KCA-DDF Joint Symposium (June, the 18th, 2021)

Gastric Cancer Screening in Japan

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Department of Gastroenterology

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KCA-DDF Joint Symposium
COI Disclosure

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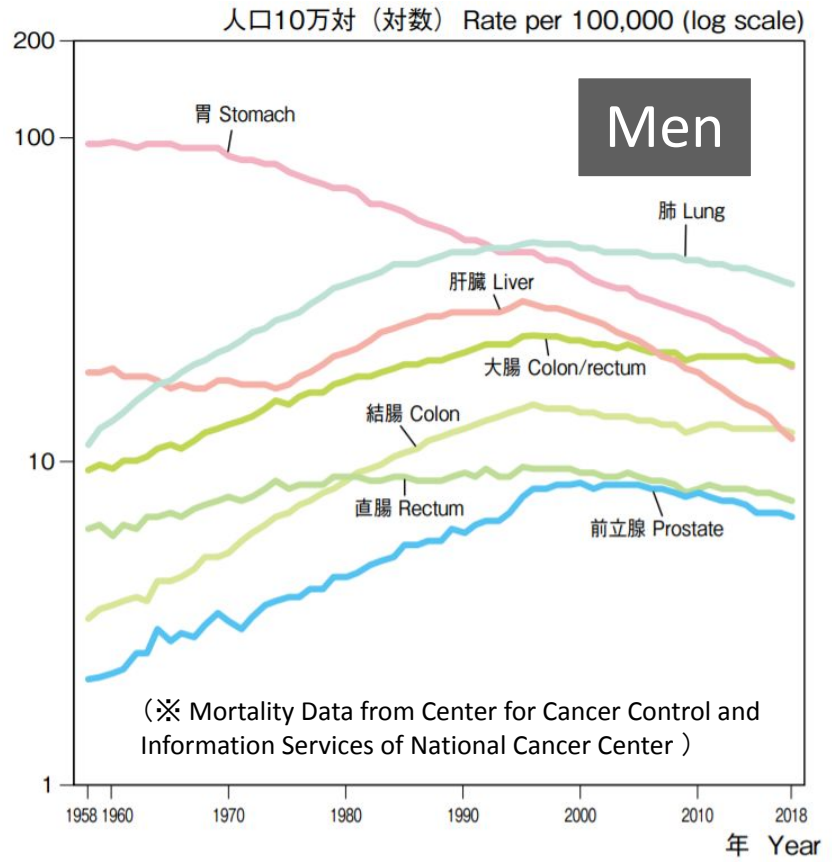
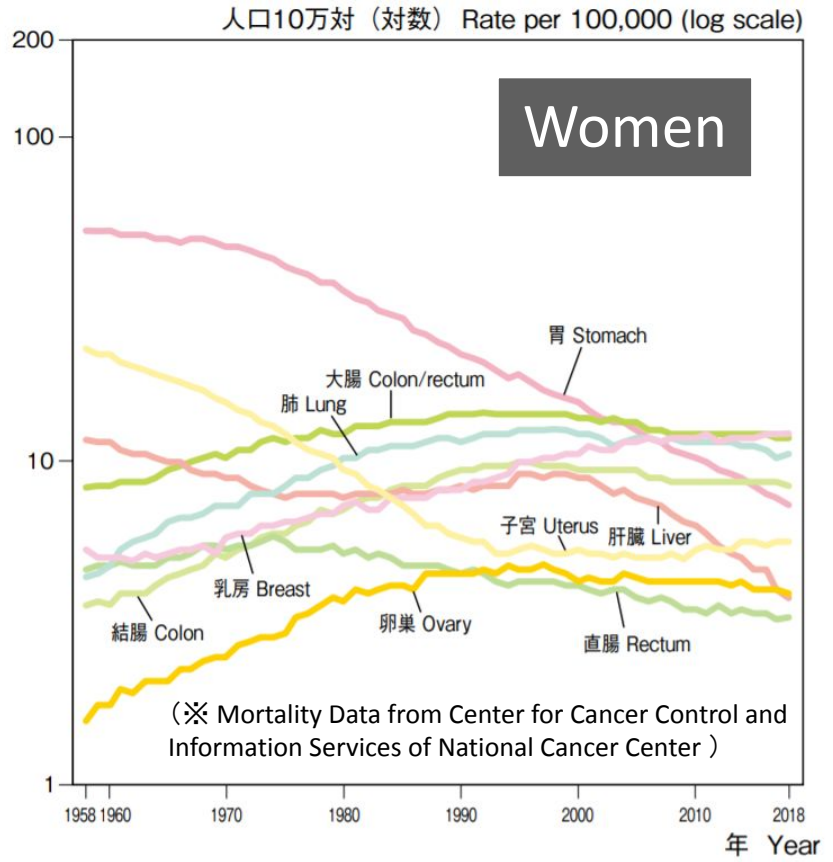
There are no COI with regard to this presentation.

Mortality and Incidence of Gastric Cancer in Japan

In 2019, mortality of gastric cancer was 42,931/yr（men：28,043/yr, women: 14,888/yr）.





In 2017, incidence of gastric cancer was 129,476/yr（men：89,331/yr, women: 40,145/yr）.

Though the mortality and incidence of gastric cancer is gradually decreasing nationwide, it is still the 2nd common malignancy and the 3rd leading cause of cancer deaths in Japan.

History of Population-based Gastric Cancer Screening in Japan

1956 About 3000 people were checked by barium X-ray in Nagano prefecture
(The X-ray system to screen tuberculosis was applied for gastric screening)

1960s The buses made for X-ray based gastric screening started to be used

1960s Upper gastrointestinal double-contrast barium X-ray technique for gastric cancer screening was established by Shirakabe et al.

1966 Gastric screening with X-ray started to be covered by National Treasury.

1983 Gastric screening was formally approved by national law called "Law of Health and Medical Services for the Elderly".

In 1983, *H. pylori* was discovered.

1998 National support for gastric cancer screening was ceased and transferred to local government instead.

2000s Gastric cancer screening by endoscopy was tentatively started by some local government, but has not been officially approved till 2016.

Since around 1990, upper GI endoscopy started to be used as gastric screening in Ningen-Doc.

2016 Upper gastrointestinal endoscopy was finally approved as one of the recommended methods for organized gastric cancer screening in Japan.

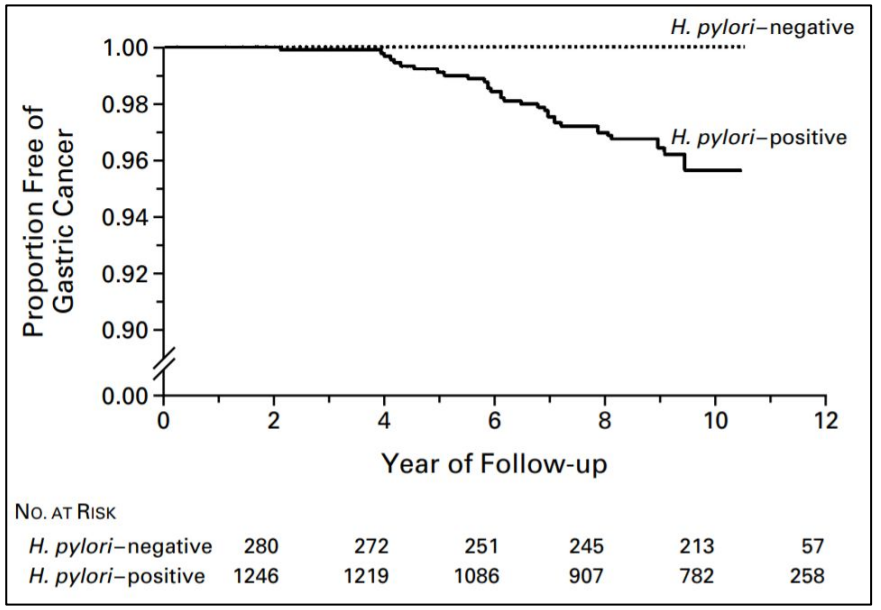
Gastric Cancer and *H. pylori* infection

Infection of *H. pylori* is a definitive risk factor for gastric cancer.

Prospective observation for 10 years

- Gastric cancer has not developed in *H. pylori* -negative group
- About 4% of *H. pylori* -positive group developed gastric cancer during the 10 years (36/1246)

(Uemura N et al. *N Engl J Med* 2001; 345:784-9)

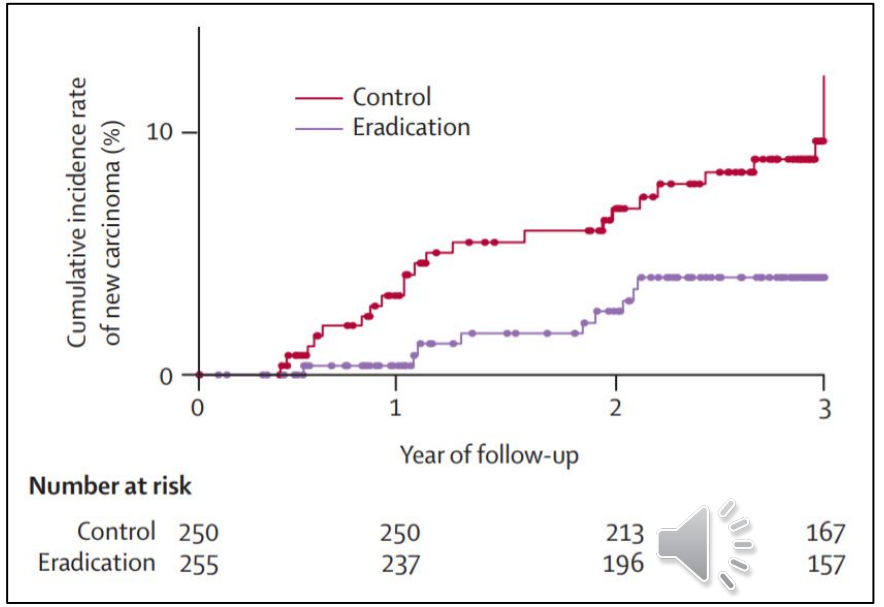


Suppressive but limited effects of *H. pylori* eradication on the development of metachronous gastric cancer.

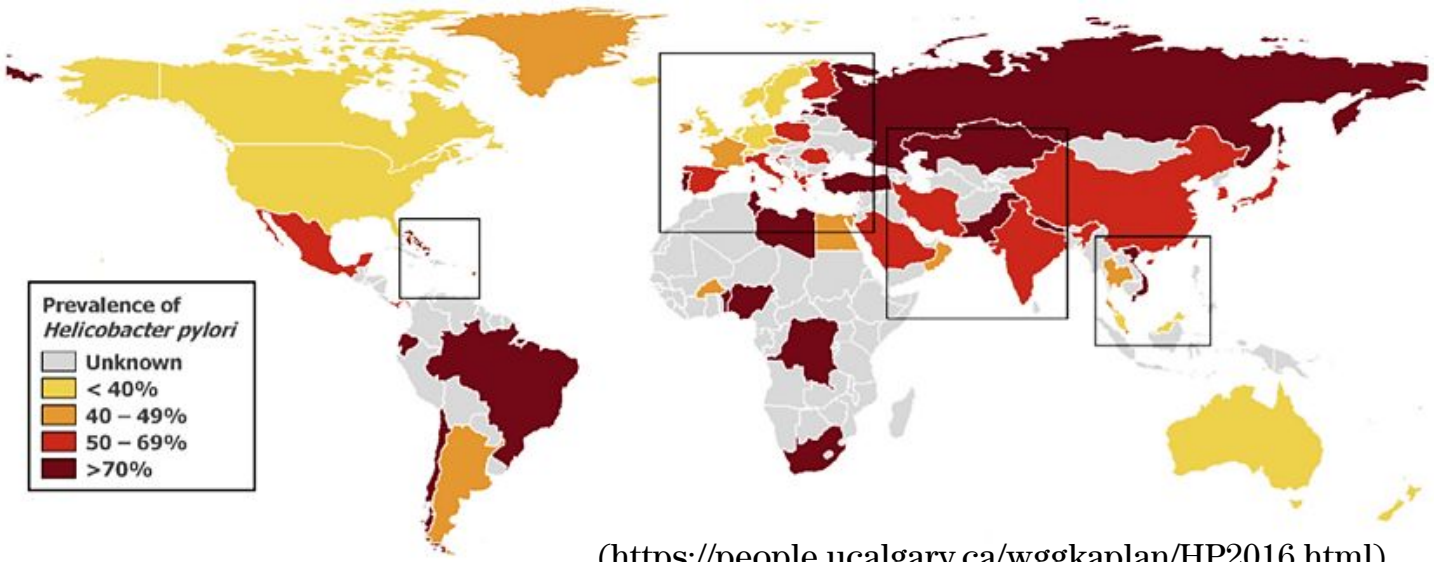
The prospective follow after endoscopic resection of gastric cancer showed that *H. pylori* eradication significantly decreased the risk of metachronous gastric tumorigenesis.

- In Japan, eradication therapy for *H. pylori*-induced gastritis was approved and started to be covered by medical insurance in 2013.

(Fukase K, et al. *Lancet* 2008; 372:392-397)



Prevalence of *H. pylori* infection worldwide and in Japan

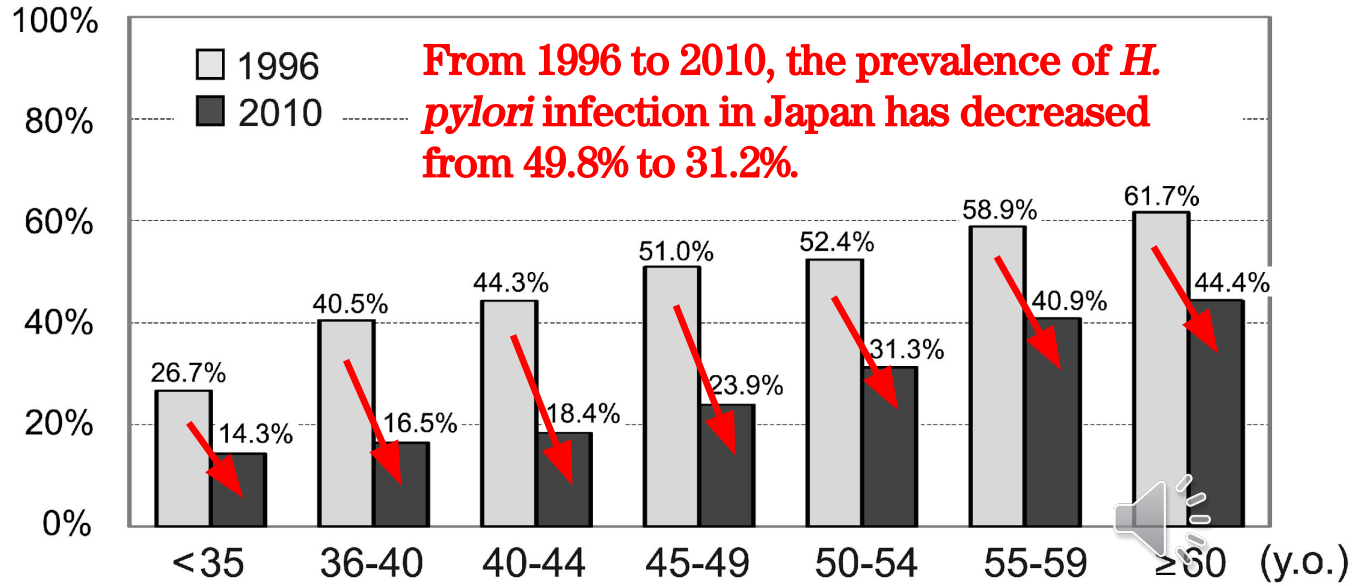


(https://people.ucalgary.ca/wggkaplan/HP2016.html)

The prevalence of *H. pylori* is usually high in developed countries, and it is also known to be quite high in East Asian countries. Recently, however, the infection rate of *H. pylori* is steadily declining worldwide.

Our large-scale cohort data of generally healthy people showed that the prevalence of *H. pylori* has rapidly decreased in Japan during the 14 years.

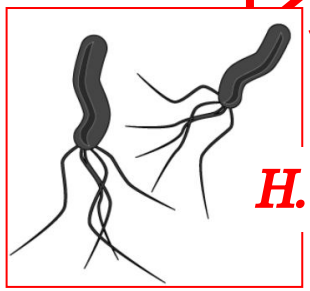
(Yamaji Y, et al. *Gut* 2001; 49: 335-40 ／ Yamamichi N, et al. *BMC Medicine* 2012; 10:45)



Reduced prevalence of *H. pylori* infection has changed the strategy against gastric cancer in Japan.

< Main route of gastric tumorigenesis >

Normal gastric mucosa → Chronic superficial gastritis → Atrophic gastritis → Intestinal metaplasia → Gastric Cancer



H. pylori

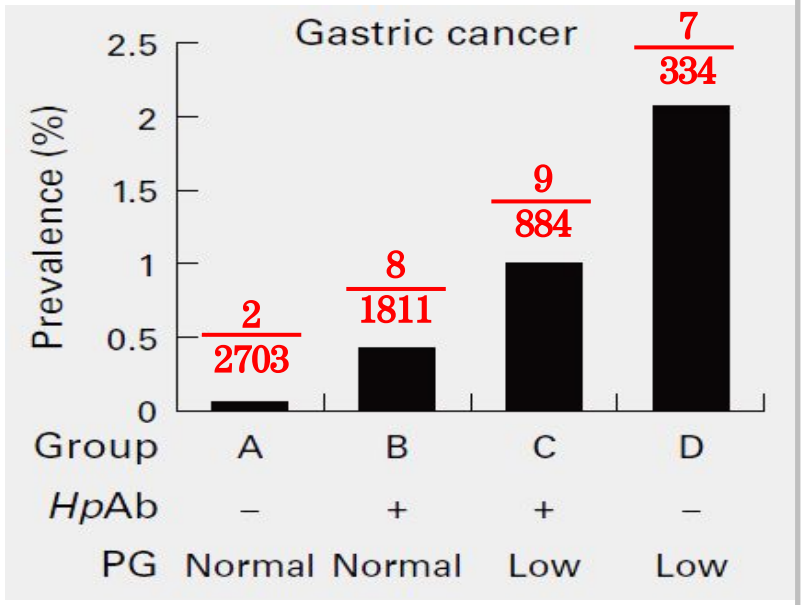
Reduced prevalence of *H. pylori* infection has made it possible to stratify the risk of gastric cancer based on its infection status: 1) current infection, 2) past infection, and 3) non-infection.

- Serum-based screening
- Endoscopy-based screening
- Barium X-Ray-based screening

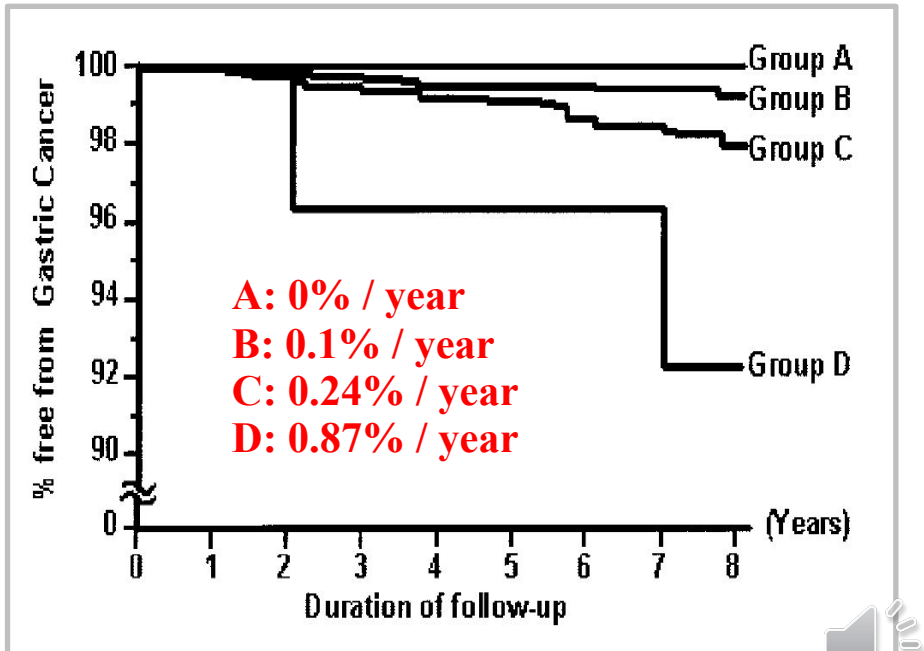
Risk stratification of gastric cancer development based on the serum anti-*H. pylori* IgG and serum pepsinogen level.

Since 1990s, the combination of serum anti-*H. pylori* IgG and pepsinogen (PG) test was reported to be useful to predict the risk of gastric cancer.

Based on the titer of serum anti-*H. pylori* IgG and serum pepsinogens, the subjects can be classified into Group A (HP-IgG (-), PG test (-)), Group B (HP-IgG (+), PG test (-)), Group C (HP-IgG (+), PG test (+)), and Group D (HP-IgG (-), PG test (+)). Many studies showed that gastric cancer risk increases from Group A to D in proportion to the severity of *H. pylori*-induced chronic gastritis.

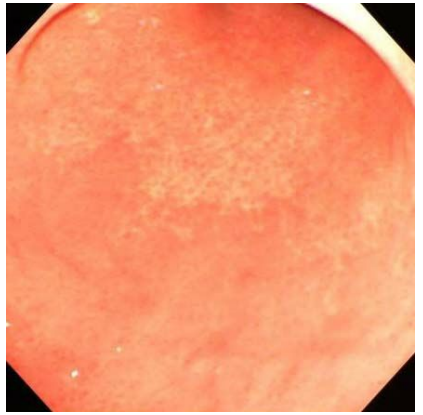


(Yamaji Y, Mitsushima T. *GUT* 2001; 49:335)



(Ohata H, Ichinose M. *Int J Cancer* 2004; 109:138)

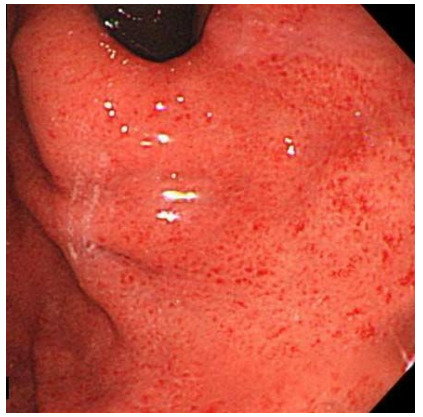
Risk stratification of gastric cancer development based on the evaluation of gastric mucosa by endoscopy (Kyoto Classification).

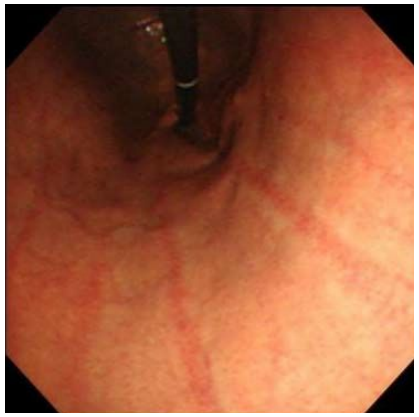

Diffuse redness

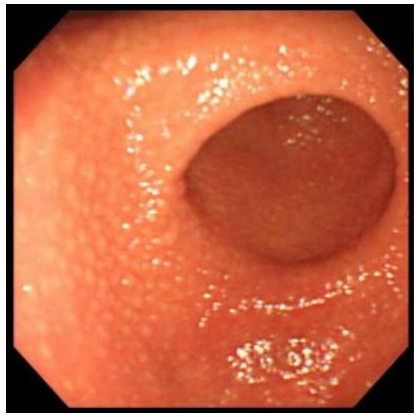

RAC

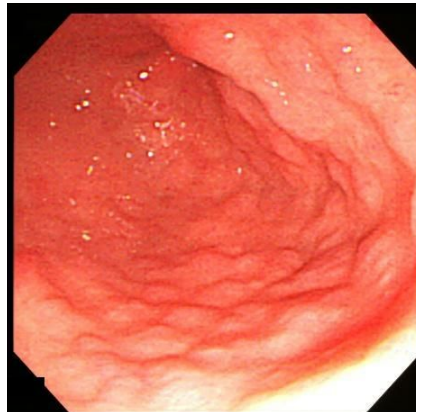

Atrophy

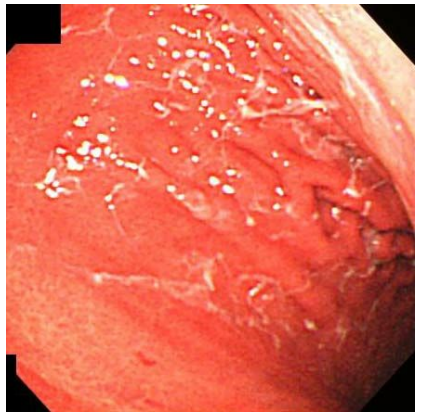

Enlarged folds


Patchy redness


Red streak


Nodularity

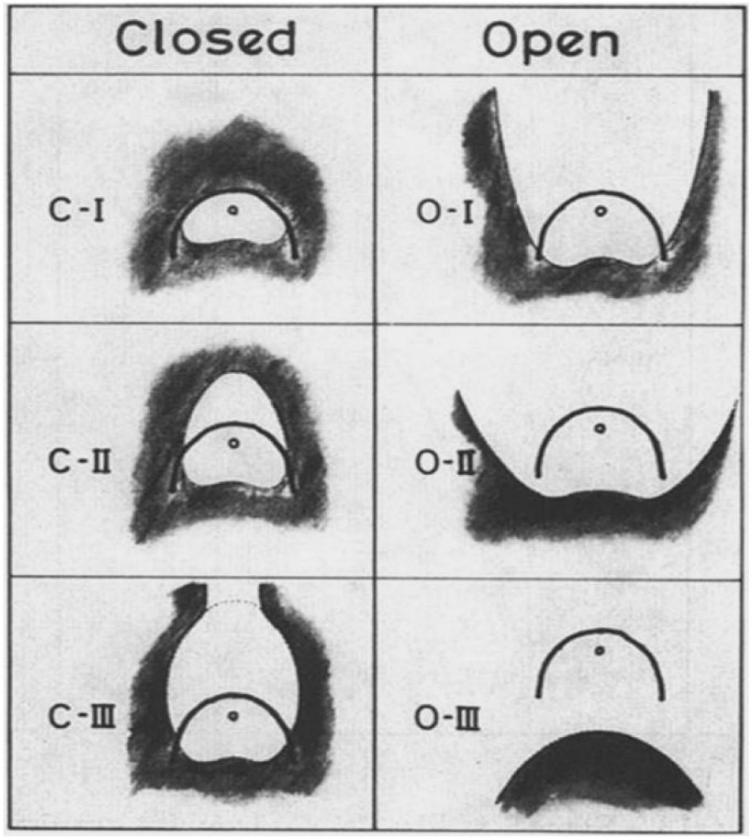

Intestinal metaplasia


Sticky mucus


Map-like redness

Evaluation of the risk of future gastric cancer development based on the atrophic change of gastric mucosa by endoscopy.

Kimura Takemoto Classification to evaluate mucosal atrophy of gastric mucosa.

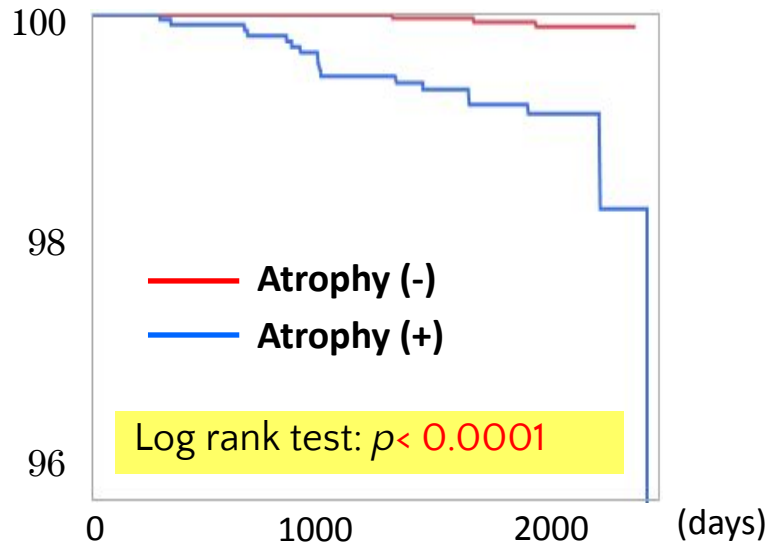


Kimura K, Takemoto T. *Endoscopy* 3:87, 1969

The presence of atrophy (especially from C-II to O-III) mostly reflects the present or past infection of *H. pylori*.

Prospective 7-year follow-up of generally healthy people focusing on the presence of gastric atrophy and gastric cancer development.

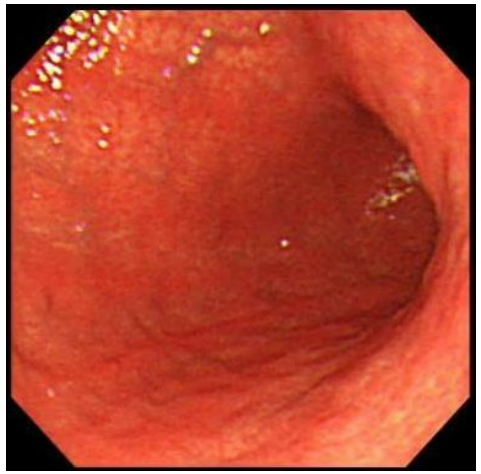
	Gastric cancer (+)	Gastric cancer (-)
Atrophy (-)	2	4275
Atrophy (+)	19	2430



Mucosal atrophy of stomach diagnosed by endoscopy is useful to predict gastric cancer development in the future.

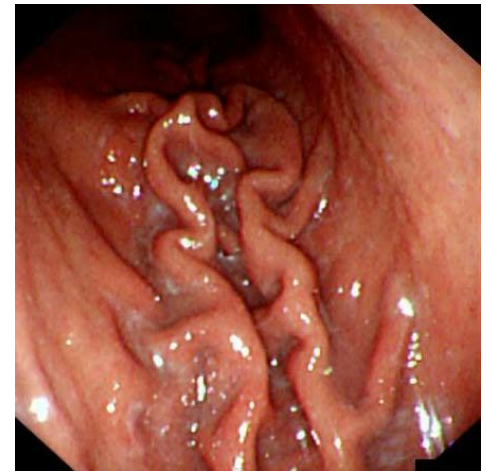
(Takahashi Y, Yamamichi N, et al : in preparation)

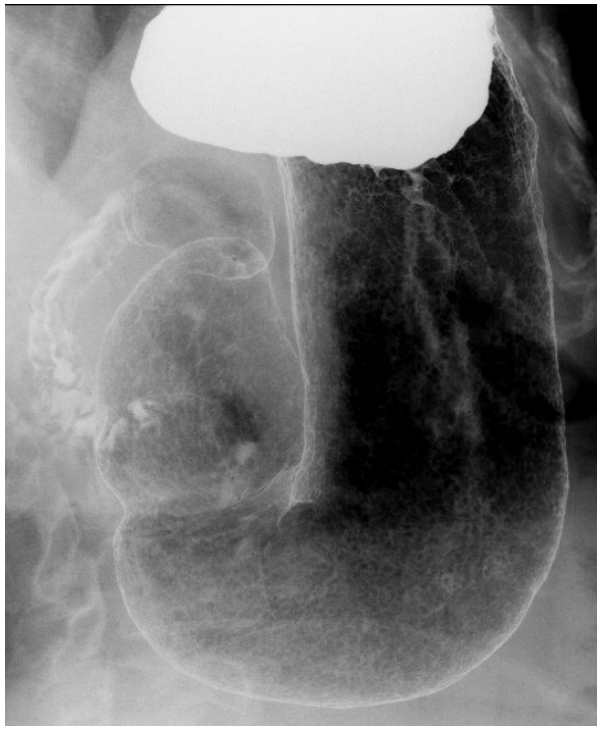
Risk stratification of gastric cancer development based on the evaluation of gastric mucosa by barium X-ray examination.



Mucosal Atrophy

Enlarged Folds



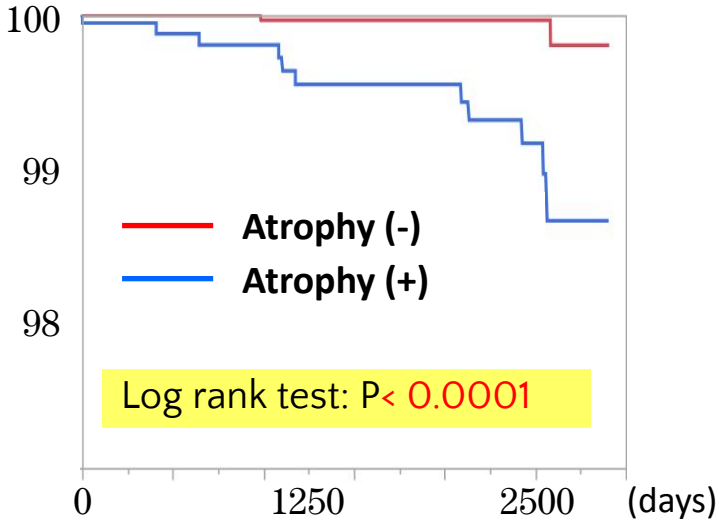


Predicting the risk of gastric cancer development based on the mucosal atrophy and enlarged folds of stomach by barium X-ray.

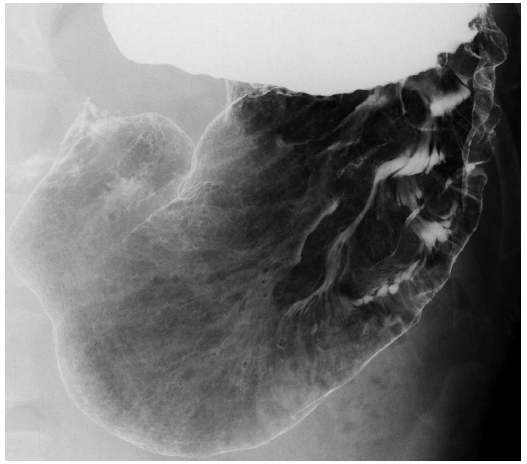
Mucosal atrophy

Prospective 7-year follow-up of generally healthy people

	Gastric cancer (+)	Gastric cancer (-)
Atrophy (-)	2	4495
Atrophy (+)	11	1925

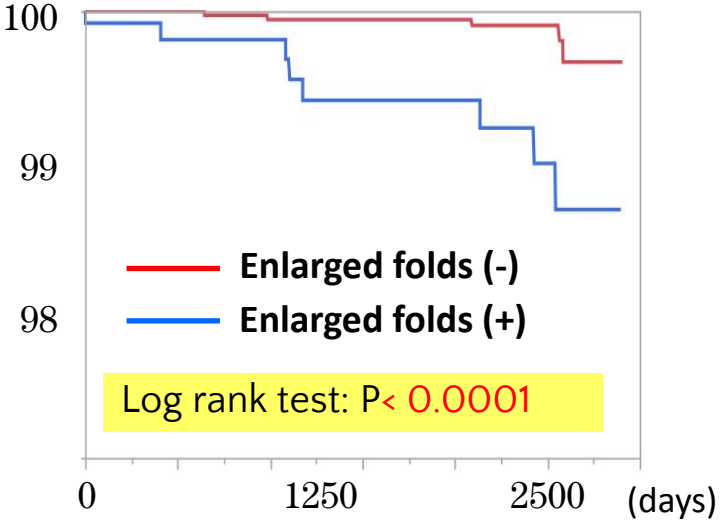


Enlarged folds



Prospective 7-year follow-up of generally healthy people

	Gastric cancer (+)	Gastric cancer (-)
Enlarged folds (-)	5	5175
Enlarged folds (+)	8	1245



Both mucosal atrophy and enlarged folds of stomach diagnosed by barium X-ray are useful to predict the risk of gastric cancer.

(Yamamichi N *et al. Gastric Cancer.* 2016; 19: 1016-22)

Conclusion

Though the mortality and incidence of gastric cancer is decreasing nationwide, it is still the 2nd common malignancy and the 3rd leading cause of cancer deaths in Japan.

At present, only barium X-ray and upper gastrointestinal endoscopy are the officially recommended methods for population-based gastric cancer screening in Japan.

Infection of *H. pylori* is a definitive risk factor for gastric cancer. The prevalence of *H. pylori* infection has been obviously decreasing not only in Japan but worldwide.

Reduced infection rate of *H. pylori* has changed the strategy against gastric cancer in Japan. The concept of stratifying the risk of gastric cancer based on the infection status of *H. pylori* (current, past, and non) has been widely spread in Japan.

I appreciate the attention you paid to my speech