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queensland cancer control analysis team

Book of abstracts

2008-2012

Queensland Cancer Control Analysis Team
Queensland Health

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This compendium collects abstracts submitted to and accepted for oral or poster presentation at the Clinical Oncology Society of Australia (COSA) Annual Scientific Meetings and the biannual Australian Lung Cancer Conference (ALCC) between 2008 and 2012. All abstracts have been peer-reviewed and published in their respective conference proceedings.

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Melanoma rates continue to increase in the elderly

An analysis of Queensland melanoma incidence rates up to 2009

COSA 2012 Poster

Melanoma incidence rates are increasing in older Queenslanders despite two decades of skin cancer prevention campaigns started in the 1980s.

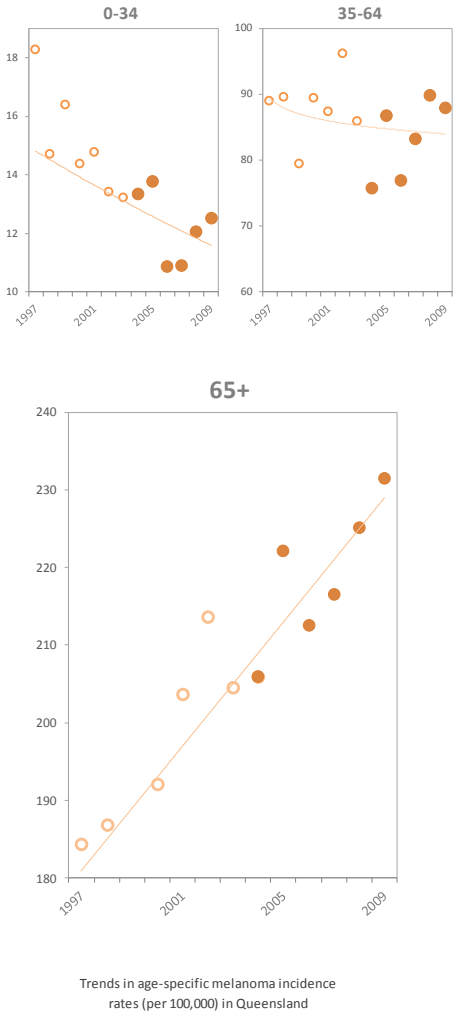
Queensland has the highest rate of melanoma in the world; 1 in 16 Queenslanders are diagnosed with melanoma before the age of 80. While the overall rate has not changed in recent years, the trend varies with age.

Queensland melanoma rates from 1990 to 2009 show three distinct age-related patterns:

- In people below 35, the rate peaked in the late 1990s, but declined steadily since then by around 4% per annum to levels similar to those in the 1980s
- In 35-64 year olds, the rate peaked at the end of the 1990s and has remained largely unchanged over the past decade.
- In people aged 65 and over, the rate increased by 2% per annum over the entire period, from 152 per 100,000 in 1990 to 231 per 100,000 in 2009.

The rising rate of melanoma in older Queenslanders may be a delayed effect of sun exposure prior to the prevention campaigns launched in the 1980s. Given the estimated lag of 10-40 years between exposure and melanoma occurrence, this trend is likely to continue over the next decade.

The increase in melanoma frequency in older people may, however, partly reflect resistance to preventive measures in those who are more susceptible to the disease. Care must be taken that the trend is not attributed indiscriminately to long latency and dismissed as inevitable for everyone in this age group.



Trends in age-specific melanoma incidence rates (per 100,000) in Queensland

Melanoma thickness and frequency of nodular melanoma are more strongly related to socioeconomic disadvantage in men than in women

COSA 2012 Shortlisted Best of the Best Orals

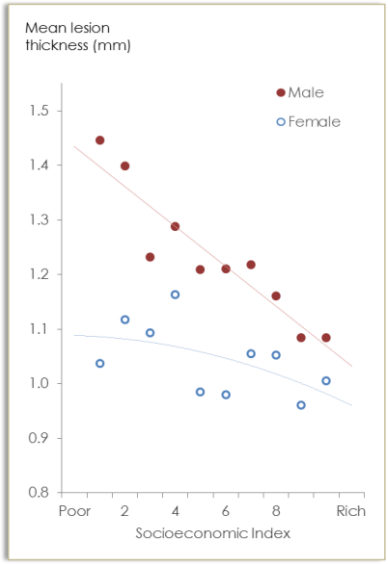
Melanoma patients from poorer socio-economic backgrounds present with thicker lesions. Nodular melanoma, the most aggressive type of melanoma, is also more common in socioeconomically disadvantaged areas.

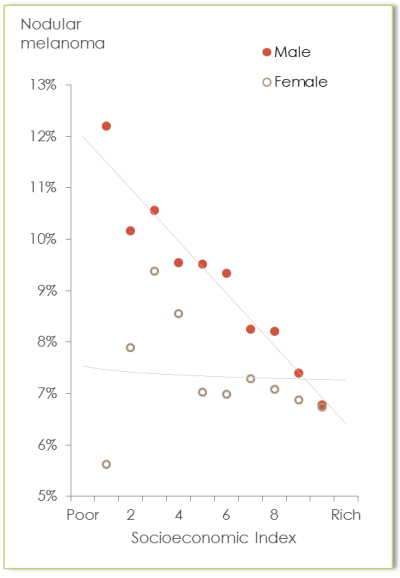
A population-based retrospective analysis was performed on 35,640 adult melanoma cases notified to the Queensland cancer registry between 1995 and 2009. Patients were divided into deciles of socioeconomic status (SES) based on 2006 census data. Melanoma thickness and the likelihood of nodular melanoma diagnosis were regressed against SES decile controlling for age and stratified by sex.

There is a significant linear trend between melanoma thickness and decreasing socioeconomic status in men, with lesions becoming 0.020 mm thicker with every unit drop in SES decile (95% confidence interval [CI] 0.01-0.03, $p < 0.001$). The trend is much weaker in women (0.005 mm, CI -0.02-0.02, $p = 0.325$).

Similarly, the frequency of nodular melanoma increased with decreasing socioeconomic index in men (relative risk ratio [RRR] 1.05 per SES decile drop, CI 1.03-1.07, $p < 0.001$) but only slightly in women (RRR 1.02, CI 0.99-1.04, $p = 0.139$).

Nodular melanoma rates do not account for the relationship between lesion thickness and SES in men, however, as the association remains even when all nodular melanomas are excluded (0.021 mm, CI 0.01-0.03, $p < 0.001$). The trends suggest that men from the lowest SES decile present with 18% thicker lesions and 1.6 times higher rate of nodular melanoma than men from the highest SES decile.





Men from socioeconomically disadvantaged areas have the highest risk of developing the most invasive form of melanoma, and even those with less aggressive forms tend to present with thicker lesions. Melanoma prevention measures and initiatives could have immediate outcomes if targeted at this group.

Geographic variation in colorectal cancer survival in Queensland persists even after multivariate adjustment for morbidity and treatment

COSA 2010 Shortlisted Best of the Best Poster

Colorectal cancer survival is poorer in rural compared to urban areas of Queensland even when differences in patient morbidity and surgical treatment are accounted for.

We analysed the 2-year cancer-specific survival of 19,772 Queensland residents diagnosed with colorectal cancer between 2000 and 2007. The risk of mortality across eight regions was estimated through multivariate analysis controlling for demographics, cancer stage, comorbidity, surgery, and acuity of care.

The 2-year cancer-specific survival rate ranged from 70% in one rural region to 78% in the capital. Cancer stage, comorbidity, surgery, and acuity of care were all independent predictors of mortality, but there were no marked geographic differences in these factors and adjustment for them did not alter the trend towards lower survival in the more remote areas. With the capital region (region A) as the baseline, the adjusted relative risks of 2-year mortality were 1.35 (95% confidence interval [CI] 1.15-1.58), 1.47 (CI 1.28-1.69), and 1.22 (CI 1.07-1.39) in the three farthest regions which together make up 14% of the total number of patients.

Differences in patient morbidity and surgical treatment do not explain the poorer outcome of colorectal cancer patients in remote areas of Queensland.

Risk of death within 2 years of colorectal cancer diagnosis according to distance of residence from the capital region (region A); values are hazard ratios (HR) from a crude (hollow markers) and adjusted (solid markers) Cox proportional hazards regression model.

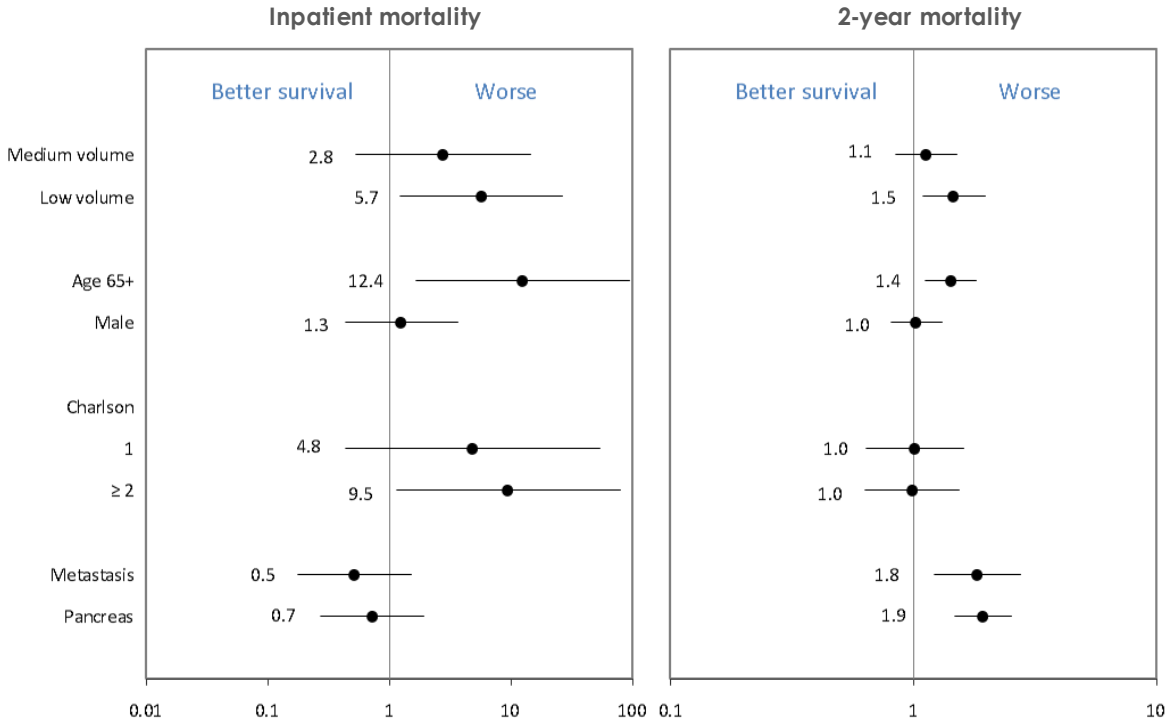
Pancreaticoduodenectomy (Whipple procedure) survival is worse in low volume hospitals

COSA 2010 Poster

There is an association between hospital volume and mortality for pancreaticoduodenectomy (Whipple procedure), a complex operation to remove cancer of the pancreas and adjacent sites. Patients at low volume hospitals face greater risk of death after the procedure.

Four hundred ten patients who underwent Whipple surgery at 24 hospitals in Queensland from 2000 to 2007 were divided into three groups according to the annual procedure volume of the hospital: low (< 3), medium (3 to 6), and high (> 6). Inpatient mortality and 2-year survival rates were compared across hospital volume groups using a multivariable Cox proportional hazards regression model adjusted for comorbidity and other characteristics.

The inpatient mortality rate after Whipple surgery was 8.1%, 3.1%, and 1.4% in low, medium, and high volume hospitals respectively. Relative to high volume hospitals, the risk of inpatient death was 5.7 times higher (95% CI 1.3-26.2) in low volume hospitals. Among those who did not die in hospital, low volume hospital patients were 1.5 times more likely (95% CI 1.1-2.0) to die within 2 years of their surgery compared to patients at high volume hospitals.



Risk of inpatient and 2-year mortality following Whipple's procedure; values are hazard ratios (HR) from multivariable Cox proportional hazards regression model.

Survival of lung cancer patients with prior malignancies

A population-based study

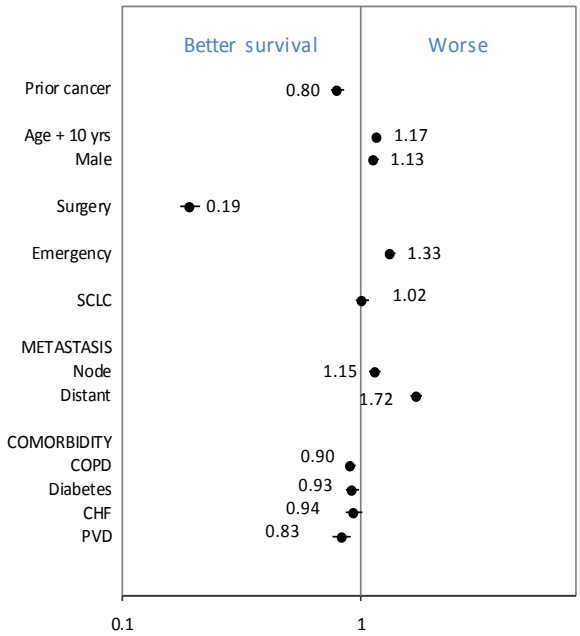
COSA 2010 Shortlisted Best of the Best Orals

Lung cancer patients with prior malignancies have better survival than patients whose lung cancer was the first or index cancer. Screening and surveillance for other cancers may contribute to the earlier detection of lung cancer.

We analysed the cancer-specific 2-year survival of Queensland residents first diagnosed with lung cancer from 2000 to 2007 through multivariate regression controlling for age, sex, histological subtype, metastases, comorbidities, surgery, and acuity of care. Prior malignancies included all invasive cancers registered since 1982.

Of 13,329 lung cancer patients, 2,008 (15%) had prior malignancies. These patients were older but had higher rate of surgery and lower rates of metastatic disease and emergency care. The distribution of prior cancers was similar to that in the general cancer population except for head and neck and bladder cancers which were more common in malignancies preceding lung cancer.

The crude 2-year survival rates were 25% and 23% ($p<0.001$) for patients with and without prior cancers respectively. In multivariate analysis, a prior cancer was associated with a 20% reduction (95% confidence interval 14%-25%) in the risk of lung cancer death.



Relative risk of lung cancer death within 2 years of diagnosis; values are hazard ratios (HR) from multivariable proportional hazards (Cox) regression model.

Lung cancer is detected earlier in patients with prior malignancies

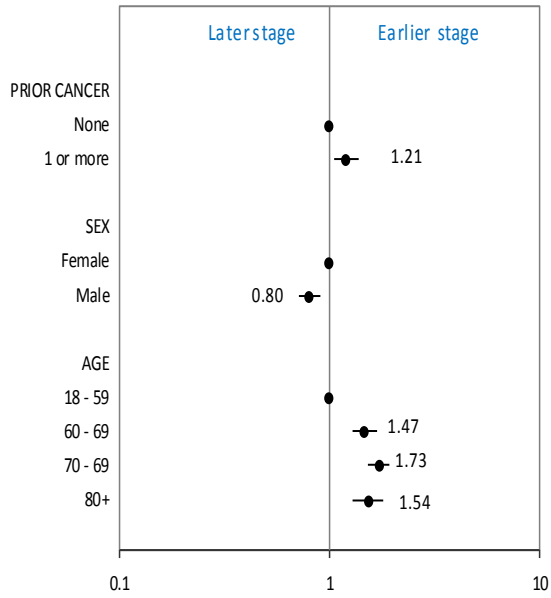
ALCC 2010 Poster

Lung cancer patients with a history of at least one other cancer present with earlier stage than patients whose lung cancer was the first cancer. Surveillance and treatment for other cancers may contribute significantly to the early detection of lung cancer.

We analysed the distribution of clinical stage among patients who were diagnosed with non-small cell lung cancer (NSCLC) between 2000 and 2007 and were managed by multidisciplinary teams participating in the Queensland Integrated Lung Cancer Outcome Project (QILCOP). Prior malignancies included all invasive cancers registered since 1982. The likelihood of presenting with stage I lung cancer was analysed through multivariate logistic regression controlling for age and sex.

4,270 NSCLC patients presented to QILCOP in 2000-2007. Of these, 636 had at least one other primary malignancy before lung cancer. The proportion with stage I cancer was 34% in patients with prior malignancy and 28% in those with no such history (p<0.001).

In multivariate analysis, patients with prior malignancy were 21% more likely (95% confidence interval [CI] 5%-38%) to be diagnosed with stage I cancer. The trend is most pronounced in women with previous history of breast cancer, more than half of whom presented with stage I NSCLC.



Relative probability (risk ratio) of presenting with stage I non-small cell lung cancer

Geographic variation in lung cancer survival in Queensland persists after multivariate adjustment for comorbidity and surgical treatment

ALCC 2010 Oral Presentation

Lung cancer survival is poorer in rural compared to urban areas of Queensland. The disparity remains even when differences in treatment and morbidity are taken into account.

The risk of death within 2 years of lung cancer diagnosis among 13,329 Queensland residents diagnosed between 2000 and 2007 was analysed using multivariable Cox proportional hazards regression adjusted for comorbidity and surgical treatment.

With the capital centre (region A) as the baseline, the crude relative risk (RR) of 2-year mortality was lowest in the two regions closest to the capital – regions B (RR 1.01, 95% confidence interval [CI] 0.97-1.05) and C (RR 0.97, CI 0.94-1.01). The risk was higher in all areas more than 100 km away from the capital, with region F, a centre about 1,000 km from it, having the highest crude mortality risk ratio of 1.16 (CI 1.09-1.22).

Comorbidities, tumour resection, and acuity of care were all significant predictors of mortality, but while their rates varied across regions, adjustment for them did not alter the geographic trend in mortality and increased the risk estimate for region F to 1.32 (CI 1.10-1.56).

Particular attention should be given to one region where the mortality may be high even among those with surgically curable disease.

Risk of death within 2 years of lung cancer diagnosis according to distance of residence from the capital region (region A); values are hazard ratios (HR) from a crude (hollow markers) and adjusted (solid markers) Cox proportional hazards regression model.

Hospital volume-related mortality after gastric cancer surgery

A case for targeted care of elderly patients with comorbid disease

COSA 2009 Winner Best of the Best Poster

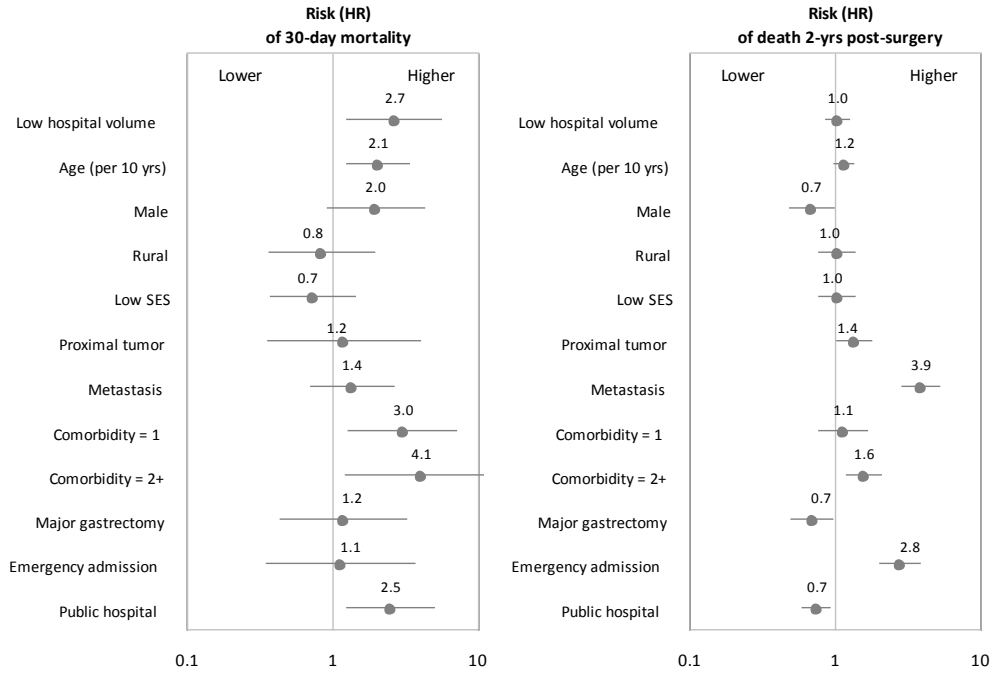
Low hospital volume is associated with higher postoperative mortality for gastric cancer surgery. The targeted care of elderly patients with comorbidity could have a substantial impact on stomach cancer outcomes.

We analysed the 30-day mortality and 2-year survival (excluding postoperative deaths) of 624 patients who were diagnosed with gastric cancer in 2000-2005 and underwent gastrectomy across 42 low-volume (< 5/yr) and 6 high-volume (≥ 5/yr) hospitals. The number of deaths associated with low hospital volume was then estimated and stratified according to risk factors determined from a Cox proportional hazards model adjusted for clinical and demographic characteristics.

The risk of 30-day mortality was higher in low-volume hospitals adjusted hazard ratio [HR] 2.7 (95% confidence interval [CI] 1.2-5.7; P=0.01), but 2-year survival was the same for both volume groups HR 1.0 (CI 0.9-1.3, P=0.66).

Other adverse risk factors for postoperative mortality include older age, comorbidity, and treatment in public hospitals.

Of 30 post-operative deaths, 13 are associated with treatment at low-volume hospitals, 9 of which 69% were elderly patients with comorbid disease, a group that made up only 25% of patients treated at low-volume hospitals.



Risk of inpatient and 2-year mortality following gastrectomy for gastric cancer; values are hazard ratios (HR) from a multivariable Cox proportional hazards regression model.

Survival of colorectal cancer surgery patients in public and private Queensland hospitals

COSA 2009 Winner Best of the Best Poster

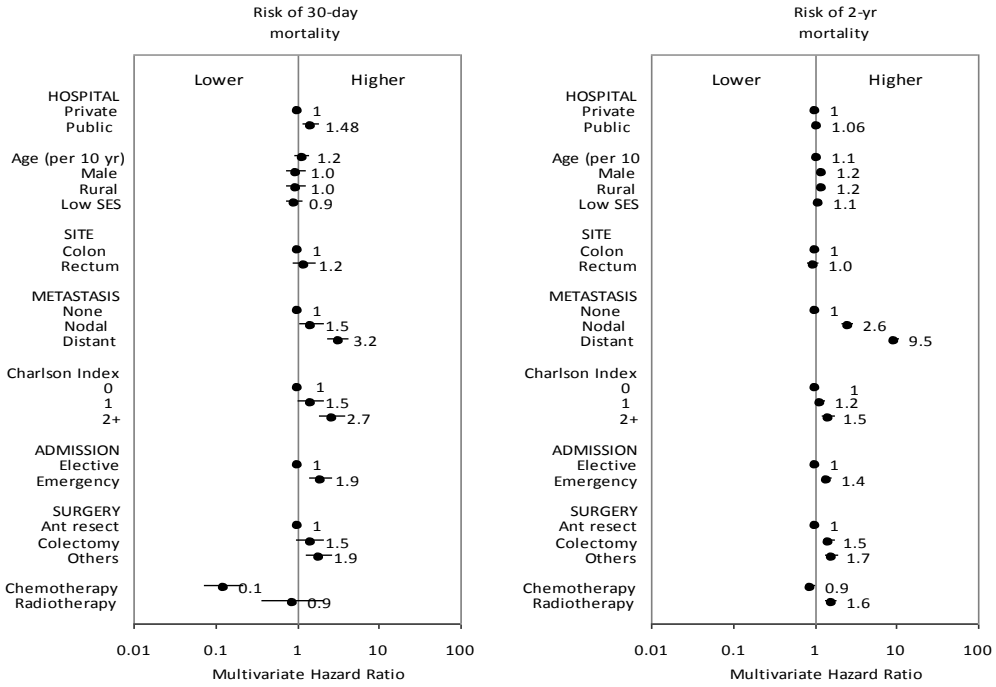
A Western Australia study found that colorectal cancer patients treated in public hospitals had poorer survival than those treated in the private sector. In Queensland, postoperative mortality following colorectal cancer surgery was higher in public compared to private hospitals.

A population-based retrospective analysis was performed on the 30-day mortality and 2-year survival of 4,832 private and 4,555 public patients who had surgery for colorectal cancer diagnosed from 2000 to 2005. Differences in mortality between hospital sectors were analysed through multivariable Cox proportional hazard regression models adjusted for demographic and clinical characteristics.

The overall mortality rate was 3.0% in 30 days and 21.1% in 2 years after colorectal cancer surgery.

Public hospital patients had 48% higher risk (95% CI 17% to 86%) of 30-day mortality than private patients when adjusted for case mix in multivariable regression analysis. The 2-year mortality risk among postoperative survivors was 6% higher (95% CI -2% to 15%) in public compared to private patients.

Other factors associated with worse survival include older age, comorbid disease, metastasis, and emergency admission. Gender, rural residence, socioeconomic status (SES), and procedure volume were weak or non-significant predictors of mortality following surgery.



Risk of 30-day and 2-year mortality following colorectal cancer surgery; values are hazard ratios (HR) from a multivariable Cox proportional hazards regression model.

Socioeconomic status is a prognostic factor for small cell but not for non-small cell lung cancer

COSA 2009 Shortlisted Best of the Best Poster

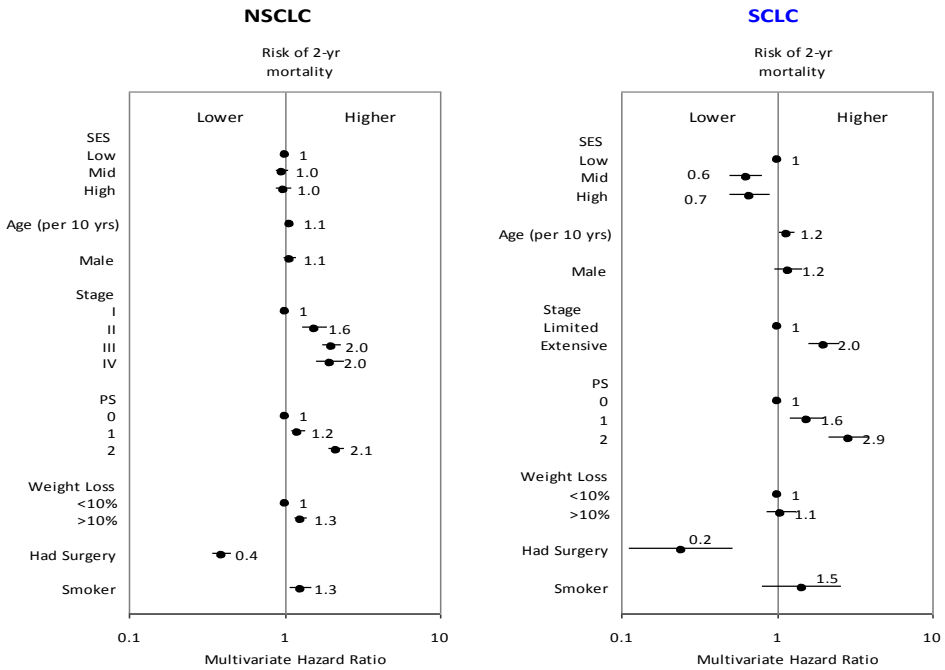
Socioeconomic disadvantage is associated with poorer survival in small cell lung cancer (SCLC), but not in non-small cell lung cancer (NSCLC) patients. Socioeconomic status may have a larger impact on the less common but more acute form of lung cancer.

3,484 NSCLC and 470 SCLC patients diagnosed between 2000 and 2005 were identified through the Queensland Integrated Lung Cancer Outcomes Project (QILCOP), a clinical registry which collects data on 40% of all lung cancer patients in the state.

Three categories of socioeconomic status (SES) – low, middle, and high – were created using census-based indices of income, education, and occupation. Overall 2-year survival was compared across SES groups through multivariable Cox proportional hazards regression controlling for age, gender, clinical stage, performance status (PS), weight loss (over 6-months), smoking history, and surgical treatment.

Socioeconomic status was an independent prognostic factor for 2-year survival in SCLC patients. Compared to patients in the lowest socioeconomic category, the risk of dying within 2 years of SCLC diagnosis was 37% lower (95% confidence interval [CI] 19% to 51%) for middle SES patients and 34% lower (CI 10% to 51%) for high SES patients.

There was no socioeconomic trend in survival among NSCLC patients, the risk of death being only 3% (CI -12 to 7%) and 1% (CI -12% to 10%) lower for middle and high SES respectively.



Risk of death within 2 years of diagnosis of lung cancer; values are hazard ratios (HR) from a multivariable Cox proportional hazards regression model.

Mastectomy remains more common in rural compared to urban Queensland breast cancer patients regardless of tumour size, even in young (<40 year-old) women

COSA 2008 Shortlisted Best of the Best Poster

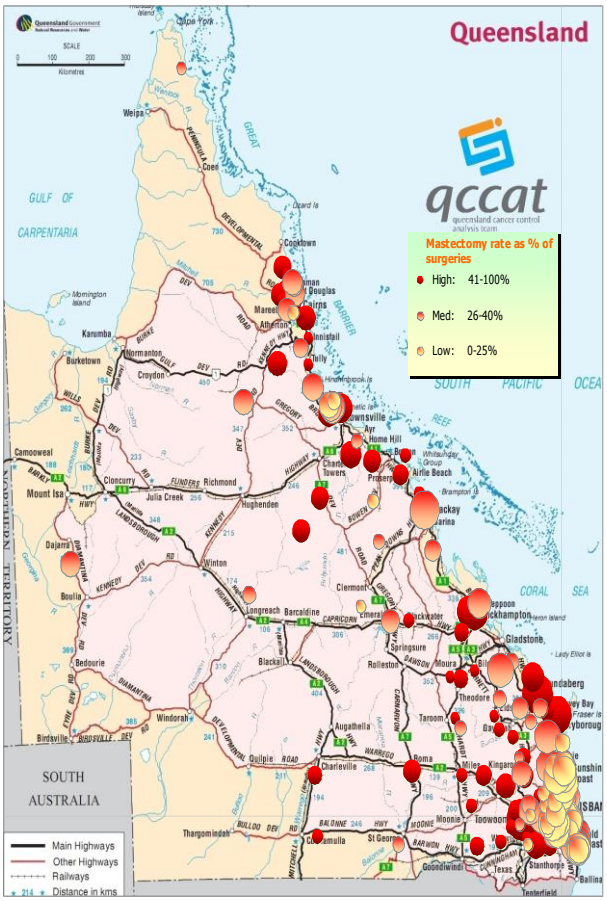
There is a disparity between urban and rural breast cancer surgery practice in Queensland. Mastectomy is more common in rural compared to urban areas regardless of age or tumour size.

We used the Queensland Cancer Registry and the Queensland admitted patient database to calculate the rate of mastectomy among 11,132 Queensland women who underwent surgery for removal of primary invasive breast cancers diagnosed in 2000-2005. Variation in mastectomy rate due to age, tumour size, rural residence, and area-based socioeconomic category was analysed through multivariate logistic regression.

Mastectomy accounted for 30% of all primary breast cancer surgeries in this study. The rate of mastectomy was 1.7 times higher in rural than in urban women; this difference remained nearly constant over the six-year period.

In multivariate regression, the mastectomy rate did not vary with socioeconomic category but increased with age and tumour size.

Mastectomy was significantly more common in rural compared to urban women regardless of age or tumour size (OR 2.1; 95% CI 1.9 – 2.3). Rural residence increased the odds of mastectomy even in young (< 40 year-old) women with T1 (< 2 cm) tumours (OR 1.8; CI 1.0 – 3.1).



Mastectomy rate (% of surgery) in Queensland women with invasive breast cancer diagnosed 2000-2005*

* Clusters represent groups of women in the same postcode. Group sizes range from 6 in the smallest to 402 in the largest cluster. Clusters with low mastectomy rate (< 26%) are located predominantly in the metropolitan southeast area.

Radiotherapy utilisation rates in Queensland public hospitals

Is there a gap in treatment delivery?

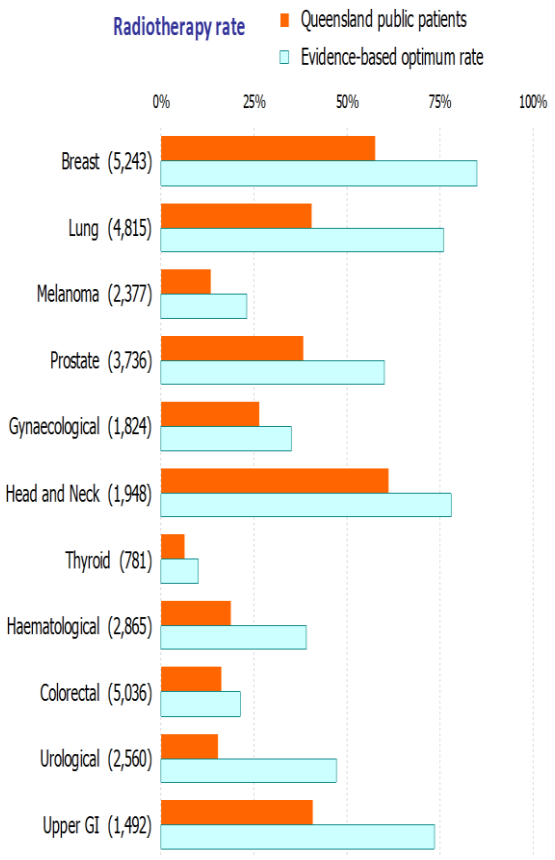
COSA 2008 Oral Presentation by Dr.Bryan Burmeister on behalf of QCCAT

The radiation treatment rate in Queensland public hospitals may be below optimum. Further study is needed to ascertain that treatment-eligible patients who do not receive radiation from public facilities are adequately treated in the private sector.

The demand for radiotherapy will grow rapidly as cancer incidence increases and the use of radiation treatment in palliative care becomes more common. To assist in resource planning, we estimated the radiation treatment rate of Queensland public hospital patients with invasive cancers and compared it to evidence-based optimum radiation therapy utilisation rates.

We pooled the data from all Queensland Health radiation oncology units and searched for records of at least one course of radiotherapy among Queensland residents who were notified to the Queensland Cancer Registry (QCR) with a known invasive primary tumour from 2000 to 2003 and who either received primary cancer therapy or palliative care at a public hospital or were admitted to a public hospital with cancer cited as a morbidity. We then compared the overall radiation treatment rates to optimum radiotherapy utilisation rates reported by the Collaboration for Cancer Outcomes Research and Evaluation (CCORE) in 2003.

A total of 68,467 new cases of invasive cancers with known primary sites and Queensland residence were notified to the registry in 2000-2003. Of these, 35,791 cases had at least one cancer-related treatment or admission at a Queensland Health facility. The overall radiotherapy rate of the latter group was 32%. The optimum radiation treatment rate for invasive cancers with similar mixture of tumour types is 55%. The relative difference between actual and optimum radiotherapy rates varies with tumour type, with gastrointestinal and renal cancers having higher than average shortfalls compared to other cancers.



For More Information

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