

## HER2-positive stomach cancer – Fast Facts

### Stomach cancer

- Stomach cancer (also known as gastric cancer) is the second most common cause of cancer-related death in the world – killing around 800,000 people each year, yet it is only the fourth most commonly diagnosed cancer – around one million people are diagnosed each year<sup>i</sup>
- The incidence of stomach cancer varies hugely geographically, with a much bigger prevalence in Eastern countries than in the West, and between men and women with men more prone to stomach cancer than women<sup>i</sup>

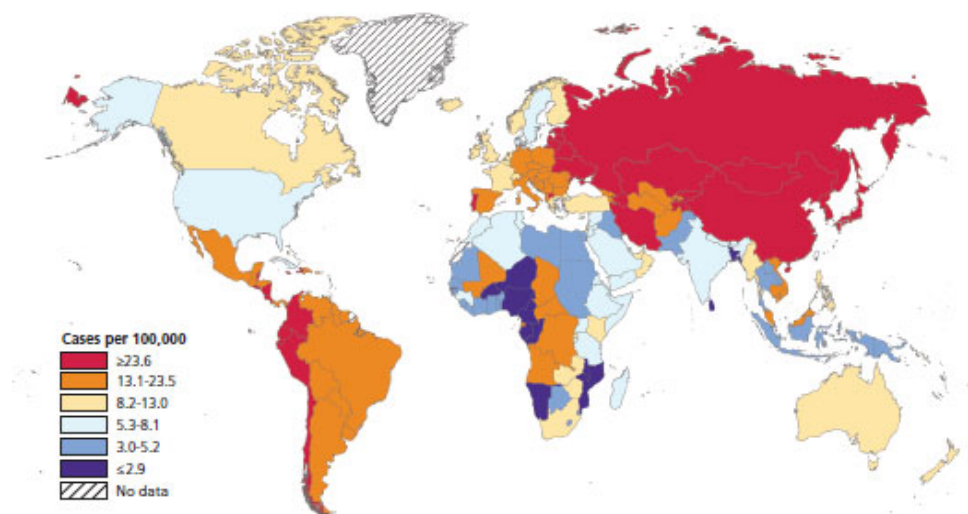


Figure 1: International variation in age-standardized stomach cancer incidence rates among males<sup>i</sup>

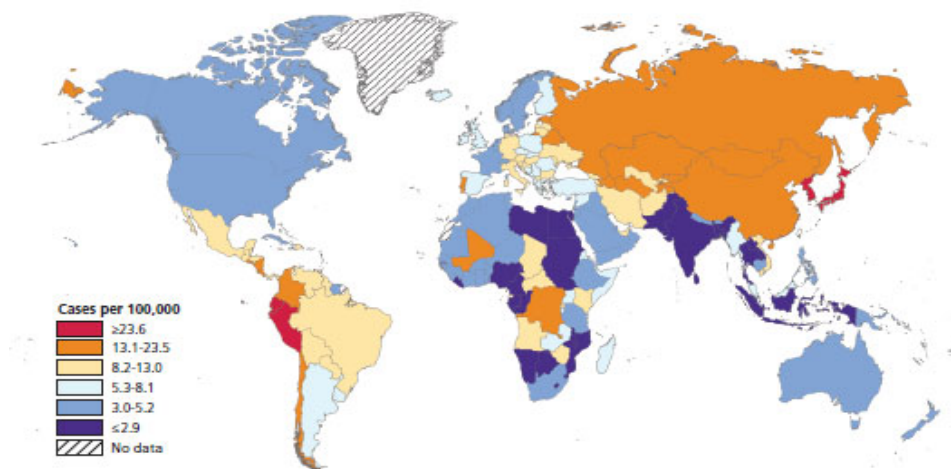


Figure 2: International variation in age-standardized stomach cancer incidence rates among females<sup>i</sup>

- Worldwide, approximately half the cases of stomach cancer are diagnosed in the early stages and half in the advanced setting. Extensive screening programmes are in place in Eastern countries, where screening for early stomach cancer is effective<sup>ii</sup>
- Typical symptoms in later stages of the disease include: indigestion, acidity, burping, feeling full, weight loss and loss of appetite, pain, nausea, difficulty swallowing, anaemia and blood in the stools<sup>iii</sup>
- Factors increasing the risk of stomach cancer include:<sup>iv,v</sup>
  - Gender. Men are more likely to develop stomach cancer
  - Age. Incidence of stomach cancer increases with age
  - About 59% of cases in developing countries and 63% of cases in developed countries are attributable to a bacterial infection with *Helicobacter pylori*<sup>i</sup>
  - Medical conditions such as Barrett's oesophagus, pernicious anaemia and blood group A
  - High intake of salty foods and preserved meat
  - Smoking
  - Obesity
  - Environment / socio-economic deprivation
  - Genetic and familial risk factors
- A diet high in fresh fruit and vegetables, and vitamin C in particular, may help to prevent damage to the stomach lining which can promote stomach cancer<sup>vi</sup>

- Several types of tests are used in the diagnosis of stomach cancer. The three main methods are:
  - [Endoscopy](#) – this is where a long tube with a tiny light and camera is swallowed so that it can enter the stomach and small bowel to allow the clinician to investigate any abnormalities
  - [Barium swallow](#) or barium meal – this is where a white liquid (barium meal) is given to the patient to be swallowed. This liquid shows up on X-ray, so once swallowed, the doctor can watch the barium on the X-ray screen as it passes through the stomach

### Current treatment options and outlook for patients

- Treatment of stomach cancer depends on several factors including the size, location and extent of the tumour, the stage of disease, the patient's age and overall health
- Current treatment options include surgery, chemotherapy and palliative care. Surgery is the only curative therapy for stomach cancer<sup>vii</sup>
- In advanced stages chemotherapy is in most cases the only treatment option associated with a poor average survival of around 10-11 months<sup>viii</sup>

### HER2-positive stomach cancer

- Human epidermal growth receptor 2 (HER2) is a protein found on the surface of a cell which, when present in more than the usual amounts (called HER2 overexpression), aggressively triggers abnormal tumour growth and the fast development of metastases<sup>ix</sup>
- Between 15 and 18% of stomach tumours show high levels of HER2 (termed HER2-positive stomach cancer)<sup>x,xi</sup>
- Methodologies for determining HER2 status: Immunohistochemistry (IHC) assesses HER2 overexpression and In Situ Hybridisation (ISH) determines HER2 gene amplification

### HER2 testing in stomach cancer

- HER2 testing at first diagnosis will be crucial to ensure appropriate stomach cancer treatment. Validated methods and scoring systems to ascertain HER2 status in breast cancer are well established and recent evidence has shown that these same techniques, with some minor modifications (i.e. scoring and

staining), allow reliable identification of patients who can derive life-prolonging benefits from appropriate treatment<sup>x</sup>

- There are [two main methodologies](#) used for determining HER2 status:
  1. Immunohistochemistry (IHC) can show how much of the HER2 protein is present in the tumour sample
  2. In-situ hybridization methods (FISH, CISH, SISH) measures the amount of the HER2 gene in tumour cells

#### References

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<sup>ii</sup> Parkin DM et al. Global Cancer Statistics, 2002. *CA: A Cancer Journal for Clinicians* 2005;55:74-108

<sup>iii</sup> Cancer Research UK. Stomach cancer symptoms. <http://www.cancerhelp.org.uk/help/default.asp?page=3897> Last accessed 26 February 2009

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<sup>vi</sup> Block G. Vitamin C and cancer prevention: the epidemiologic evidence. *American Journal of Clinical Nutrition* 1991;53:270S-282S

<sup>vii</sup> Roth A. Curative treatment of gastric cancer: towards a multidisciplinary approach? *Critical Reviews in Oncology/Hematology* 2003;46:59-100

<sup>viii</sup> Matias KP. Gastric Cancer Studies Focus on Prolonging Survival and Finding Molecular Markers for Targeted Therapies *OncoLog* 2004 <http://www2.mdanderson.org/depts/oncolog/articles/pf/04/4-apr/4-041-pf.html> Last accessed 26 February 2009

<sup>ix</sup> Carter P. et al. Humanization of an anti-p185<sup>HER2</sup> antibody for human cancer therapy. *Proc Natl Acad Sci USA* 1992;89:4285-4289

<sup>x</sup> Hofmann, M et al. Assessment of a HER2 scoring system for gastric cancer: results from a validation study. *Histopathology* 2008;52:797-805

<sup>xi</sup> Park DI, Yun JW, Park JH, Oh SJ, Kim HJ, Cho YK et al. HER-2/neu amplification is an independent prognostic factor in gastric cancer. *Dig Dis Sci* 2006; 51(8):1371-1379.