



15<sup>TH</sup> NATIONAL  
RURAL HEALTH  
CONFERENCE  
*Better together!*

24-27 MARCH 2019  
Hotel Grand Chancellor  
Hobart, Tasmania



NATIONAL RURAL  
HEALTH  
ALLIANCE LTD

## Victorian Lung Cancer Service Redesign Project: variation between rural and metropolitan outcomes

**Geraldine Largey<sup>1</sup>, Marita Reed<sup>2</sup>, Peter Briggs<sup>3</sup>, H Davis, Margaret Brand<sup>4</sup>, Robert G Stirling<sup>4</sup>**

<sup>1</sup>Southern Melbourne Integrated Cancer Service, <sup>2</sup>Department of Health and Human Services, <sup>3</sup>Monash Health, <sup>4</sup>Monash University

### Introduction

Lung cancer is the fifth most commonly diagnosed cancer and foremost cause of cancer death in Australia<sup>1</sup>. Current projections indicate 12,271 Australians are likely to be diagnosed with lung cancer in 2018<sup>2</sup> and that this is estimated to increase to 160,000 by 2028<sup>3</sup>. The five-year relative survival of 17% for those diagnosed with lung cancer is extremely poor compared with the 65% to 95% survival rates for those diagnosed with prostate, breast, colorectal and melanoma cancer<sup>4</sup>. Nationally, only 11.7% of lung cancer patients are diagnosed with stage 1 disease compared with 42.8% for breast, 35.9% for prostate and 22.1% for colorectal cancer<sup>5</sup>. Moreover, 28% of lung cancer patients in Australia are not staged at diagnosis<sup>6</sup>, potentially missing out on curative treatment options. A further 20% receive no treatment, while only one in two patients has access to best practice lung Multi-Disciplinary Team (MDT) care<sup>7</sup>.

Delays in the delivery of lung cancer care may be influenced by a number of health system factors. Critical appraisal of the literature has identified a number of factors responsible for inopportune management, including inappropriate specialist referral, a multitude of diagnostic investigations and health services attended to attain a lung cancer diagnosis<sup>8</sup>. A recent review of the factors responsible for delays in the delivery of acute care reported inadequate access to conclusive lung cancer diagnostic procedures and results as the primary cause (78%) of delays in 106 out of a 136 cases<sup>9</sup>. Other factors such as inequitable entry, poor communication, clerical delays and ineffective care coordination may cause further delays in the timeliness of lung cancer care<sup>10, 11</sup>. Such challenges are magnified for those in regional and rural Australia where approximately half of all those diagnosed with clinical stage III and IV lung cancer reside<sup>12</sup>. Restricted lung cancer diagnostic services in regional compared to urban regions limit the potential of early lesion detection<sup>13</sup>. Moreover, ready access to treatment is more limited in rural localities with patients frequently needing to travel greater distances to receive specialist treatment<sup>14</sup>. The recognised workforce shortage of lung cancer specialists in rural regions may further exacerbate delays in care delivery<sup>15</sup>.

The Victorian Lung Cancer Service Redesign Program (VLCSR) was established in 2016 to support development of local redesign projects to decrease delays in the diagnosis and treatment of lung cancer. Five redesign projects were conducted at three regional and two metropolitan health services in Victoria. Each project consisted of five clearly defined phases, a set up phase, diagnostic

phase, solution phase, implementation and evaluation phase and a sustainability phase. This paper distinguishes important variation in outcomes between the two regions.

## Methods

The Victorian Lung Cancer Registry (VLCR) was engaged to support a consistent approach to data collection and project evaluation. National and local site specific ethics approval to collect the required data from participating health services was obtained. Patients with a new diagnosis of primary lung cancer were prospectively enrolled over a six-month pre-implementation period (September 2016 to February 2017) and a six-month period of progressive local intervention implementation (from March to August 2017). A total of 205 subjects from all participating health services were recruited in the pre-implementation period and 224 in the implementation period. Summary statistics and time series analysis were performed to analyse indicator performance over a six-month period of observation pre-implementation (n=205) and a six-month period of local intervention implementation (n=224).

Service redesign methodologies were used to understand baseline performance and systematically improve processes by eliminating waste<sup>23-25</sup>, improving flow<sup>25-27</sup> and ensuring all processes added value for the patient<sup>28</sup>. A multidisciplinary diagnostic and solution workshop was conducted at each participating health service. Local service gaps, areas of variation and barriers to timeliness of care were identified. Root cause analysis was conducted and areas of data driven variation<sup>21</sup> prioritised for improvement. Clinician led, evidenced based design solutions were generated to address the identified gaps and improve the efficiency and effectiveness of services. The Principles for best practice management of lung cancer in Australia were integrated into the solution design<sup>29</sup>. Pilot design solutions were tested using Plan-Do-Study-Act (PDSA) iterative cycles, to better understand contributions to performance improvement<sup>30</sup>.

A series of Community of Practice forums were held over the life of the project to support collaborative learning, facilitate joint problem solving and propagate best practice improvements in the delivery of lung cancer care.

## Results

Regional subjects in the implementation period were more likely to be born in Australia (89% vs 61%) than their metropolitan counterparts. In regional areas from pre-implementation to implementation, clinical staging revealed an 11% increase in those diagnosed with stage I disease and a 17% decrease in those diagnosed with stage IV disease. The proportion of subjects with clinical stage not recorded in the medical record was greater in regional compared to metropolitan Victoria in both the pre-implementation (45% vs 29%) and implementation periods (41% vs 32%).

A comparison of the data from the pre-implementation and implementation periods revealed a reduction in the median time from referral to first specialist appointment with the metropolitan interval falling from 6 (IQR 0, 14) to 2 (IQR 0, 7) days and the regional interval from 9 (IQR 3, 20) to 6 (IQR 1, 14) days. Regional subjects experienced a noteworthy reduction in the first specialist appointment to Positron Emission Tomography (PET) scan interval, with a median decrease from 16 (IQR 6, 27) days to 12.0 (IQR 5, 27) days. Both metropolitan and regional subjects experienced a slight reduction in the median interval time from diagnosis to first treatment. There was a substantial increase in the proportion with a documented Multidisciplinary Meeting (MDM) in the medical record across both metropolitan (65% vs. 72%) and regional (50% vs 60%) areas. Supportive care screening tool was poorly documented across regional and metropolitan Victoria

## Conclusion

This study showed important differences in the performance of selected lung cancer indicators between metropolitan and regional Victoria.

## References

1. Australian Institute of Health and Welfare 2017. Cancer in Australia 2017. Cancer Series no.101. Cat.no.CAN 100. Canberra AWH.
2. Australian Institute of Health and Welfare, 2017. 'Cancer in diagnostic testing and care to meet recommended diagnosis and treatment timeframe Australia 2017' Cancer series no.101. Cat. no. CAN 100. Canberra: AIHW [online] Available from: <https://www.aihw.gov.au/reports/cancer/cancer-in-australia-2017>; Australian Government. Cancer Australia, 2018. 'Lung cancer statistics' [online] Available from: <https://lung-cancer.canceraustralia.gov.au>.
3. Incidence from 2017 to 2018: Australian Institute of Health and Welfare, 2017. 'Cancer in Australia 2017' Cancer series no.101. Cat. no. CAN 100. Canberra: AIHW [online] Available from: <https://www.aihw.gov.au/reports/cancer/cancer-in-australia-2017>; Incidence from 2019 to 2020: Australian Institute of Health and Welfare, 2012. 'Cancer incidence projections: Australia, 2011 to 2020', Cancer Series no. 66. Cat. No. CAN 62; Incidence from 2021 to 2028 (assumption of 2.0% growth per year, based on rate median growth from 1982-2014): Australian Institute of Health and Welfare, 2017. 'Australian Cancer Incidence and Mortality (ACIM) books' [online] Available from: <https://www.aihw.gov.au/reports/cancer/acim-books/contents/acim-books>.
4. Australian Government. Cancer Australia, 2018. 'Lung cancer statistics' [online] Available from: <https://lung-cancer.canceraustralia.gov.au>.
5. PwC analysis; National Cancer Control Indicators, 2018. 'Distribution of Cancer Stage' [online] Available from <https://ncci.canceraustralia.gov.au/diagnosis/distribution-cancer-stage/distribution-cancer-stage>; Kang, S, Koh, E, Vinod, S and B Jalaludin, 2012. 'Cost analysis of lung cancer management in South Western Sydney', *Journal of medical imaging and radiation oncology* 56 (235-241).
6. Cancer Australia. National Cancer Control Indicators. 'Stage distribution by cancer type and sex, 2011' [online] Available from: <https://ncci.canceraustralia.gov.au/diagnosis/distribution-cancer-stage/distribution-cancer-stage>.
7. Lung Foundation Australia. Making Lung Cancer A Fair Fight: A Blueprint for Reform. October 2018.
8. Olsson JK, Schultz EM, Gould MK. Timeliness of care in patients with lung cancer: a systematic review. *Thorax* 2009; 64: 749-756.
9. Malalasekera A, Nahm S, Blinman P, Kao S, Dhillon H and Vardy J. How long is too long? A scoping review of health system delays in lung cancer. *Eur Respir Rev* 2018; 27: 180045
10. Walsh J, Harrison JD, Young JM, Butow PN, Solomon MJ, Masya L. What are the current barriers to effective cancer care coordination? A qualitative study. *BMC Health Serv Res* 2010; 10: 132.
11. Brown S, Castelli M, Hunter DJ, Erskine J, Vedsted P, Foot C, Rubin G. How might healthcare systems influence speed of cancer diagnosis: anarrative review. *Soc Sci Med* 2014; 116: 55–63.8

12. Yap, S. et al, 2018. 'Patterns of care and emergency presentations for people with non-small cell lung cancer in New South Wales, Australia: A population-based study', Lung Cancer 122 (171-179); AIHW, 2016. 'Australia's Health 2016 - Australians: Who we are' [online] Available from: <https://www.aihw.gov.au/getmedia/ff410cf7-bd90-47dc-bf6b-22007c9a0904/ah16-1-2-australians-who-we-are.pdf.aspx>.
13. Fox P and Boyce A. Cancer health inequality persists in regional and remote Australia. Medical Journal Australia 2014; 201 (8): 445-446. [https://protect-au.mimecast.com/s/BNxcC3Q8Z5UXIKwZSqR\\_HL?domain=mja.com.au](https://protect-au.mimecast.com/s/BNxcC3Q8Z5UXIKwZSqR_HL?domain=mja.com.au)
14. Australian Institute of Health and Welfare. Rural and Remote Health Web Report. Last updated 29 May 2017. <https://www.aihw.gov.au/reports/rural-health/rural-remote-health/contents/rural-health>
15. Blinman P, Grimison P, Barton M, Crossing S, Walpole E, Wong N, Francis K and Koczwara B. The shortage of medical oncologists: the Australian Medical Oncologist Workforce Study. Medical Journal Australia 2012; 196: 58–61

## Presenter

**Geraldine Largey** is currently employed as Manager of Research and Special Projects at the Southern Melbourne Integrated Cancer Service, in Victoria. Geraldine has had an eclectic career pathway to date, holding a variety of senior positions in healthcare management, health service redesign, research, quality improvement and project management. Within her current role, Geraldine works in partnership with a wide and varied group of stakeholders to create a cancer care network which is flexible, sustainable, affordable and truly person centred. From 2016-2018, she led the Lung Cancer Service Redesign Program across five health services in Victoria promoting innovative utilisation of evidence to facilitate redesign of systems, processes, pathways and models for cancer care. In 2017-2018, Geraldine worked collaboratively with cancer researchers from Victoria, New South Wales and Queensland on a project led by Monash University, seeking to compare lung cancer diagnostic and treatment pathways for CALD and Anglo-Australian patients. Over the last two years, Geraldine worked with the Sydney Catalyst Translational Cancer Research Centre and clinicians from other states to develop a national consensus statement on lung cancer diagnostic intervals and data collection points that resulted in her co-authoring an ensuing article that was published in the medical journal of Respiriology in 2018.