The State of Cancer Control in Australia 1987-2007:
Changes in cancer incidence and mortality
Cancer Council NSW
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Authors
Eleonora Feletto
Alison Gibberd
Clare Kahn
Katie Armstrong
Karen Canfell
May Chiew
Paul Grogan
Carolyn Nickson
Dianne O’Connell
Andrew Penman
Monica Robotin
David P Smith
Megan A Smith
Rajah Supramaniam
Louiza Velentzis
Marianne Weber
Xue Qin Yu
Freddy Sitas

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In this section, eight cancer types are outlined briefly as a way of contextualising the analysis and highlighting cancer types that are important in Australia – either because of their public health programs or because of large incidence or mortality percentage changes – to illustrate how policy, programs or other changes may have affected these measures. These have been selected based on a combined list of the top five cancer sites for males and females in incidence and mortality according to IARC GLOBOCAN 2008 working estimates, and cancer types of national importance in Australia.\(^5\)

Firstly, trends in incidence and mortality for the cancer type are described – including data from the IARC GLOBOCAN project to illustrate global incidence and mortality working estimates for 2008 in individuals aged 74 years and under. Additionally, the most current survival data available for Australia from the AIHW are also provided.\(^3\) The AIHW survival data are presented to provide context rather than to facilitate a comparison between survival trends and our findings. However, the AIHW data were only available for all ages combined. The relative survival and five-year conditional relative survival data reported by the AIHW show the probability of surviving a given number of years, provided that an individual has already survived a specific amount of time after diagnosis.\(^3\)

A brief overview of current prevention strategies, screening programs and treatment methods in use globally and in Australia are also provided. The results of our analysis for the specific cancer type are then presented and discussed.

References


7.8 Stomach cancer (C16)

7.8.1 Background

Stomach cancer, or gastric cancer, is the fourth most common cancer globally with an estimate of new cases just short of 1 million in 2008. IARC GLOBOCAN 2008 working estimates reported the incidence for stomach cancer was 16.2/100,000 in males under 75 and 7.3/100,000 in females in the same cohort. Large variations in incidence and mortality are apparent between regions across the globe, with concentrations in Eastern Asia and Latin America. Recent trends have shown a decline in incidence in Western countries. Risk is reduced for immigrants moving from a high-risk country to a low-risk country, where they acquire the risk of the host nation within a generation of migration. Approximately 70% of new cases are found in developing countries, and the highest mortality rate was for Eastern Asia and the lowest in Northern America. The global mortality rates for individuals aged under 75 years of age are 11/100,000 in males and 5.2/100,000 in females.

The prognosis for stomach cancer is generally poor, as patients are often diagnosed late and at quite an advanced stage. Stomach cancer is largely asymptomatic, or associated with non-specific symptoms, which is the reason for its late presentation and poor prognosis. Beginning with precancerous lesions and often a progression from chronic gastritis, stomach cancers can largely be divided into subtypes. Cancers of the gastric cardia (the area of the stomach attached to the oesophagus), fundus and body of the stomach are referred to as proximal gastric cancers. Distal gastric cancers are found in the remaining two sections of the stomach. Stomach cancers are also often divided into cardia or non-cardia groupings, as incidence rates for these two groups vary significantly, with larger increases in incidence in industrialised countries. Distal gastric cancer is more prevalent in developing countries and in lower socioeconomic populations, whereas proximal tumours are common in developed countries. In contrast to this trend, there is a high prevalence of distal gastric cancer in Japan.

In Australia, twice as many males are affected by stomach cancer than females. This is thought to result from environmental factors, with differing diets and poorer refrigeration of food products, but the relative importance of these factors is unknown. Relative survival is initially poor, with a 27% probability of surviving for at least 5 years at diagnosis. The 5-year conditional relative survival increases to 51% at 1 year. At 15 years after diagnosis, conditional survival jumps to 100%. Survival rates are higher for patients in major cities and decrease as SES decreases.
7.8.1.1 Causes and risk factors

Stomach cancer is largely attributed to environmental causes.\textsuperscript{7, 50} It is more commonly diagnosed in individuals between the ages of 50 and 70 and is not common in individuals under 30 years of age, making age a risk factor.\textsuperscript{50} Overall, stomach cancer is more common in males, especially for the cardia subtype.\textsuperscript{50} For obvious reasons, diet has been associated with stomach cancer: specific dietary patterns are associated with distal tumours whereas obesity is commonly associated with proximal tumours.\textsuperscript{52} Infection with H. pylori, officially listed by IARC as a carcinogen in 1994\textsuperscript{7}, can cause inflammation of the gastric mucosa and is the main risk factor of stomach cancer; however, only a small proportion of people with H. pylori will develop cancer.\textsuperscript{51-53}

It has been suggested that a diet high in fruit and protein-quality and non-starchy vegetables can lower the risk of stomach cancer.\textsuperscript{7, 52, 363} The World Cancer Research Fund found probable evidence to support the decrease in stomach cancer risk with the specific consumption of non-starchy vegetables, allium vegetables and fruits.\textsuperscript{36} On the other hand, there is probable evidence associating salt and consumption of salted or salty foods with increased risk of stomach cancer.\textsuperscript{36, 364, 365}

Evidence of risk associated with other food and nutritional factors was not conclusive, according to the World Cancer Research Fund's report.\textsuperscript{36}

A recent meta-analysis has suggested that the consumption of cruciferous vegetables has an inverse association with risk of gastric cancer.\textsuperscript{366} Following a Mediterranean diet has been associated with a significant reduction in stomach cancer incidence.\textsuperscript{367} This association was not as strong for individual components of the diet: the overall diet had stronger protective effect, often associated with the higher proportion of plant-based rather than animal-based products.\textsuperscript{367}

The bacterium H. pylori is present in the stomach appears to be transmitted by saliva or faecal contamination.\textsuperscript{205, 368} All infected will develop gastritis.\textsuperscript{368} H. pylori infection has been shown to have causal relationship with non-cardia gastric cancer.\textsuperscript{7, 52} Although this is the strongest risk factor, only a small proportion of individuals with H. pylori will develop gastric cancer.\textsuperscript{365, 368} H. pylori is most prevalent in developing countries and is often acquired during childhood and present through to adulthood, but can be cured with antibiotics.\textsuperscript{7, 369} An increase in incidence of stomach cancer has been associated with the Epstein-Barr virus but the evidence is not conclusive, and the reason for the association has not been clearly established.\textsuperscript{53, 213, 365, 370}

In conjunction with specific dietary elements, cooking practices including broiling of meat, roasting, grilling, baking, deep frying in open furnaces, sun drying, salting, curing and pickling can increase the formation of N-nitroso compounds which can increase the risk of stomach cancer.\textsuperscript{36, 52} However, the evidence supporting this is limited.\textsuperscript{36} Excessive consumption of salted fish, pickled vegetables, cured meats and soy sauce can promote the development of Helicobacter pylori (H. pylori) that causes damage in the gastric mucosa, thus increasing risk.\textsuperscript{50, 54}

Additional lifestyle influences on stomach cancer include the consumption of alcohol and tobacco.\textsuperscript{52, 55, 56} Alcohol is an irritant on the stomach and regular consumption could increase the risk of stomach cancer.\textsuperscript{52, 371} The interaction between alcohol consumption and stomach cancer, while biologically plausible, is confounded by dietary factors and smoking.\textsuperscript{371, 372} A pooled analysis has shown that there is no association between moderate alcohol consumption and increased risk of stomach cancer; however, when consumption is heavy (four or more drinks per day), the risk of stomach cancer is significantly increased, especially in non-cardia tumours.\textsuperscript{371} Conclusive evidence has not been found to support this association in some cultural groups, such as the Japanese population.\textsuperscript{372}

Tobacco smoke is associated with increased likelihood of precancerous lesions and damage of the gastric mucosa leading to stomach cancer.\textsuperscript{52, 57} The interaction between alcohol consumption and stomach cancer, while biologically plausible, is confounded by dietary factors and smoking.\textsuperscript{371, 372} A meta-analysis showed that the risk of stomach cancer is 60% higher in male smokers and 20% higher in female smokers compared to never smokers, with similar but not as strong relationships for current and former smokers.\textsuperscript{374} A cohort study of ethnic minority groups in the USA showed similar results; however, only male former smokers were at higher risk than never smokers.\textsuperscript{375} Nomura et al.'s\textsuperscript{375} findings suggested there was a higher incidence of cancer of the cardia in ever smokers than distal gastric cancers in the cohort. Other cohort studies have shown similar results.\textsuperscript{373}
Evidence suggests that there may be some genetic influence on stomach cancer incidence.\textsuperscript{7, 50, 360} History of stomach cancer in first-degree relatives can double or triple the risk, depending on the number of relatives with the disease.\textsuperscript{362, 376} Approximately 10% of cases are hereditary.\textsuperscript{52} Because family members often share the same environments, hereditary cases of stomach cancer are also influenced by similar environmental risk factors in addition to genetic disposition.\textsuperscript{50, 52} The protective effect of aspirin against non-cardia gastric cancer, especially for individuals infected with H. pylori, has been suggested.\textsuperscript{377} Sufficient evidence also exists linking heavy long-term asbestos exposure, X- and y-radiation exposure or working in rubber manufacturing to stomach cancer.\textsuperscript{53, 177, 212}

7.8.1.2 International prevention/ screening/treatment programs

Prevention strategies are the best hope of continuing the trend of declining incidence and mortality associated with stomach cancer.\textsuperscript{369} Prevention initiatives for stomach cancer revolve around dietary controls and reducing the possibility of H. pylori infection.\textsuperscript{7, 364} Promoting positive dietary habits could reduce the burden of stomach cancer by approximately 50%.\textsuperscript{54, 57} Healthy living and eating campaigns work towards reducing associated risk factors.\textsuperscript{52} For stomach cancer, this also includes modified cooking practices and correct refrigeration of food items.\textsuperscript{52, 369} Clean water, sanitation and good hygiene are believed to limit the spread of H. pylori infection. Prevention of H. pylori is more effective if targeted at young individuals, before the infection has the opportunity to develop.\textsuperscript{364}

As a significant cause of stomach cancer, screening of H. pylori would be a simple test that could be of benefit despite the declining prevalence of bacterial infection in some countries.\textsuperscript{378, 379} Modelling simulations in the UK suggest a long-term benefit from a once-off test at age 40.\textsuperscript{378} Screening for stomach cancer involves imaging and endoscopy with a biopsy. Nationwide screening is not essential in all nations; however, in Korea and Japan, where incidence and mortality are high, mass-screening programs have been implemented as cost-effective ways of improving survival rates.\textsuperscript{360} No randomised trials have been conducted to objectively evaluate the efficacy of screening for stomach cancer to date.\textsuperscript{362} Use of the endoscopy screening method outside of Japan may not prove to be cost effective or practical, so a more appropriate method could be researched.\textsuperscript{360} The radiolabelled urea breath test, which is used to diagnose H. pylori, has been trialled and proposed as a potential mass-screening method for stomach cancer.\textsuperscript{360}

Very small tumours can be treated using an endoscopy; otherwise, the gold standard treatment for stomach cancer is a total or subtotal gastrectomy.\textsuperscript{360, 381} Radiotherapy and chemotherapy in advanced cases of stomach cancer are limited in their usefulness because of poor survival prognoses.\textsuperscript{52} However, adjuvant therapies used to treat recurrence can be of some benefit to survival.\textsuperscript{360, 361} Adjuvant chemotherapy can improve survival when compared to best supportive care.\textsuperscript{381} Combined agent use, rather than single agent, is largely used in Western countries and proven to be statistically more effective, but is not widely used as standard treatment in countries such as Japan.\textsuperscript{381} The role of radiotherapy in treatment is considered controversial in its clinical benefit, but was shown to have a significant impact on five-year survival.\textsuperscript{361} Treatment of non-curative patients has not shown evidence of improvements in survival or mortality rates.\textsuperscript{382} Often surgery is undertaken in this patient group to relieve specific obstructions or to ease suffering, but these procedures often have poor outcomes.\textsuperscript{382}

7.8.2 Incidence and mortality rates in Australia 1987–2007

Incidence and mortality dropped in both males and females over two decades (Figure 7–15 and Figure 7–16). There has been a 50% decrease in mortality and a 34% decrease in incidence over this time period, both of which are statistically significant (Table 7–15 and Table 7–16). The observed falls in mortality and incidence reflect improvements in living standards from the 1920s, when the prevalence of H. pylori began to decline.\textsuperscript{7} There is some evidence of lower prevalence of H. pylori in younger adult groups,\textsuperscript{383} suggesting further reductions in stomach cancer may occur in the future.
Considering the low survival rates of stomach cancer initially, quality of life has been compared for various treatment types to assess the impact of necessary and unnecessary treatments.\textsuperscript{360} In a group having undergone a subtotal or total gastrectomy, quality of life was significantly reduced after surgery and took approximately six months to stabilise.\textsuperscript{384} Total gastrectomy patients had lower quality-of-life scores than those who having undergone a subtotal gastrectomy, up to 12 months after surgery.\textsuperscript{385} In comparing the laparoscopy-assisted distal gastrectomy with open distal subtotal gastrectomy, it was found that although the former is preferred because of reduced pain and faster recovery in the individual, the quality of life associated with a laparoscopy-assisted distal gastrectomy was lower up to five years after treatment.\textsuperscript{386}

Current public health initiatives run by the Australian Government aimed at reducing tobacco and alcohol consumption and promoting healthy eating practices address many of the environmental factors that can increase the incidence of stomach cancer. Although analyses of stomach cancer trends in areas of Australia have suggested lower risk for Australian-born individuals compared to other nations,\textsuperscript{39} specific groups, including immigrants from high-prevalence countries, present a more immediate issue for policymakers.
7.8 Stomach Cancer (C16)

References


