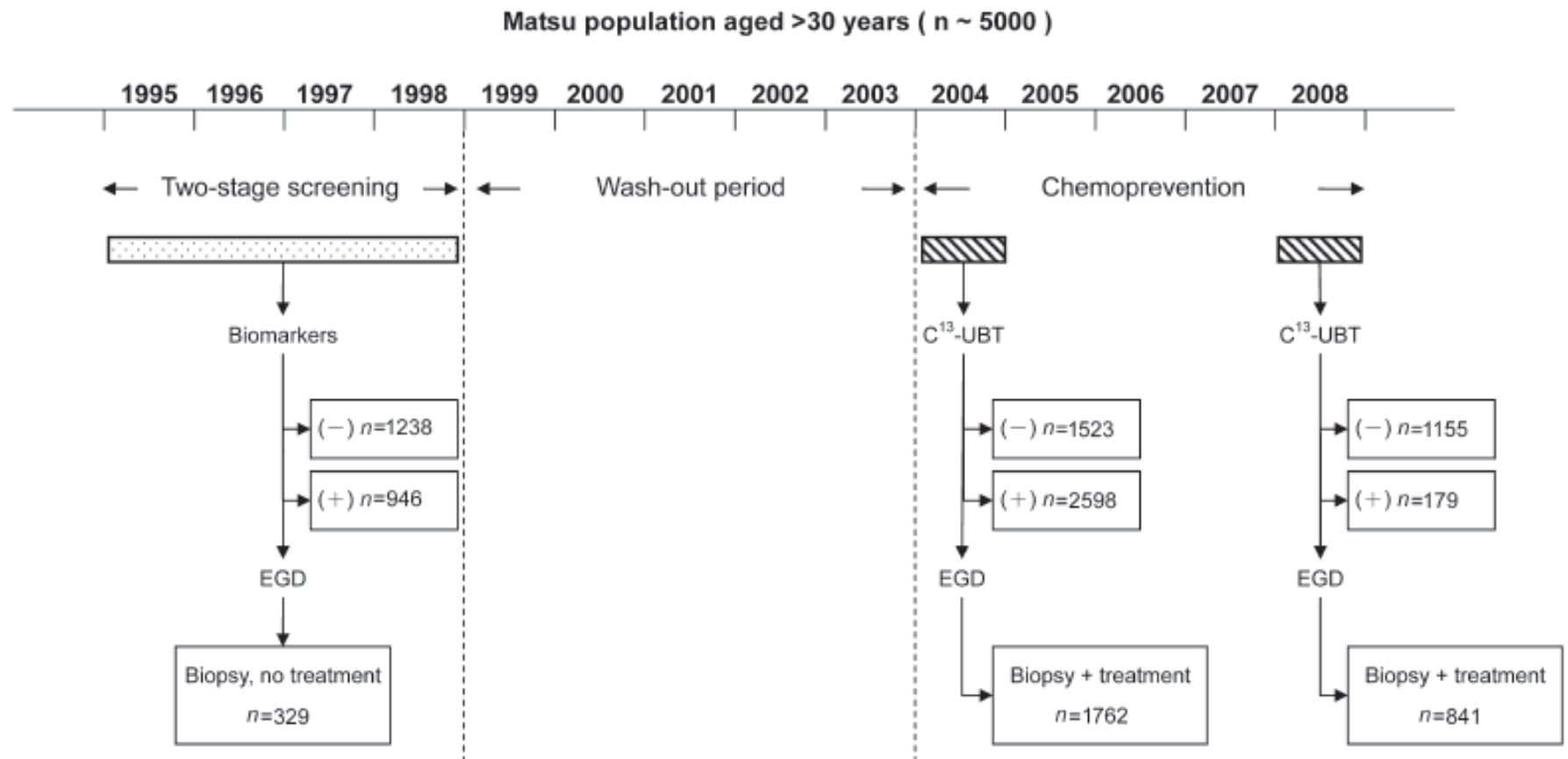
- Endoscopic GC-screening 1995-1998 on Matsu island has shown only a limited effect
- From 2004 H. Pylori eradication program was launched

=> Comparison 1995-2004
vs. 2004-2008:

1. Premalignant lesions
2. GC incidence/mortality
3. HP prevalence



Methods

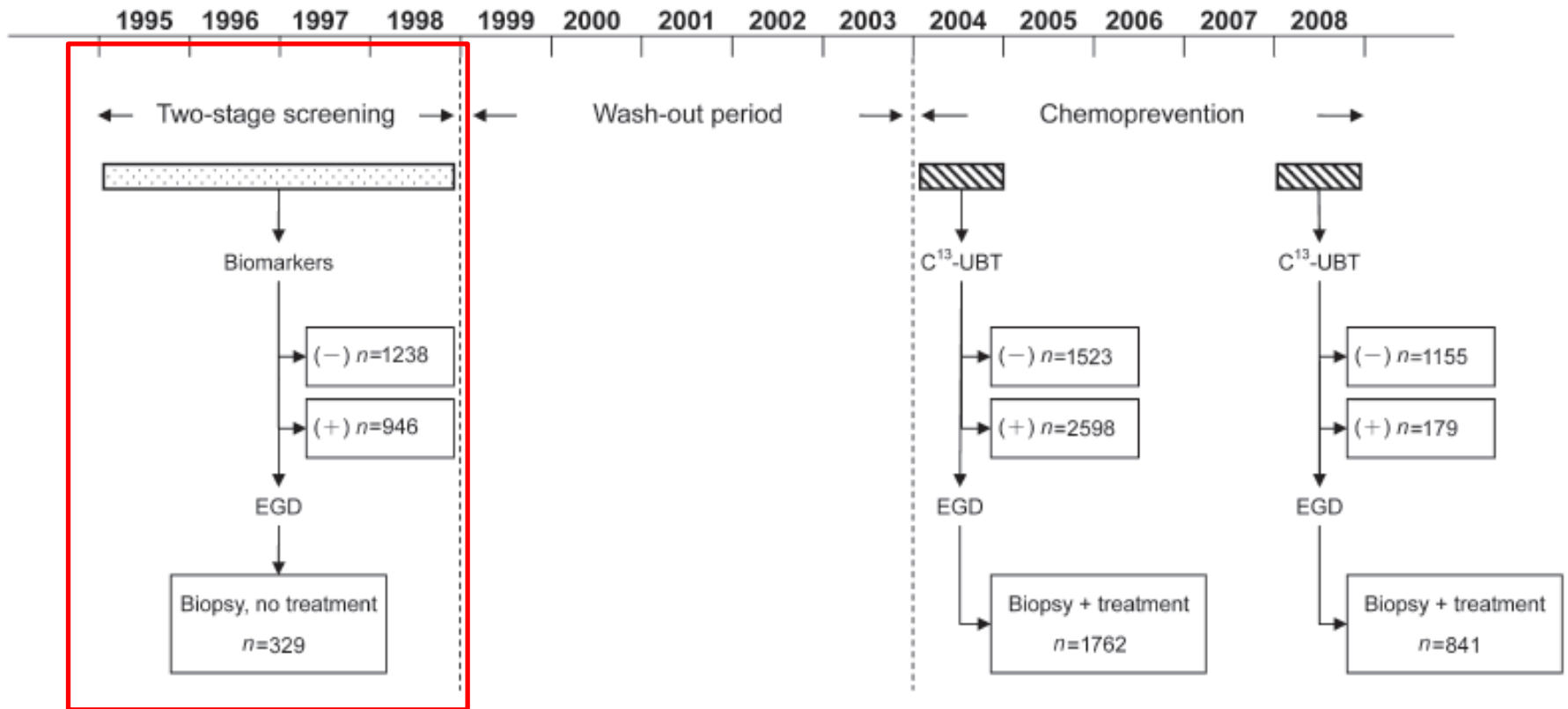


☐ Pepsinogen test, *H. pylori* antibody, and endoscopic examination (1995 → 1998)

▨ Test and treatment for *H. pylori* infection, and endoscopic examination (2004 and 2008)

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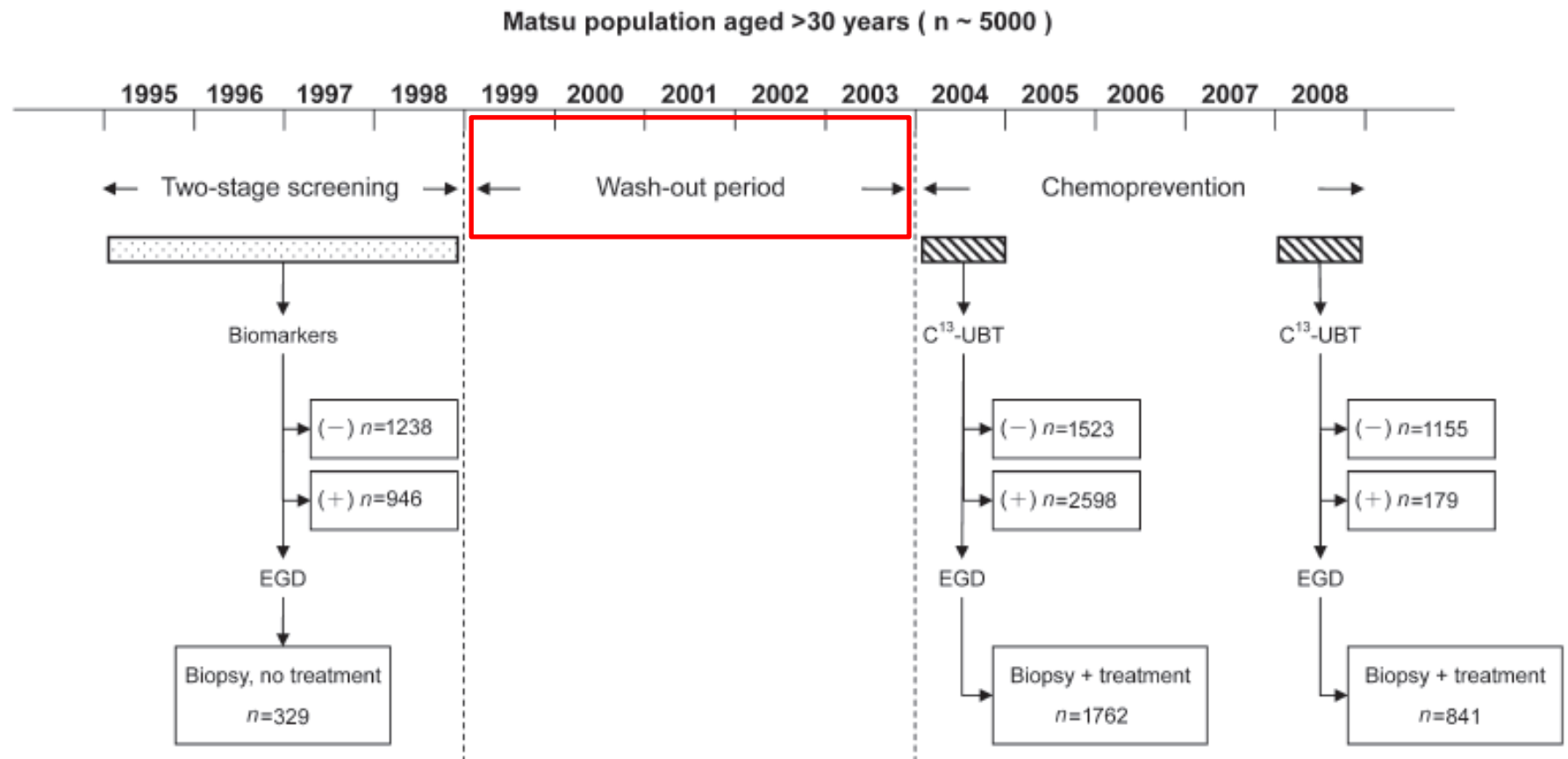
Matsu population aged >30 years (n ~ 5000)



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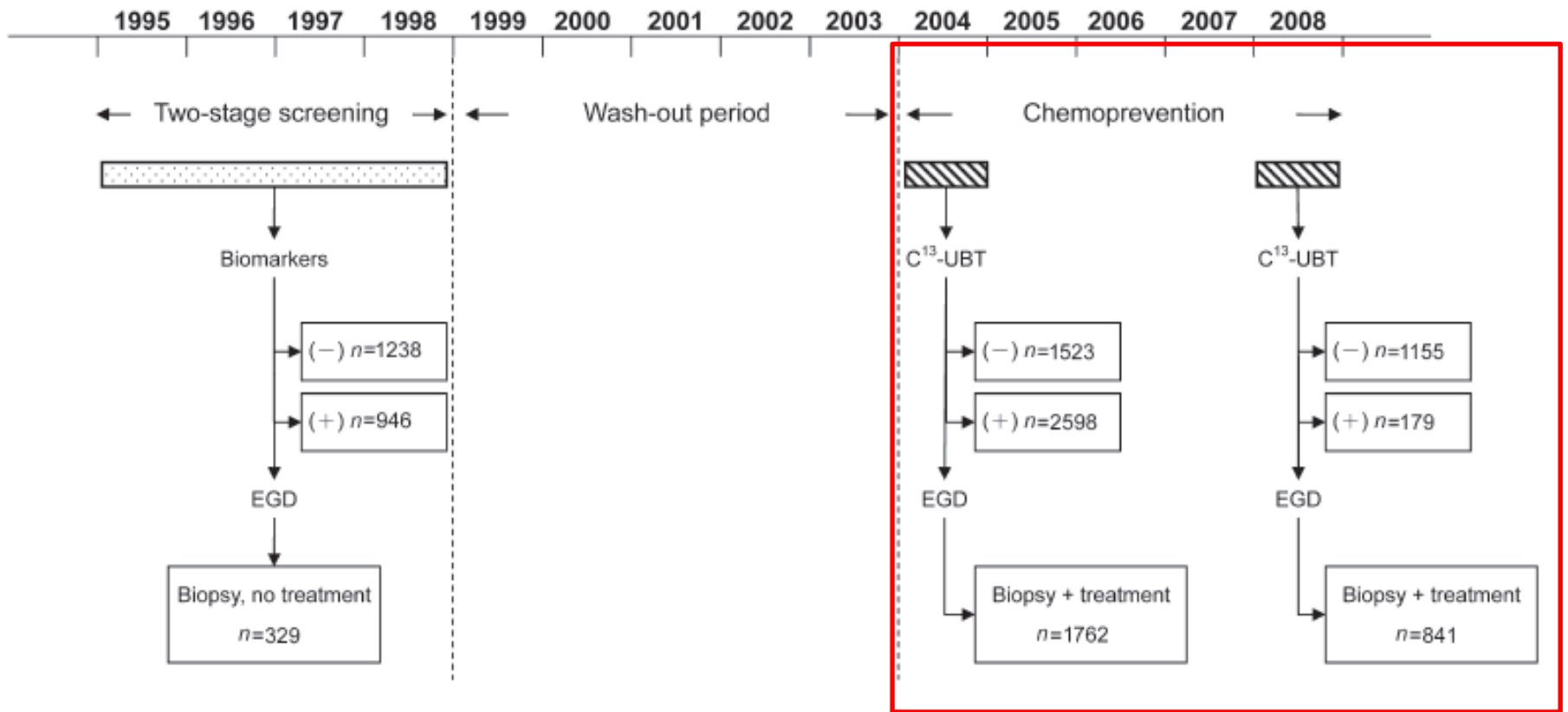


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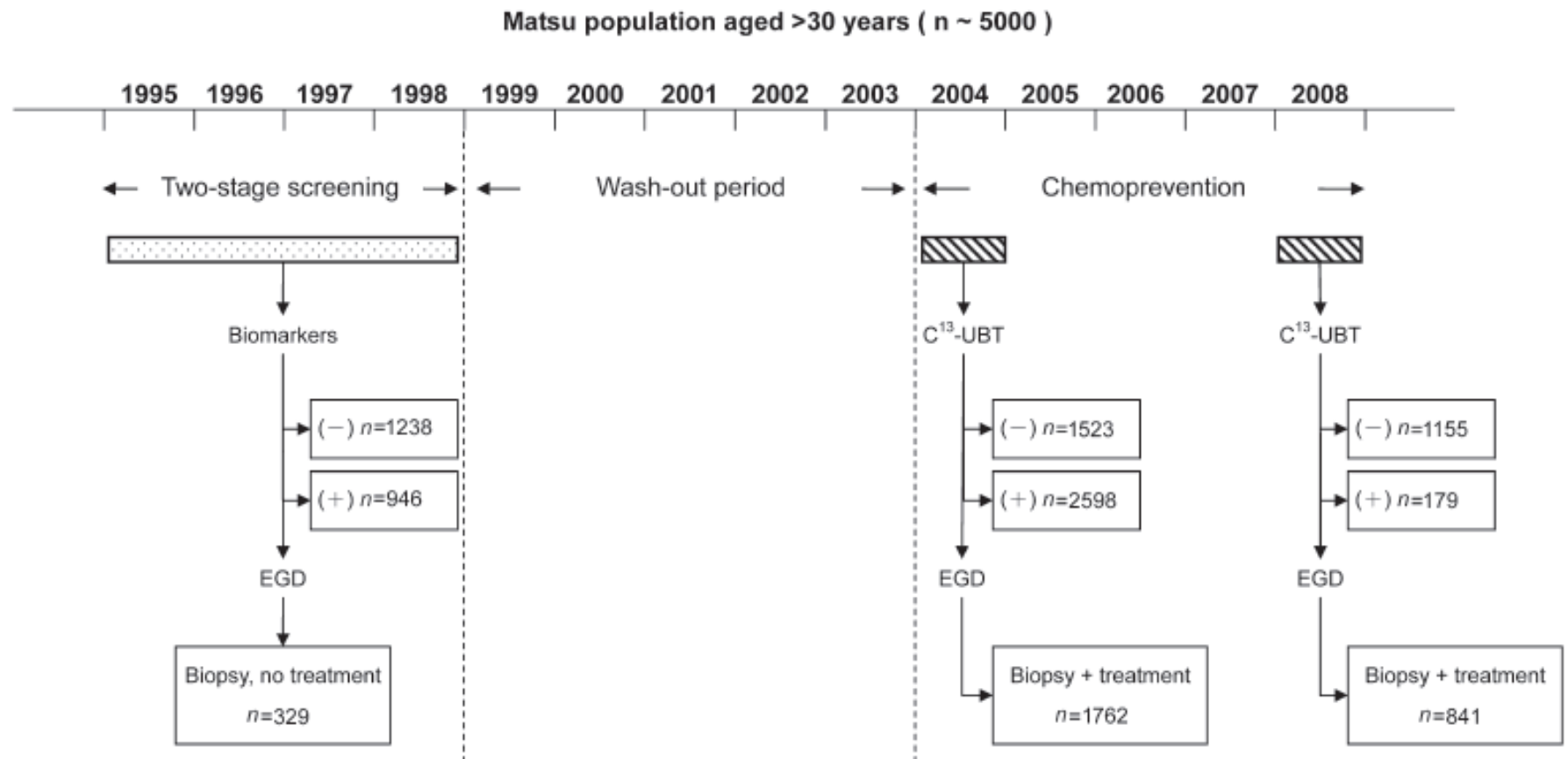
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Results

- 4121 participants 2004 (1762 endoscopies)
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-> 1334 participants 2008 (841 endoscopies)
 - 1169 (66.3%) received 13C-UBT 2008
 - 841 (71.9%) had endoscopy 2008
- 

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=> Population-level effectiveness 78.7%

Table 1 Changes in the prevalence of gastric and oesophageal lesions before and after mass eradication of *Helicobacter pylori* infection

Outcome variable	Before chemoprevention	After chemoprevention
Number of population	1762	841
Gastric atrophy	1056 (59.9)	115 (13.7)
Intestinal metaplasia	558 (31.7)	327 (38.9)
Indefinite for dysplasia	142 (8.1)	128 (15.2)
Low-grade dysplasia	6 (0.3)	17 (2.0)
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**Effectiveness
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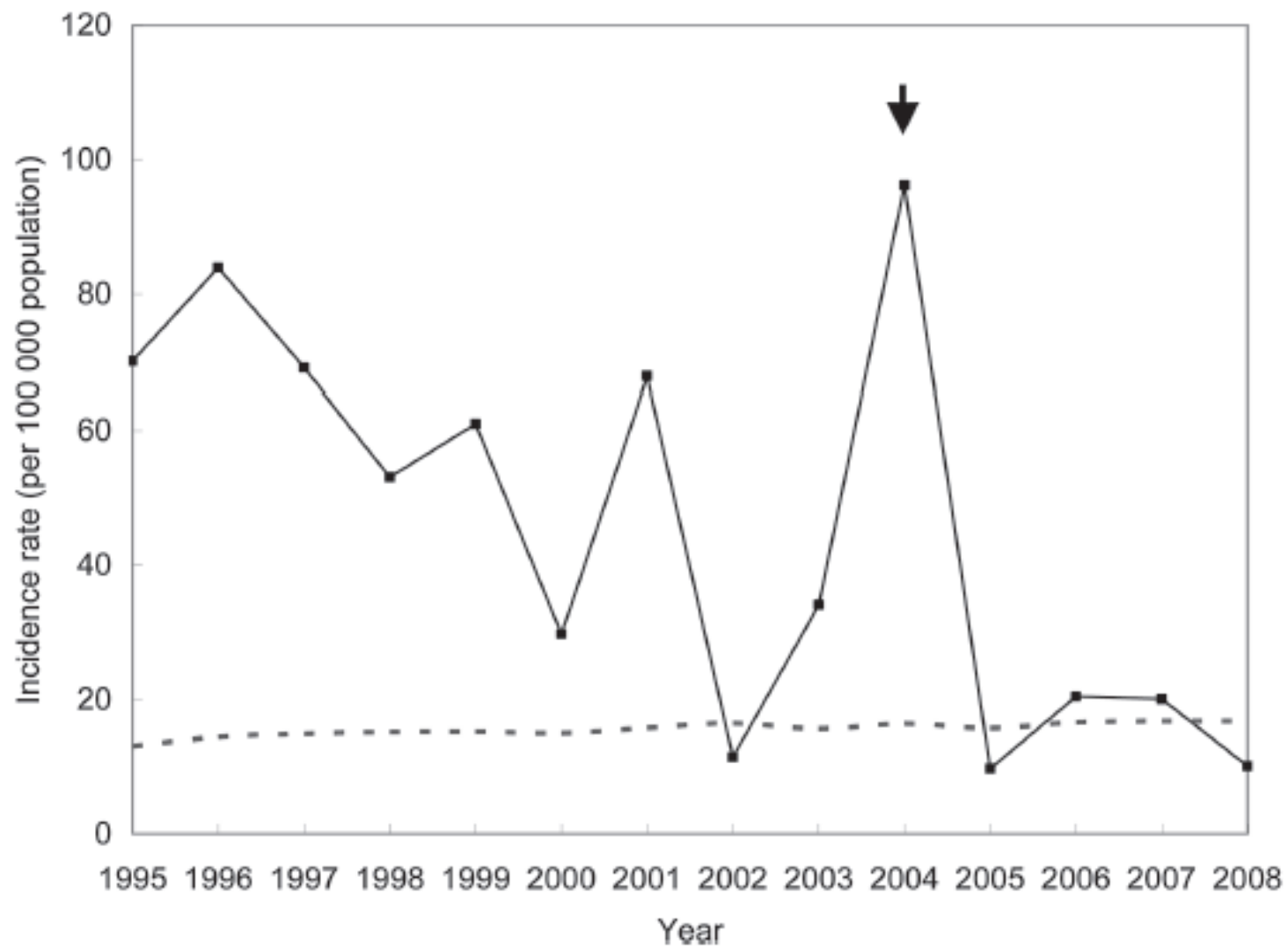
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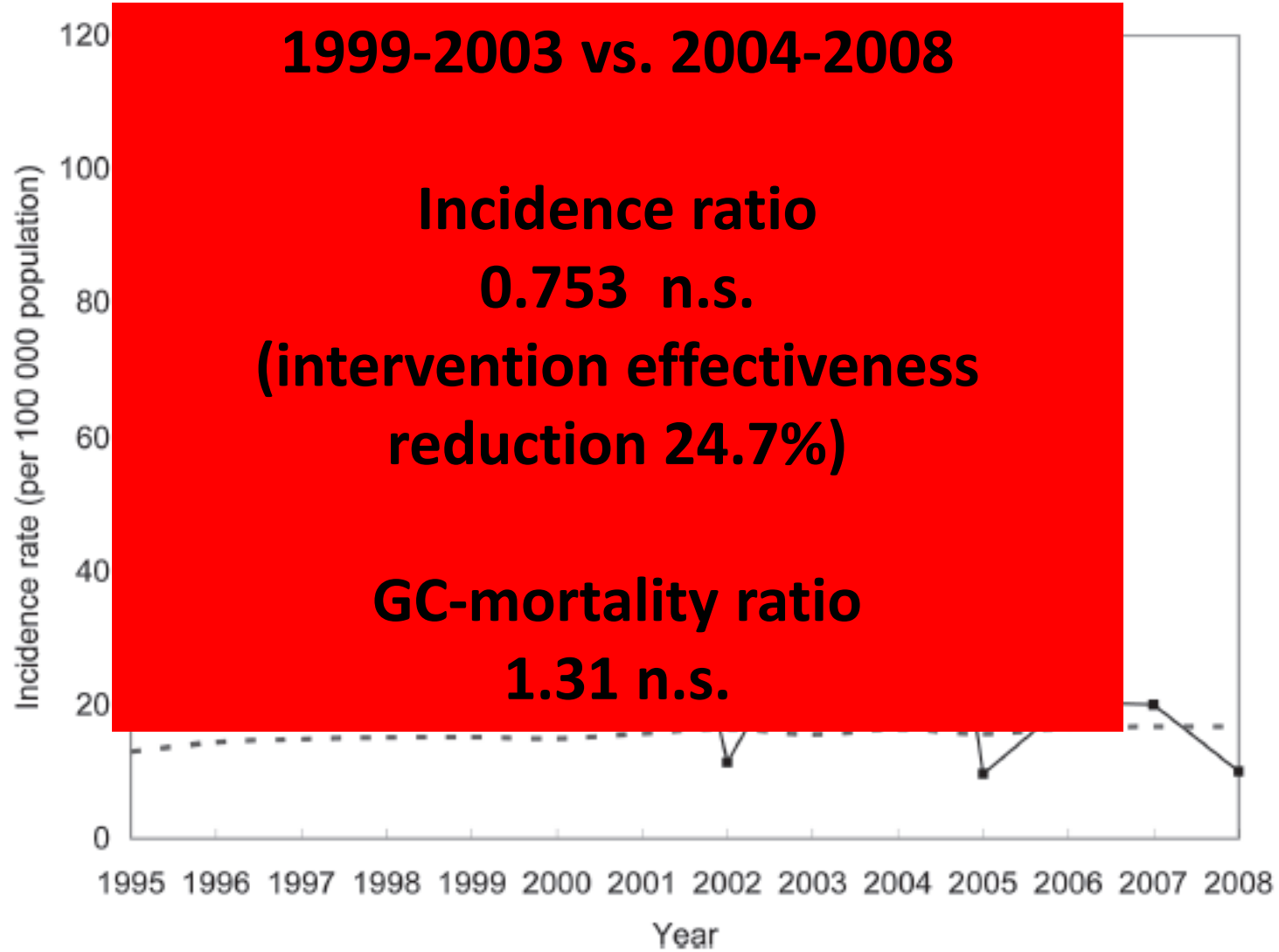
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Appendix Table 4: Number of subjects at risk, number of incident cases, incidence rates of gastric cancer per 100,000 subjects, and standardized incidence ratios in the reference population in Taiwan per year of the study period.

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
No. of subjects	5,711	5,959	7,240	7,536	6,560	6,733	8,851	8,763	8,806	9,359	10,345	9,786	9,965	9,961
No. of gastric cancers	4	5	5	4	4	2	6	1	3	9	1	2	2	1
Incidence rate	70.040	83.914	69.061	53.079	60.976	29.704	67.789	11.412	34.068	96.164	9.667	20.437	20.070	10.039
SIR	5.034	5.154	3.799	3.378	3.395	1.707	4.055	0.650	2.030	5.564	0.599	1.184	1.187	0.619



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Appendix Table 1: Estimated treatment effectiveness for prevention of gastric atrophy and intestinal metaplasia using an extrapolation method based on Poisson regression models, after adjustment for the declining incidence rates related to improved sanitation and hygiene.

	Gastric atrophy	Intestinal metaplasia	Gastric cancer	Gastric cancer mortality
Observed number (<i>O</i>)	7	130	15	13
Expected number (<i>E</i>)	18	68	10.7	3.3
<i>O/E</i> (95% CI)	0.39 (0.185 to 0.815)	1.91 (1.608 to 2.268)	1.40 (0.845 to 2.325)	3.94 (2.288 to 6.785)
1 – <i>O/E</i> (95% CI)	0.61 (0.185 to 0.815)	-0.91 (-0.608 to -1.268)	-0.40 (-1.325 to 0.155)	-2.94 (-1.288 to -5.785)

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O/E (95% CI)	10.7		3.3	
1 - O/E (95% CI)	1.40 (0.845 to 2.325)		3.94 (2.288 to 6.785)	
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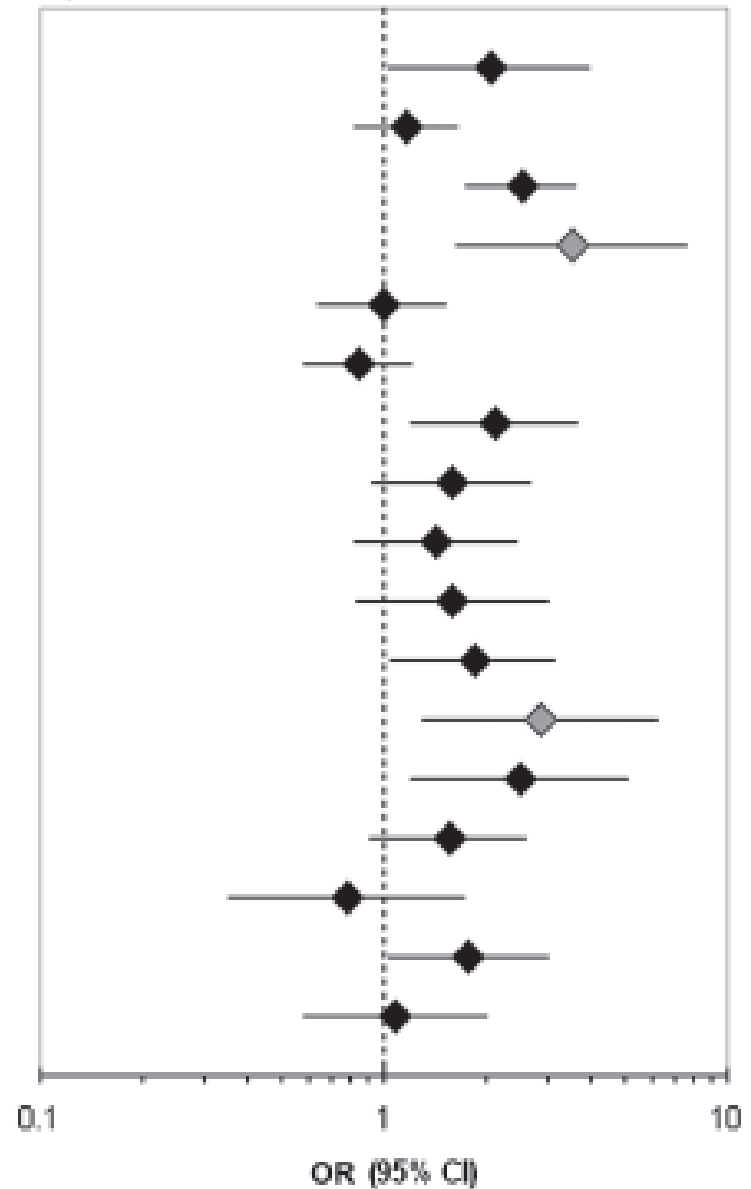
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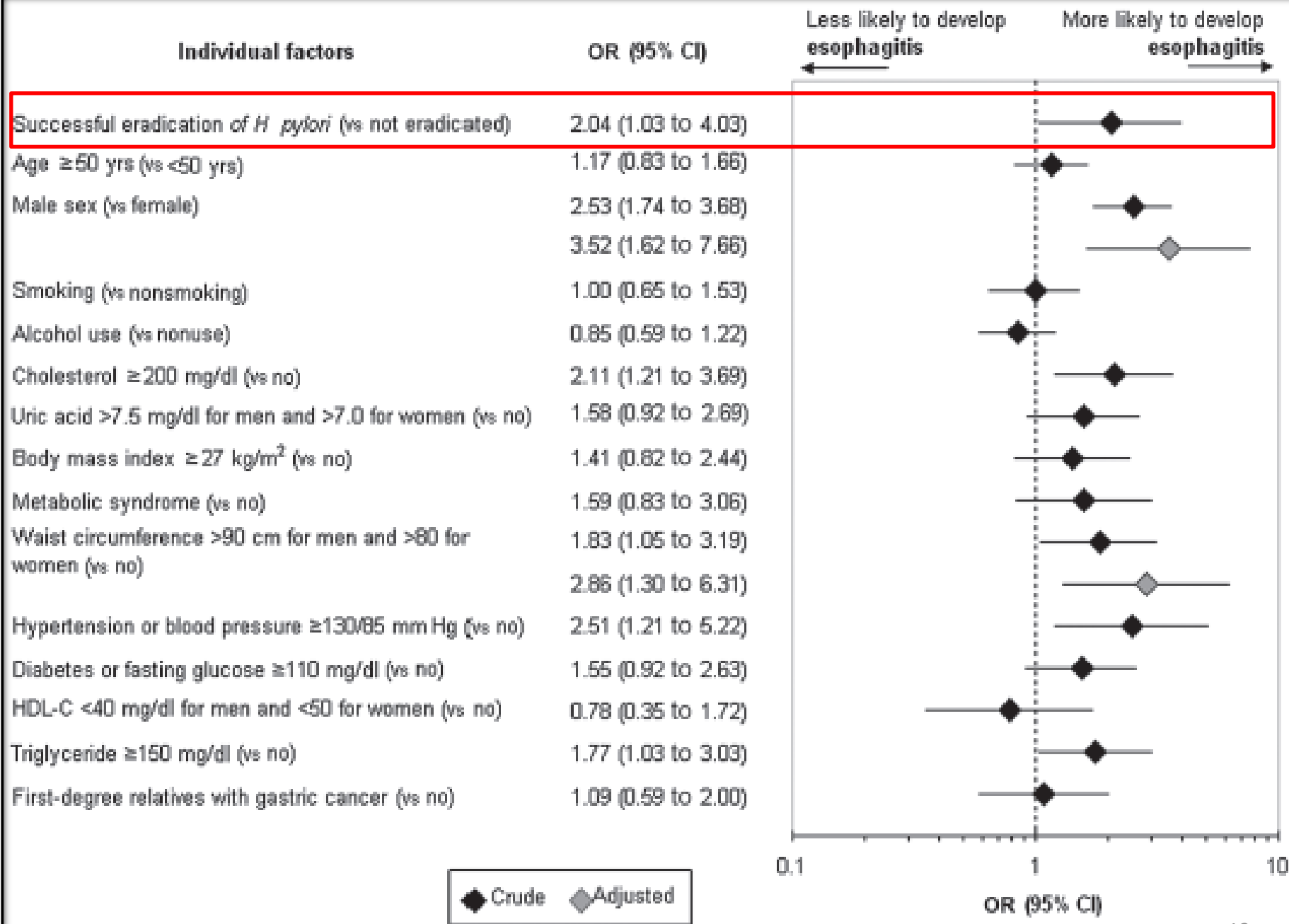
Individual factors

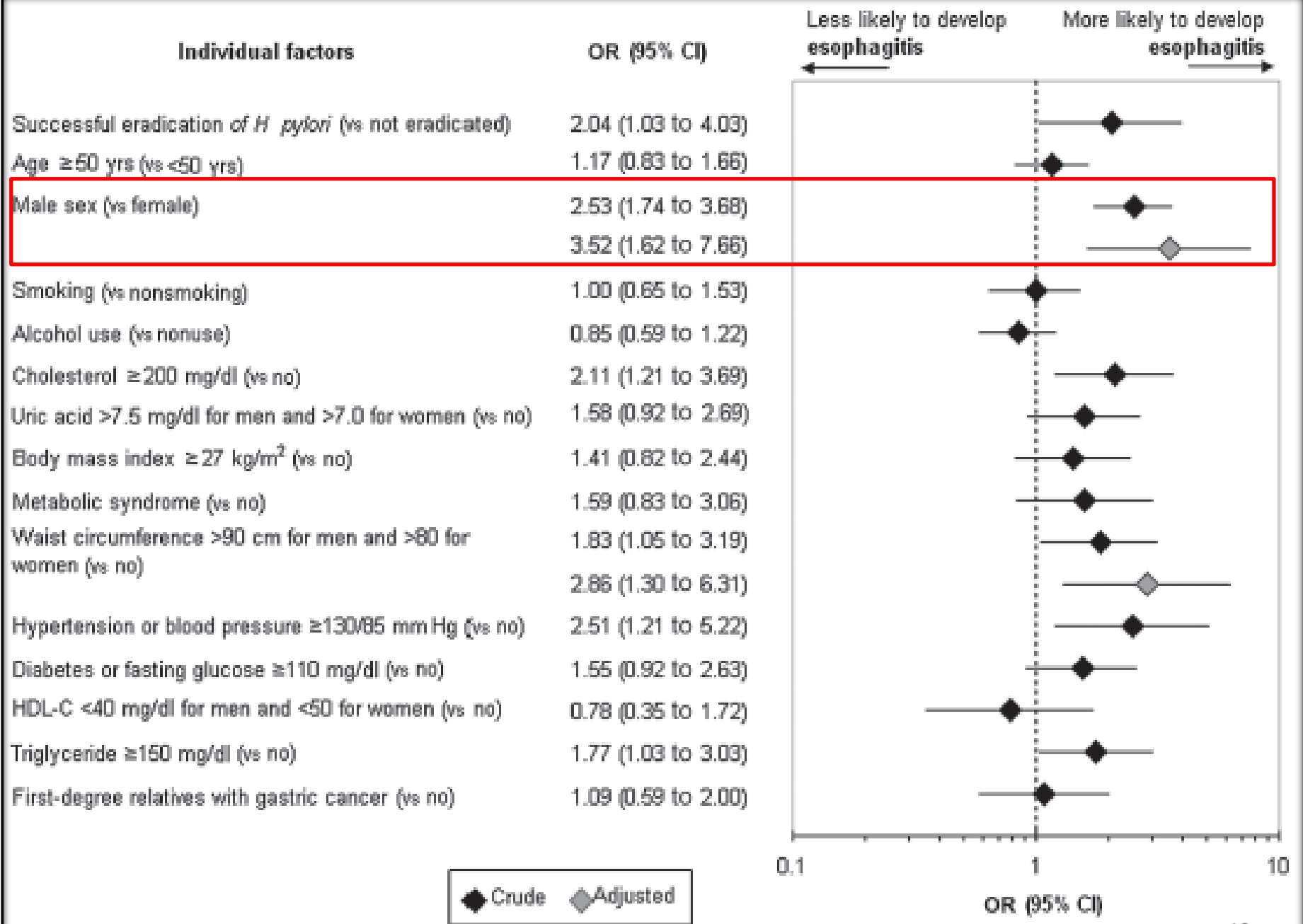
OR (95% CI)

← **Less likely to develop esophagitis** **More likely to develop esophagitis** →

Successful eradication of <i>H. pylori</i> (vs not eradicated)	2.04 (1.03 to 4.03)
Age ≥50 yrs (vs <50 yrs)	1.17 (0.83 to 1.66)
Male sex (vs female)	2.53 (1.74 to 3.68)
	3.52 (1.62 to 7.66)
Smoking (vs nonsmoking)	1.00 (0.65 to 1.53)
Alcohol use (vs nonuse)	0.85 (0.59 to 1.22)
Cholesterol ≥200 mg/dl (vs no)	2.11 (1.21 to 3.69)
Uric acid >7.5 mg/dl for men and >7.0 for women (vs no)	1.58 (0.92 to 2.69)
Body mass index ≥27 kg/m ² (vs no)	1.41 (0.82 to 2.44)
Metabolic syndrome (vs no)	1.59 (0.83 to 3.06)
Waist circumference >90 cm for men and >80 for women (vs no)	1.83 (1.05 to 3.19)
	2.86 (1.30 to 6.31)
Hypertension or blood pressure ≥130/85 mm Hg (vs no)	2.51 (1.21 to 5.22)
Diabetes or fasting glucose ≥110 mg/dl (vs no)	1.55 (0.92 to 2.63)
HDL-C <40 mg/dl for men and <50 for women (vs no)	0.78 (0.35 to 1.72)
Triglyceride ≥150 mg/dl (vs no)	1.77 (1.03 to 3.03)
First-degree relatives with gastric cancer (vs no)	1.09 (0.59 to 2.00)







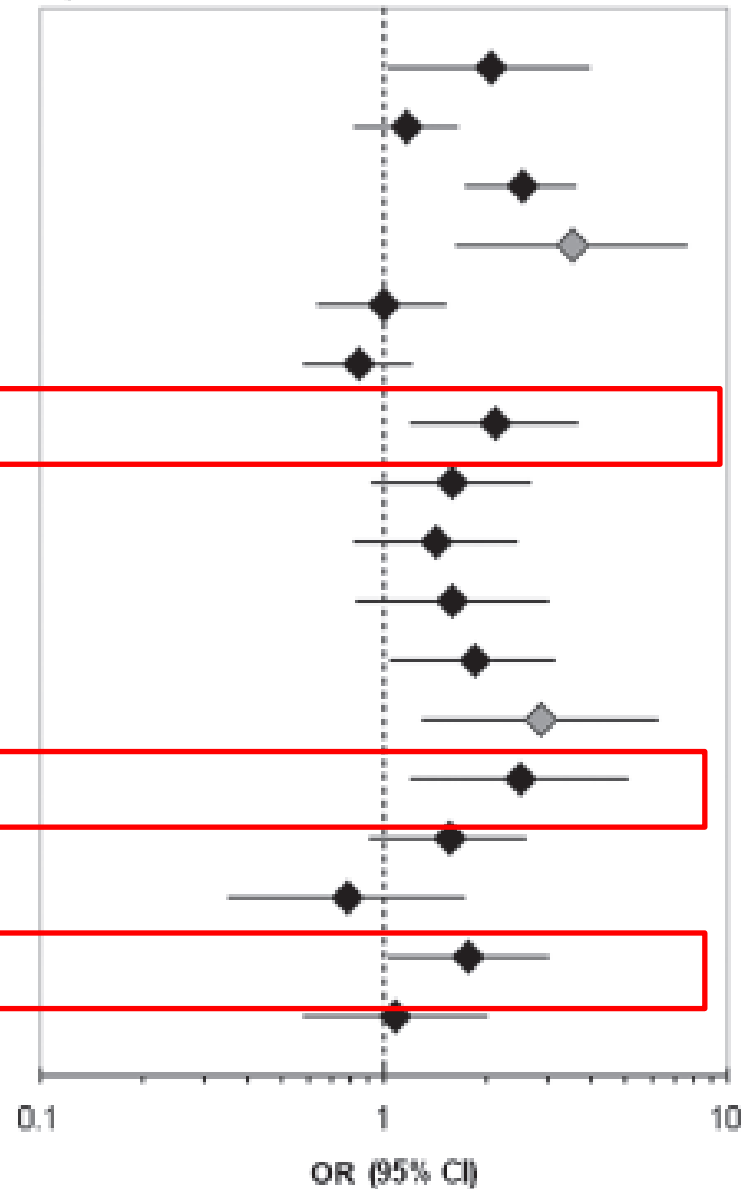
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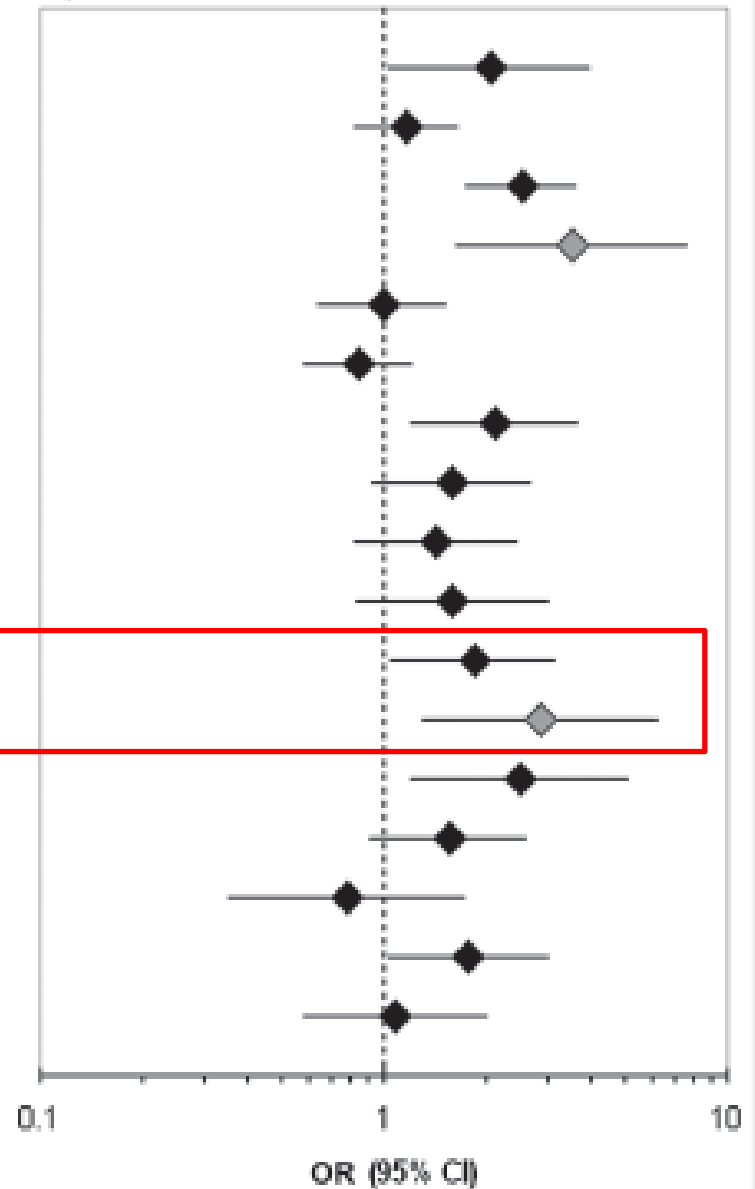


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Discussion

- Effectiveness 77.2% of the HP eradication program
- Reinfection rate 1%/year
- Increase in reflux esophagitis vs. decrease of peptic ulcer disease
- Reduction of gastric atrophy could lead to a reduced incidence of GC
- No reduction of intestinal metaplasia
 - Point of now return?
- No direct evidence of GC incidence reduction yet
 - Follow-up period too short?