



CAMPBELL RESEARCH & CONSULTING

A Survey of Ambulatory Chemotherapy Units in NSW

Final Report

Prepared for

Cancer Institute NSW

Level 1, Biomedical Building
Australian Technology Park
Eveleigh NSW 2015

November 2008

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Executive Summary

This report presents the findings of the “Survey of Ambulatory Chemotherapy Units in NSW”. This project was commissioned by the **Cancer Institute NSW** and conducted by Campbell Research & Consulting (**Campbell Research**).

Background

The Cancer Institute NSW was established in response to the need to further decrease the devastating impact of cancer. The Cancer Institute NSW is committed to curing cancer through promoting the best cancer research, prevention, early detection, treatment, and education initiatives.

The Cancer Institute NSW’s goal is to substantially improve cancer control and cure in NSW by:

- Reducing the incidence of cancer in the community;
- Increasing the survival rate of cancer patients;
- Improving quality of life for cancer patients and their carers;
- Operating as a source of expertise on cancer control for the government’s health service providers, medical researchers and the general community.

Objectives

The primary research objective was to conduct a survey with the Nurse Unit Managers (**NUMs**) of the NSW Ambulatory Chemotherapy Units (**Units**) about the areas that cause process bottlenecks as identified in the 2005 review: patient scheduling; staff mix/training; pathology; pharmacy; and challenges related to individual units.

Methodology

A survey with the NUMs of the ambulatory chemotherapy units in NSW was administered during the period 3rd September to 13th October 2008. The survey incorporated telephone follow-up calls and provided various options for completing the survey (online, telephone or hard copy self completion).

Of the 83 Ambulatory Chemotherapy Units in NSW, 48 responded via online and 22 responded using the hard copy of the questionnaire. Three Units indicated that they were no longer operating, reducing the number of Chemotherapy Units in NSW to 80. This represents an 88% response rate based on eligible Units provided by the Cancer Institute NSW of Ambulatory Chemotherapy Units in NSW.

Key Findings

Profile of ambulatory chemotherapy Units in NSW

The database provided by the Cancer Institute NSW indicated there were 83 Units in NSW that provided outpatient chemotherapy. Based on a self classification by Units, a total of 32 Units located in a metropolitan region responded to the survey; 14 from a regional area; 21 from a rural area; 2 from a remote area; 1 responded to the survey but did not indicate where they were located; and 13 Units did not respond to the survey.

Two in three (66%) were public Units, one in four (24%) were private units and one in ten (9%) were both public and private Units. The majority (69%) were not a dedicated cancer care Unit.



On average, there were more chairs than beds in outpatient chemotherapy Units (Table 1). In total there were an average of 8.5 chairs in each Unit and 2.5 beds in each Unit. Metropolitan Units were larger, on average, than regional Units and in turn rural and remote Units.

Table 1: Average number of chairs and beds in Units				
	Total	Location		
		Metro	Regional	Rural/remote
Resources				
Number of chairs in Unit	8.5 (7.0 median) *	11.3 (9.7)	7.9 (7.5)	4.9 (5.0)
Number of beds in Unit	2.5 (1.5 median)	3.6 (2.0)	1.9 (1.5)	1.4 (1.2)

The greatest numbers of patient presentations were planned visits (58.5 on average) (Table 2), although the majority of Units had to accommodate for unplanned presentations as well. In a typical week the Units experienced substantial unplanned demand:

- 83% indicated that they had unplanned chemotherapy visits (6.6 on average);
- 80% indicated that they planned re-scheduled chemotherapy visits (11.1 on average); and
- 65% indicated that they had unplanned re-scheduled appointments (2.8 on average).

There were more planned re-scheduled visits (11.1) compared to unplanned drop-ins (6.6), however, the median number of patient presentations indicated the opposite (2.6 and 5.2 respectively). This reflects the influence of a few Units that had a particularly high number of planned re-scheduled visits in a week.

Metropolitan Units, on average, serviced the greatest number of patient presentations and rural and remote Units the least number of patient presentations.

Table 2: Summary of patient presentations				
	Total	Location		
		Metro	Regional	Rural/remote
Demand – patient presentations on a typical week				
Planned visits	58.5 (46.0 median)*	83.2 (82.5)	58.4 (46.3)	24.2 (20.0)
Unplanned visits	6.6 (5.2 median)	7.1 (5.3)	6.3 (5.5)	6.3 (5.0)
Planned re-scheduled visits	11.1 (2.6 median)	20.5 (4.5)	4.3 (2.3)	3.0 (2.1)
Unplanned re-scheduled visits	2.8 (2.0 median)	3.1 (2.1)	3.4 (2.3)	2.2 (1.5)

* The first figure presented represents the average number; the second bracketed figure represents the median.

In a typical week, the majority of Units experienced a substantial amount of unplanned demand.



Work process effectiveness

In general, NUMs considered that the Unit was operating either very effectively (31%) or reasonably effectively (43%) and more private Units (94% very/reasonably effectively) were of this opinion compared to public Units (67%).

Business Plans were not common in Units (43%), although some had a plan currently under development (13%). Private Units were more likely to have a Business Plan or have one under development (77%) than public Units (48%).

Three quarters of Units perceived that they were operating at least reasonably effectively. Private Units were more likely than public Units to have a Business Plan or have one under development.

There was no relationship between perceptions of overall work process effectiveness and the development of a Business Plan.

Patient bookings

Two thirds of NUMs rated the processes for scheduling patients favourably (64% excellent/very good). However, the remaining third felt that, at a minimum, some improvement *must* be made. Half of the Units used manual diary system for patient bookings and this was most common in smaller Units and those located in rural and remote areas.

The type of staff responsible for the booking of patients appears to be a function of the size of the Unit with administrative staff and a nurse co-ordinator more often used by larger Units, and the treating nurse in smaller Units. Treating staff (nurse, doctors and other staff) took at least some responsibility for patient booking in three quarters of the Units, while only one quarter solely used administration staff and/or a nurse co-ordinator. The bookings of patients in Units was primarily handled by the treating nurse (69%) followed by administrative staff (44%) and a nurse co-ordinator (26%). A small proportion of treating doctors handled patient bookings (14%).

A manual diary system was used by half of the Units for patient bookings and only one quarter solely used administrative staff and/or a nurse co-ordinator for this purpose. Treating nurses often managed bookings.

One third of Units felt that, at a minimum, some improvement must be made for the scheduling of patients.

Staff resources

Flexibility in staff resourcing was important in Units to account for changing case loads. Close to one in three always or often increased the workload of existing staff (39%), extended operating hours (34%) or re-scheduled patients (27%). When staff took leave (both unplanned and planned), the most common way to manage absences was by increasing the workload of existing Unit nurses and to re-schedule patients. Half (47%) rated the flexibility of the staff roster as excellent/very good. Another quarter (24%) rated it as fair or poor. The effectiveness of staff rostering was generally rated favourably (69% excellent/very good). However, one in ten (9%) rated it as fair or poor.

Units in rural and remote areas were most likely to indicate that nursing staff often worked overtime and there was a tendency for greater re-scheduling of patients and extended operating hours to account for case load. As a result, rural and remote Units were less likely to give a positive rating (excellent or very good) for the flexibility and effectiveness of the staff roster compared to metropolitan Units.

Units operated with flexibility to account for changes in case load. Close to one third always or often increased the workload of existing staff, extended operating hours and re-scheduled patients. This was not always optimal as one in ten NUMs rated the effectiveness of staff rostering fair or poor; and one quarter rated the flexibility of the staff roster fair or poor.

Units in rural and remote areas most often had to make adjustments to staff resources for changes in case load.

Blood test results

More Units had access to an internal hospital pathology service and a private contractor (59%) than those that only used the hospital pathology service (31%) or outsourced all pathology services (6%). Most Units (87%) could access blood tests online and changes to patient scheduling because of delays with blood test results were reasonably uncommon – 10% never had delays and 47% almost never had to change the scheduling of patients because of delays with blood test results. Over one in ten (13%) often had to change the scheduling of patients because of a shortage of staff, delays in processing, unplanned chemotherapy and patients forgetting to have their blood test.

The reasonably uncommon frequency of delays with blood test results may be related to the practice of blood tests being done before the day of treatment. On average, 68% of Units reported blood tests were done before the day of treatment. Metropolitan Units were less likely to have tests done before the day of treatment (55%) and were less likely to never/almost never have to change patient scheduling because of test delays (41% compared to 57% across all Units).

More than half of the Units had access to an internal hospital pathology service and a private contractor. Delays with blood test results were reasonably uncommon which may be related to the practice of ordering blood tests before the day of treatment.

Changes to patient scheduling was more common in metropolitan Units that less often ordered blood tests before the day of treatment.

Pharmacy and preparation of chemotherapy agents

Over half of the Units (54%) used multiple pharmacy service providers and four in ten (41%) used just the one service provider. Off-site private providers (64%) and the main hospital pharmacy (57%) were used by a similar proportion of Units. A chemotherapy pharmacy in the Unit was used less frequently (29%) and almost exclusively by public Units.

Delays in obtaining chemotherapy agents were uncommon and did not affect scheduling in the Unit – 16% never and 50% almost never had to change patient appointments. A minority of Units (4%) often had the scheduling of patients affected by an inability to obtain chemotherapy agents. When chemotherapy agents were prepared on-site delays were more frequent – 19% often experienced delays in receiving chemotherapy agents and 33% sometimes did.

More than half the Units used multiple pharmacy service providers. Delays in obtaining chemotherapy agents were reasonably uncommon, but more so when prepared on-site.

Communication processes

Patient records at the time of treatment were most commonly *always* available when needed (74%) and if not they were *often* available (23%). Hardcopy communication of prescribing details from the treating doctor to the Unit was most common (50%), with just 29% of Units indicating that information is downloaded electronically.

Nevertheless, in terms of communication between the Unit and other parties in the treatment process, communication effectiveness was rated highest with the medical specialist. A similarly high rating was given for the effectiveness of communications between the Unit and the off-site pharmacy, hospital pharmacy and the hospital pathology provider. The communication was rated least favourably between the Unit and the patient's GP and the off-site pathology provider.

Effective communication between the Unit and the medical specialist was rated highly, even though communication of prescribing details was mostly in hardcopy form.

There is scope for improved communication between the Unit and the patient's GP and the off-site pathology provider.

Other issues affecting Unit operation

Units are faced with a range of other issues which might potentially impact on the effectiveness of the business operation. To some extent the increase in new patients impacts on a small proportion of Units – 14% a lot and 10% some impact. However, this is less than the challenges faced by: management of patients from Indigenous backgrounds (53% impact a lot); management of patients from non-English speaking backgrounds (41% a lot); and management of highly infectious patients (47% a lot).

In terms of the resources, the greatest impacts were: delays in radiology or radiological scan results (39% impact a lot) – more so than delays in blood test results and in pharmacy drugs; a lack of patient education (33% a lot); and a lack of communication with pharmacy (31% a lot).

In relative terms, the management of particular patients and resourcing issues had a greater impact on Unit operation than the outcomes resulting from these impacts: extended consultant time (27% impact a lot); booking of patients (17% a lot); complexity of treatment (13% a lot); and management of unplanned patient presentations (9% a lot).

Conclusions

Overall, most NUMs considered that their Unit was operating reasonably effectively and there was no consistent pattern identified between the development of a Business Plan and operational effectiveness. Nevertheless, private Units were more likely than public Units to have developed a Business Plan reflecting a business approach to improving efficiency.

While there was a reasonably strong perception of work process efficiency, the evidence of operational effectiveness was not as strong:

- Flexibility in staff resourcing was essential in Units as changes to planned case load were common. The majority of Units had to deal with unplanned demand on a weekly basis and this was achieved by close to a third increasing the workload of existing staff, re-scheduling patients and extending the hours of operation. The need for flexibility was notably greater in rural and remote Units;
- There was no systematic approach for managing planned and unplanned leave with the most Units increasing the workload of existing Unit nurses and re-scheduling patients;
- Manual booking systems were used by half of the Units, yet one third of NUMS considered that there was scope for improvement to the current process for the scheduling of patients. Automation may assist patient scheduling;
- Metropolitan Units were less likely to order blood tests the day before treatment than rural and remote Units, but were more likely to experience delays in obtaining results which then impacted on patient scheduling. There was evidence of improved work flow by ordering blood tests the day before treatment;
- Delays in radiology scan results had an affect on Units more so than blood test results and pharmacy delays;
- A lack of patient education was perceived to impact on Unit operation – this was most often handled by the treating nurse; and
- Communication between the Unit and the patient's GP and the off-site pathology provider (also an area impacting on the Unit operation) was rated least favourably with scope for improvement.

Reading This Report

This report presents findings from the Survey of Ambulatory Chemotherapy Units in NSW. The findings from the survey are supported by a series of graphs and tables.

Reading the tables

- Questions and responses are written in *Italics*.
- The base for each column is given in parentheses under the column header.
- 'n/a' means that the particular cell is not applicable and no result can be reported.
- Subtotals are right justified and printed in parentheses.
- Proportions are rounded to the nearest whole percent.

Reading the graphs

- The relevant survey questions are indicated underneath the graph header.
- Each column is a percentage of the base.
- The base for the graphs refers to the total number of responses upon which the percentages have been calculated. This is indicated under the left hand corner of the graph.

Analysis of results

- The total sample for the Survey of Ambulatory Chemotherapy Units in NSW is relatively small (n=70) yet represents a large proportion of the population (n=80 eligible Units).
- Only differences between sample groups which are statistically significant at the 95% confidence level are highlighted by Campbell Research. This is possible where the sample size for each of the sub-samples (e.g. metropolitan, regional and rural/remote) is at least 30. The sample size for each of the sub-samples in this survey is smaller than that used as a 'benchmark' for statistical testing.
- As the sample size for significance testing between sub-samples is below the guideline, in this report Campbell Research have reviewed the results and highlighted where large differences occur which are likely to reflect differences in business operation.

Acronyms and abbreviations used in this report

NUM	Nurse Unit Manager
Unit	Ambulatory Chemotherapy Units in NSW

1. Background

This report presents the findings from the survey of Ambulatory Chemotherapy Units in NSW (**the Project**). This project was commissioned by the **Cancer Institute NSW** and conducted by Campbell Research & Consulting (**Campbell Research**).

1.1 The Cancer Institute NSW

The Cancer Institute NSW was established in response to the need to further decrease the devastating impact of cancer. The Cancer Institute NSW is committed to curing cancer through promoting the best cancer research, prevention, early detection, treatment, and education initiatives.

The Cancer Institute NSW's goal is to substantially improve cancer control and cure in NSW by:

- Reducing the incidence of cancer in the community;
- Increasing the survival rate of cancer patients;
- Improving quality of life for cancer patients and their carers;
- Operating as a source of expertise on cancer control for the government's health service providers, medical researchers and the general community.

1.2 The NSW Cancer Plan

The Cancer Institute NSW created Australia's first state cancer plan – the NSW Cancer Plan 2004 - 06. The first cancer plan was successfully completed and delivered major improvements in reducing smoking rates; improving screening services; providing new staff and technology in hospitals; and increasing cancer research.

As part of the component of the programmes outlined in the NSW Cancer Plan 2004 - 2006, the Cancer Institute NSW has undertaken a 'Review of Ambulatory/Outpatient Chemotherapy and Haematology Services in NSW (inclusive of ACT)' in November 2005 (**the 2005 review**). The 2005 review recorded information on the centre's physical location, human resources, physical infrastructure, business management systems, access to pathology services, access to imaging services, and supply of chemotherapy. The review also provided baseline data that quantified patient and business activity at each of the treatment centres.

The Cancer Institute NSW has recently released the NSW Cancer Plan 2007 - 2010. One of the major components of the *Smarter Models of Care Program* (under Priority 3 – Improving Cancer Services and Professional Education of the NSW Cancer Plan) involves a commitment to develop a strategic business improvement program for ambulatory care services across NSW.

The Cancer Institute NSW commissioned Campbell Research to conduct a survey with the Nurse Unit Managers (NUMs) of the Ambulatory Chemotherapy Units across NSW (inclusive of ACT) as identified in the 2005 review.

1.3 Project Objectives

The primary research objective was to conduct a survey with the NUMs of the NSW Ambulatory Chemotherapy Units on the areas that cause process bottlenecks as identified in the 2005 review:

- Patient scheduling;
- Staff mix/training;
- Pathology;
- Pharmacy; and
- Challenges related to individual units.



The data collected from the survey would also allow for annual projection of information for each specific area/activity. CR&C have tabulated proportion of responses and presented mean and median scores to illustrate the survey findings.

The survey results will help provide advice to the Area Health Services and NSW Health on methods to improve business efficiency.

2. Methodology

Campbell Research has conducted an online survey with the Nurse Unit Managers (NUMs) of the ambulatory chemotherapy units in NSW.

The project commenced with desktop research and qualitative consultations to facilitate the development of the questionnaire. Qualitative consultations were conducted with two NUMs to identify the key issues related to process bottlenecks and confirm the scope of the questionnaire. The questionnaire was provided to the Cancer Institute NSW for comments and approval (Appendix A).

A survey with the NUMs of the ambulatory chemotherapy units in NSW was administered during the period: 3rd September to 13th October 2008. The survey incorporated telephone follow-up calls and provided various options for completing the survey (online, telephone or hard copy self completion).

The survey included a series of closed and open-ended questions about:

- The Ambulatory Chemotherapy Units;
- Booking of patient/staff;
- Communication to and from the Units;
- Staff resources;
- Overall work processes;
- Blood test results;
- Pharmacy and preparation of chemotherapy agent; and
- Other issues affecting the operation of the Units.

2.1.1 Recruitment

A database of the NUMs who participated in the 2005 review was provided by the Cancer Institute NSW to Campbell Research.

A primary approach letter (PAL) was sent out on the Cancer Institute NSW letterhead to the NUMs (Appendix B). A second PAL was also sent out on the Cancer Institute NSW letterhead to the Directors of Area Cancer Services and the Chief Executive Officers (CEOs) of the organisations (Appendix C) where the Units are located. An email invitation (Appendix D) was sent out by Campbell Research a week later to invite NUMs to participate in the online survey.

In addition, initial telephone calls were made by Campbell Research to the Units that were not contactable via email. Campbell Research has updated the contact list provided by the Cancer Institute NSW during the initial recruitment process.

2.1.2 Response rate

Of the 83 Ambulatory Chemotherapy Units in NSW, 48 responded via online and 22 responded using the hard copy of the questionnaire. Four declined the survey of which 3 were no longer operating as a chemotherapy Unit. After three e-mails and up to five follow-up telephone calls, 9 Units had not responded to requests for participation. In total, 70 Units participated in the survey representing 88% of the total eligible Ambulatory Chemotherapy Units in NSW (n=80).



3. Profile of the Ambulatory Chemotherapy Units

3.1 Profile of chemotherapy Units

In order to provide a profile of current service delivery by Ambulatory Chemotherapy Units the survey sought details about the location of the Unit, whether a public or private Unit and if it was a dedicated cancer care unit. These variables were used to detect if there were difference in the survey responses reported throughout the findings section.

Overall, there are known to be 80 Units in NSW providing outpatient chemotherapy services (3 Units indicated that they were no longer operating). Of these, 70 responded to the survey and through self-classification (Table 4):

- 32 Units (46%) were located in a metropolitan area;
- 14 Units (20%) were from a regional area;
- 21 Units (30%) were from a rural area; and
- 2 Units (3%) were from a remote area.

One unit did not indicate the area in which they operate.

Two in three (66%) were public Units, one in four (24%) were private units and one in ten (9%) were both public and private units. Close to one in five (22%) rural or remote Units operated as both a public and private Unit.

The majority (69%) were not a dedicated cancer care Unit, but treated other conditions regularly and this was common across all locations.

Table 4: Profile of chemotherapy Units				
<i>Q3: Is your Unit a...?</i>				
<i>Q5: Is your Unit a dedicated cancer care unit?</i>				
	Total (70) %	Location		
		Metro (32) %	Regional (14) %	Rural/remote (23) %
Public vs private				
Public	66	69	71	61
Private	24	31	21	17
Both	9	0	7	22
Missing data	1	0	0	0
Unit type				
Other conditions regularly treated	69	75	64	65
Dedicated cancer care unit	30	25	36	35
Missing data	1	0	0	0

3.2 Number of chairs in Unit

Among the 70 Units that responded to the survey (69 to this particular question) there were a total of 585 chairs across these Units in NSW (Figure 1). This equated to an average of 8.5 chairs in each Unit (or a median of 7.0 chairs per Unit).

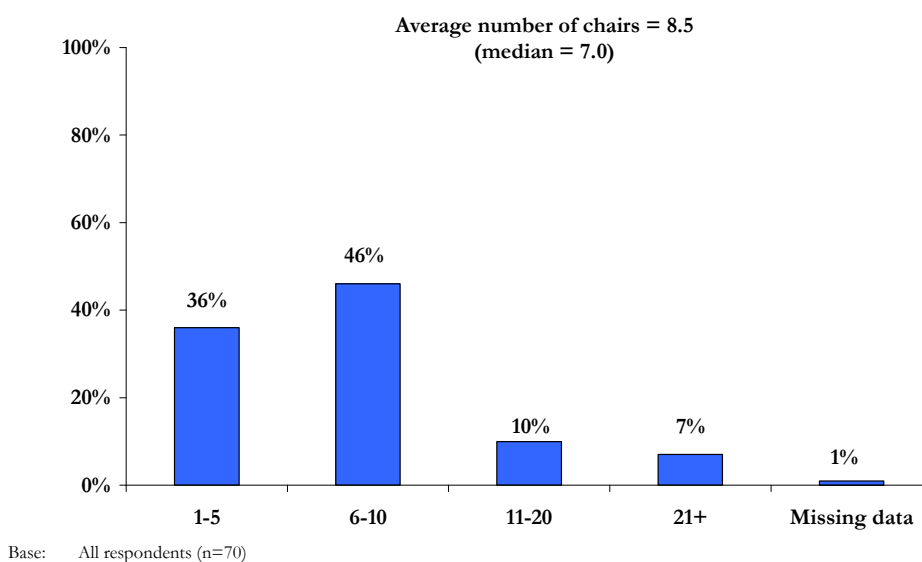
Four in five Units had between 1 and 5 chairs (36%) or 6 and 10 chairs (46%). There was a small proportion of Units that had more than 20 chairs (5 Units or 7% of those surveyed) which were all public Units located in a metropolitan area.

On average, there were more chairs in metropolitan Units and fewer in rural or remote Units:

- 11.3 chairs in each metropolitan Unit (363 chairs in total, and a median of 9.7);
- 7.9 chairs in each regional Unit (110 chairs in total, and a median of 7.5); and
- 4.9 chairs in each rural or remote Unit (112 chairs in total, and a median of 5.0).

Figure 1: Number of chairs in Unit

Q1. How many chairs are there in your Unit?



3.3 Number of beds in Unit

Among the 70 Units that responded to the survey (69 to this particular question) there were a total of 174 beds across these Units in NSW (Figure 2). This equated to an average of 2.5 beds in each Unit (or a median of 1.5 beds per Unit).

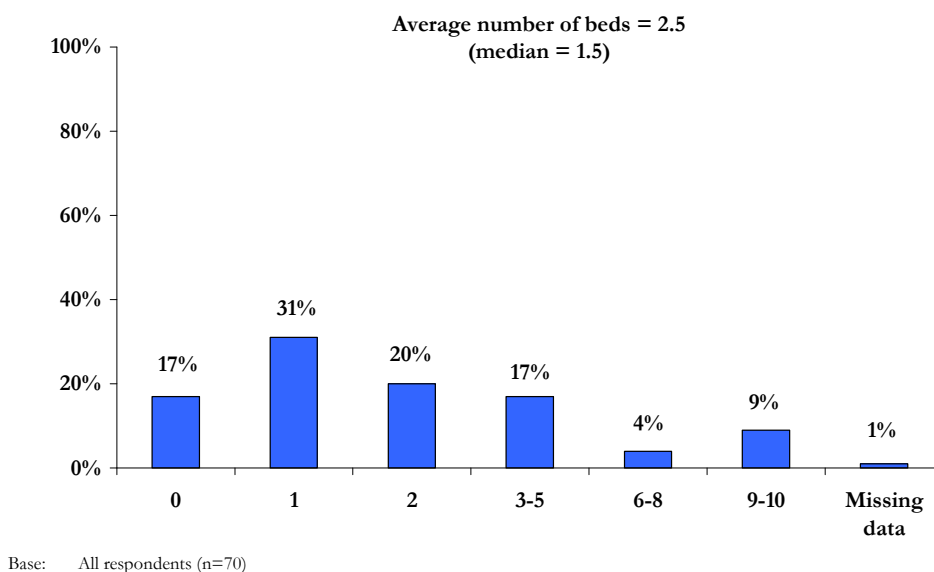
The majority of Units (81%) had at least one bed and half of the Units had either 1 bed (31%) or 2 beds (20%). Some Units did not have any beds (17%), but by definition of being a Unit, had chairs available for use. There was a small proportion of Units that had 9 or 10 beds (6 Units or 9% of those surveyed) which were all public Units located in a metropolitan area.

On average, there were more beds in metropolitan Units and fewer in rural or remote Units:

- 3.6 beds in each metropolitan Unit (116 beds in total, and a median of 2.0);
- 1.9 beds in each regional Unit (27 beds in total, and a median of 1.5); and
- 1.4 beds in each rural or remote Unit (31 beds in total, and a median of 1.2).

Figure 2: Number of beds in Unit

Q2. How many beds are there in your Unit?



3.4 Patient presentations

Resourcing bottlenecks of ambulatory chemotherapy Units is impacted on by the extent to which patient presentations are unplanned. Using a 'best estimate' approach, NUMs were asked to record the total number of patient presentation in their Unit on a typical week. A patient chemotherapy visit was defined a single visit by a single cancer patient, on any given day, to the Unit to receive chemotherapy.

3.4.1 Number of planned and unplanned visits in a week

In a typical week, each Unit received an average of 58.5 *planned visits* or a total of 4,037 planned chemotherapy visits in a week (Figure 3):

- 30% of Units received between 1 and 25 planned visits;
- 24% received 26 to 50 visits; and
- 16% received more than 100 planned visits in a week.

On average, there were more planned visits in metropolitan Units and fewer in rural or remote Units, which is a function of the number of chairs and beds in these Units:

- 83.2 planned visits in each metropolitan Unit in a week (2,663 planned visits in total, and a median of 82.5);
- 58.4 planned visits in each regional Unit (818 planned visits in total, and a median of 46.3); and
- 24.2 planned visits in each rural or remote Unit (556 planned visits in total, and a median of 20.0).

In a typical week, each Unit received an average of 6.6 *unplanned visits* or a total of 459 unplanned patient drop-ins in a week (Figure 4):

- 16% of Units had no patient drop-ins;
- 39% received between 1 and 5 unplanned drop-ins;
- 33% received between 6 and 10 unplanned visits; and
- 11% had 11 or more unplanned patient drop-ins in a week.

On average, the number of unplanned visits in metropolitan Units did not differ largely to remote Units:

- 7.1 unplanned visits in each metropolitan Unit in a week (226 unplanned visits in total, and a median of 5.3);
- 6.3 unplanned visits in each regional Unit (88 unplanned visits in total, and a median of 5.5); and
- 6.3 unplanned visits in each rural or remote Unit (145 unplanned visits in total, and a median of 5.0).

Figure 3: Number of planned visits in a week

Q6. Record the total number of patient presentation in your Unit on a typical week...

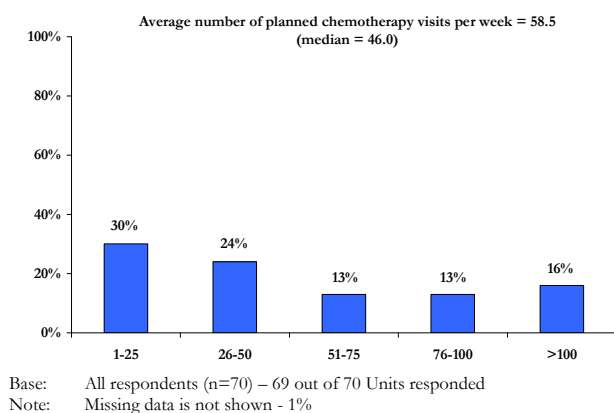
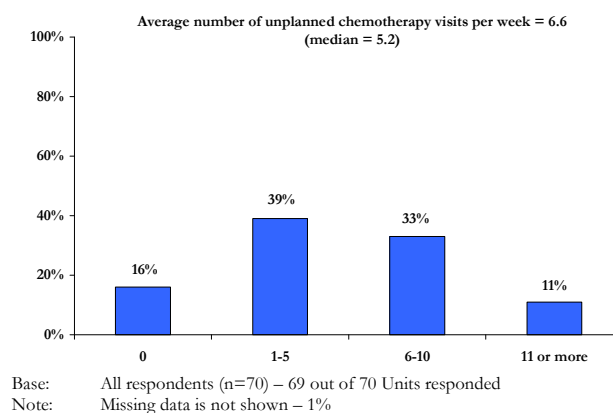


Figure 4: Number of unplanned visits in a week

Q6. Record the total number of patient presentation in your Unit on a typical week...



3.4.2 Number of planned and unplanned re-scheduled visits in a week

On average, there were more planned re-scheduled patient chemotherapy visits in a typical week compared to unplanned re-schedule visits (i.e. when the patient comes in but not at the re-scheduled time). In a normal week:

- Each Unit dealt with 11.1 *planned* re-scheduled visits (744 in total), although one in seven (14%) indicated that they did not have planned re-scheduled visits (Figure 5); and
- Each Unit dealt with 2.8 *unplanned* re-scheduled visits (198 in total), with three in ten (30%) indicating that they typically did not have any unplanned re-scheduled visits (Figure 6).

A small proportion of Units had at least 11 *planned* re-scheduled visits (9%) and 11 or more *unplanned* re-scheduled chemotherapy visits (3%) in a week. Planned re-scheduled visits were most numerous in metropolitan Units (20.5 on average; 4.5 median). Units which did not have a Business Plan were less likely to have to deal with planned re-scheduled visits compared to those that did have a Business Plan /under development (69% and 87% respectively) and unplanned re-scheduled visits (52% and 72% respectively).

Figure 5: Number of planned re-scheduled visits in week

Q6. Record the total number of patient presentation in your Unit on a typical week...

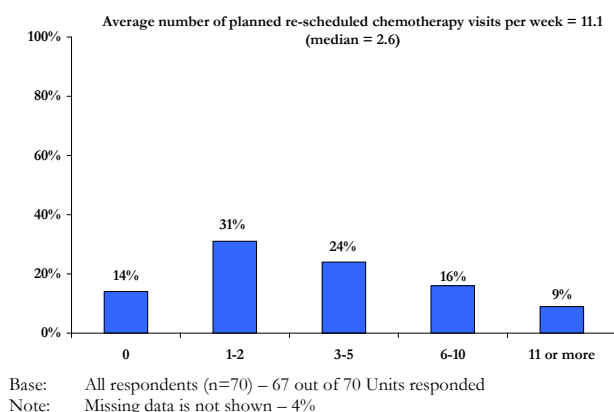
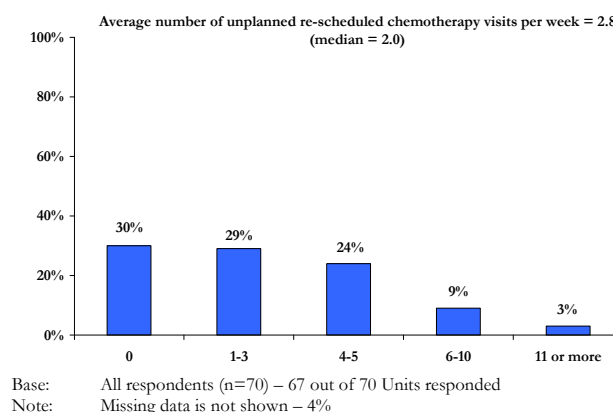


Figure 6: Number of unplanned re-scheduled visits in week

Q6. Record the total number of patient presentation in your Unit on a typical week...



4. Business management

4.1 Effectiveness of work processes and Business Plan

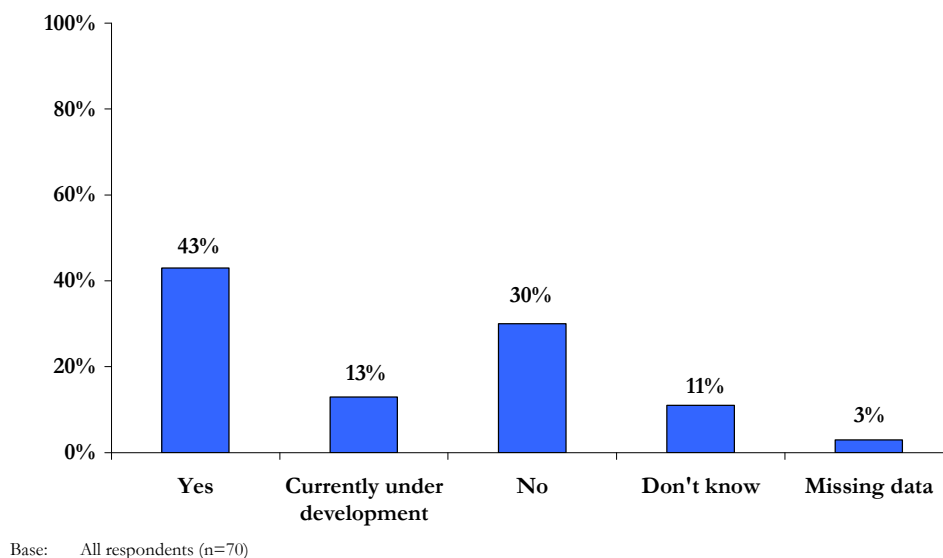
4.1.1 Business Plan

At present, Business Plans were not common in Units having been developed by 30 of the 70 Units (43%) (Figure 7). A further 9 Units (13%) indicated that a Business Plan was under development. Another 11% (8 Units) of NUMs were uncertain if they had a Business Plan, and 5 of the 8 Units were located in a rural/remote area.

Private Units were more likely to have developed a Business Plan or to have one under development (77%) than public chemotherapy units (48%).

Figure 7: Business Plans in Unit

Q22. Does your Unit have a Business Plan?



4.1.2 Overall effectiveness of work processes

NUMs were asked their view on the overall efficiency of the work processes in their Unit. In general, the Unit was perceived to be operating at least reasonably effectively (Figure 8):

- 31% rated the Unit as operating very effectively; and
- 43% rated the Unit as operating reasonably effectively.

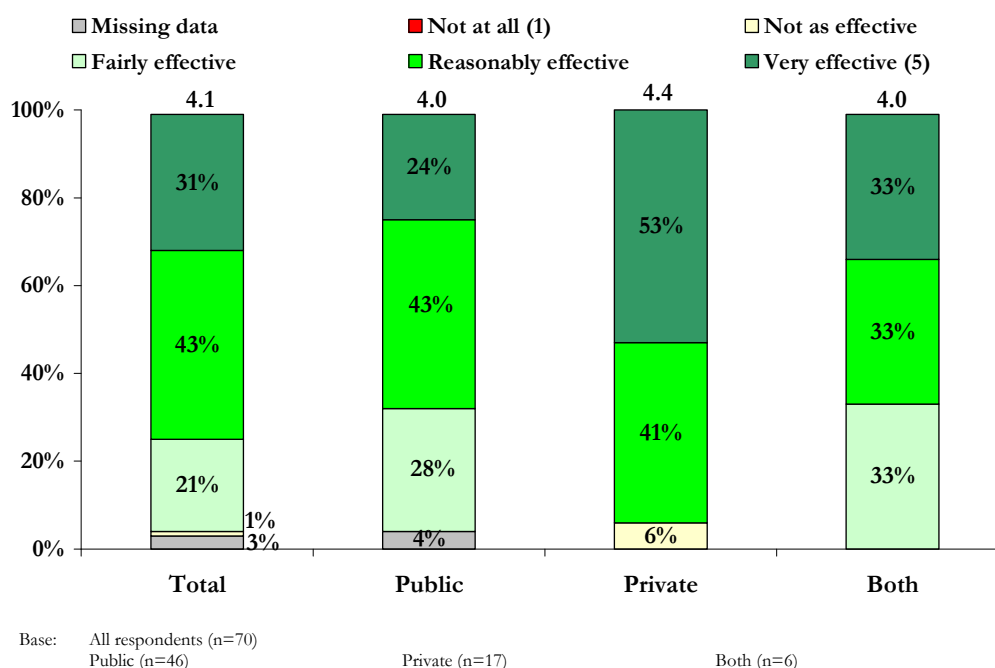
One Unit considered that they were not operating effectively as they could.

NUMs working in private Units were more likely to rate the Unit as operating at least reasonably effectively (94%) compared to those in public Units (67%) and both public and private Units (67%).

Interestingly, there does not appear to be a relationship between those that had a Business Plan or have a Plan under development and perceptions of operational effectiveness. For example, of those that had a Business Plan (or one under development) 69% thought that they were operating at least reasonably effectively compared to 86% of those that did not have a plan (or were uncertain). Therefore, there is not a strong motivation for Business Plan development among those that don't have Plan as they perceive that they are already operating reasonably well without one.

Figure 8: Overall effectiveness of work processes

Q21. Thinking about the overall work processes in your Unit, would you say your Unit is operating (...) effectively?



4.2 Booking of patients

Patient bookings were handled by a combination of staff (Figure 9):

- 69% of Units indicated that the treating nurse was responsible for patient bookings;
- 44% had administration staff involved in patient bookings;
- 26% had a nurse co-ordinator dedicated for the booking of patients;
- 14% had the treating doctor handle patient bookings; and
- 10% mentioned other staff.

Overall, 17 of the 70 Units (24%) had administration staff and/or a nurse co-ordinator handle the booking of patients. Treating staff (nurse, doctors and other staff) took at least some responsibility for patient bookings in three in four Units (74%).

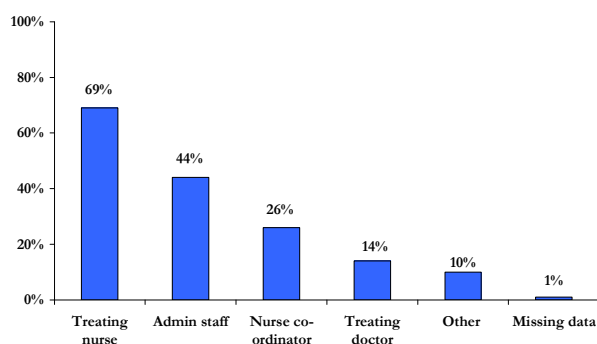
Half (51%) of the Units indicated that one person was responsible for patient bookings: 9% used only administration staff; 6% had a dedicated nurse co-ordinator; and 37% had the treating nurse book patients. The balance of Units (47%) had two or more classifications of staff take responsibility for patient bookings; most of these (36%) involved both administration staff and another member of the Unit.

The type of staff responsible for the booking of patients appears to be a function of the size of the Unit. Administrative staff (62%) and a nurse co-ordinator (54%) were more often used in larger Units (11 or more chairs) compared to those with between 1 and 5 chairs (24% and 16% respectively). Conversely, there was a greater reliance on the treating nurse taking patient bookings in smaller Units (84%) compared to larger Units (31%).

Close to half (46%) of the Units used a manual diary system for making patient bookings (Figure 10) and this was particularly common in smaller Units with 1 to 5 chairs (80%), private Units (71%) and Units located in rural or remote areas (61%). Hospital electronic outpatient bookings systems were used by one in five Units (21%) and almost exclusively by public, or both public and private Units (14 of the 15 Units). Half of the Units (54%) with 11 or more chairs used a hospital electronic booking system. VARIS (6%) and LANTIS (3%) were used infrequently and no Unit mentioned using ORCIS. Other systems used included: CHARM; VARIAN-ARIA; ACTPAS; IPM; BLUECHIP; MOSAIQ; Multi Access; Cerner Scheduler and Caduceus.

Figure 9: Booking of patients

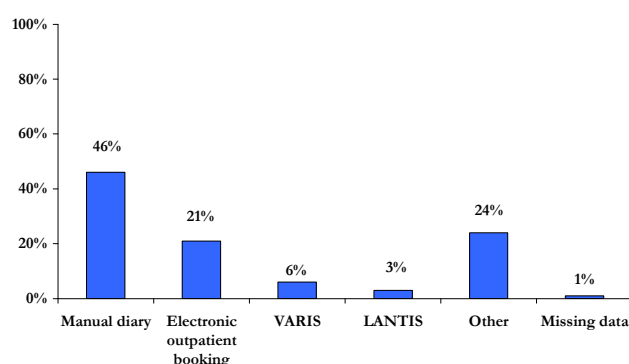
Q7. Who handles the booking of patients at your Unit? Who is responsible for the provision of education to new patients?



Base: All respondents (n=70)
Note: Multiple response possible

Figure 10: Booking system

Q10. Which booking system is used?



Base: All respondents (n=70)

NUMs were asked to rate the effectiveness of the current process for the scheduling of patients. The scale used was:

- Excellent – no improvement necessary;
- Very good – some improvement *could* be made;
- Good – some improvement *must* be made;
- Fair – substantial improvements must be made; and
- Poor – the entire process must be changed.

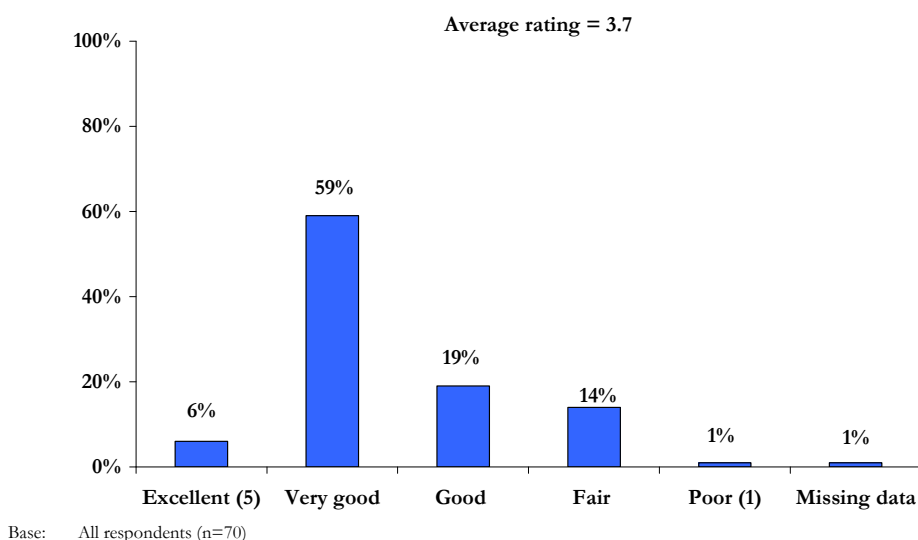
The effectiveness of the current process for the scheduling of patients was generally rated favourably:

- Two in three (64%) rated the booking process as either excellent (6%) or very good (59%);
- A further one in five (19%) rated the process as good, that is, they felt that some improvement must be made.

One in six (16%) NUMs considered that at a minimum, substantial improvements must be made to the process for scheduling patients. This view was shared across Units located throughout the State. Importantly, substantial room for improvement was greatest among those who rated their operational effectiveness at best fairly effective (44%) – compared to 8% of those who felt they were operating either very or reasonably effectively.

Figure 11: Effectiveness of current processes for scheduling

Q11. How would you rate the effectiveness of the current process for the scheduling of patients??



4.3 Staff resources

The effectiveness of staff resourcing can either help or hinder business processes in Units. Areas of staff resourcing that were explored included: staff rostering effectiveness and flexibility; the level of overtime currently worked by nursing staff; and the way in which planned and unplanned leave by nursing staff is managed.

4.3.1 Staff rostering

Staff rostering effectiveness was rated more favourably than staff roster flexibility.

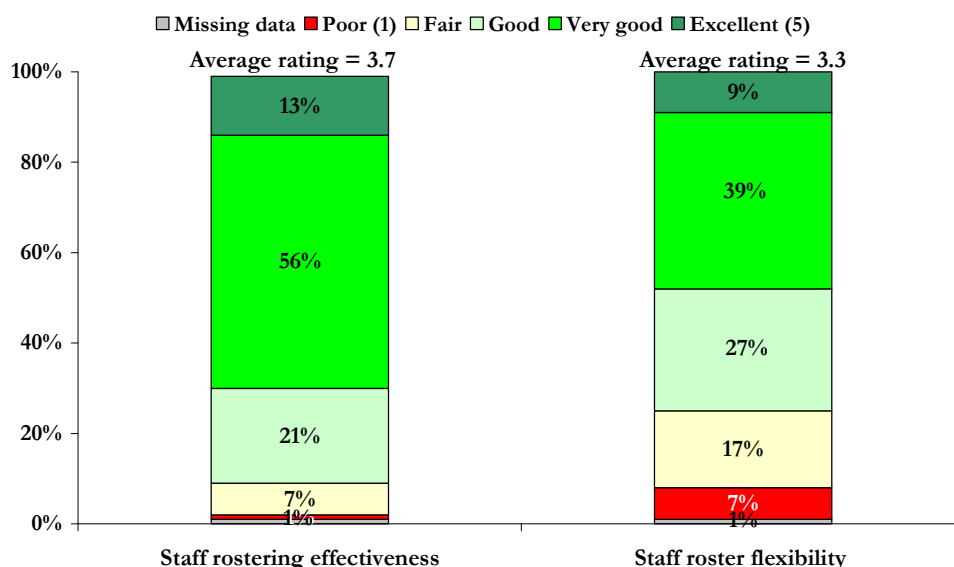
Overall, seven in ten (69%) NUMs rated the effectiveness of staff rostering as either excellent (13%) or very good (56%) (Figure 12). One in ten (9%) rated staff rostering as fair or poor, although close to one in five (17%) Units in rural and remote areas did so.

In contrast, five in ten (47%) rated the flexibility of the staff roster as either excellent (9%) or very good (39%). Another one in four (24%) rated the flexibility of the staff roster as fair or poor. Metropolitan Units were most favourable in their rating of the flexibility of the nursing staff roster (63% excellent or very good) and those in rural and remote areas were least favourable (26% and 35% gave a rating of fair or poor).

Figure 12: Staff rostering effectiveness and flexibility

Q12. How would you rate the effectiveness of the rostering of staff?

Q13. Is your nursing staff roster flexible enough to accommodate changes to case load?



Base: All respondents (n=70)

4.3.2 Overtime by staff

Overtime by nursing staff appears to occur reasonably frequently (Figure 13):

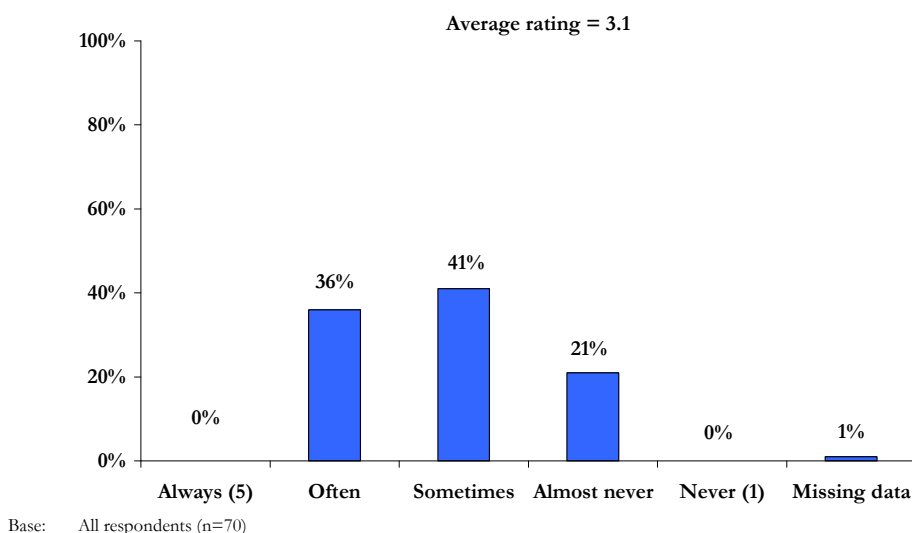
- Under four in ten (36%) NUMs indicated that nursing staff often worked overtime; and
- Four in ten (41%) indicated that nursing staff are sometimes called upon to work overtime.

The greatest difference in the amount of overtime taken on by nursing staff was seen in rural and remote Units:

- One in two (52%) of Units in rural and remote areas indicated that nursing staff often worked overtime;
- One in three (36%) Units in regional areas indicated that nursing staff often worked overtime; and
- One in five (22%) Units in metropolitan areas said that nursing staff often worked overtime.

Figure 13: Frequency of nursing staff working overtime

Q20. How often do nursing staff work overtime?



4.3.3 Staff resourcing for leave

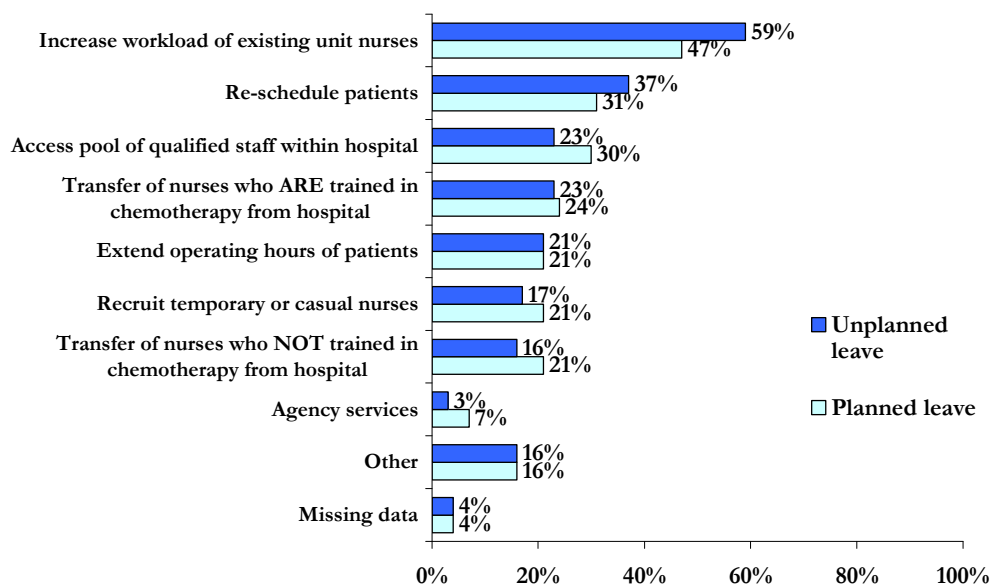
When nursing staff take unplanned and planned leave, the most common way to manage absences was by increasing the workload of existing Unit nurses. However, NUMs indicated that this was a more common approach for unplanned leave (59%) compared to planned leave (47%) (Figure 14). Re-scheduling patients was more frequently used as a means to account for the gaps in staff resourcing for unplanned leave (37%) compared to planned leave (31%). While extended operating hours for patients was used with similar frequency as a means to manage unplanned and planned leave by nursing staff (21% each).

When leave is planned Units can draw upon a wider variety of staff resources including accessing a pool of qualified staff from within the hospital (30%), transferring nurses who are trained in chemotherapy from the hospital (24%), recruiting temporary or casual nurses (21%) and transferring nurses who are not trained in chemotherapy from the hospital (21%). Each of these staff measures was mentioned less frequently as an approach to fill unplanned leave.

When analysed by the location of the Unit, transferring nurses from the hospital who were *not* trained in chemotherapy was a more common approach to address unplanned and planned leave in rural and remote areas (26% and 30% respectively) compared to metropolitan areas (9% and 13% respectively).

Figure 14: Staff resourcing for leave

Q19. How is workload managed when nursing staff take planned (e.g. holidays, training)/unplanned leave (e.g. sick, bereavement)?



Base: All respondents (n=70)
Note: Multiple response possible



4.3.4 Frequency of changes to planned operation

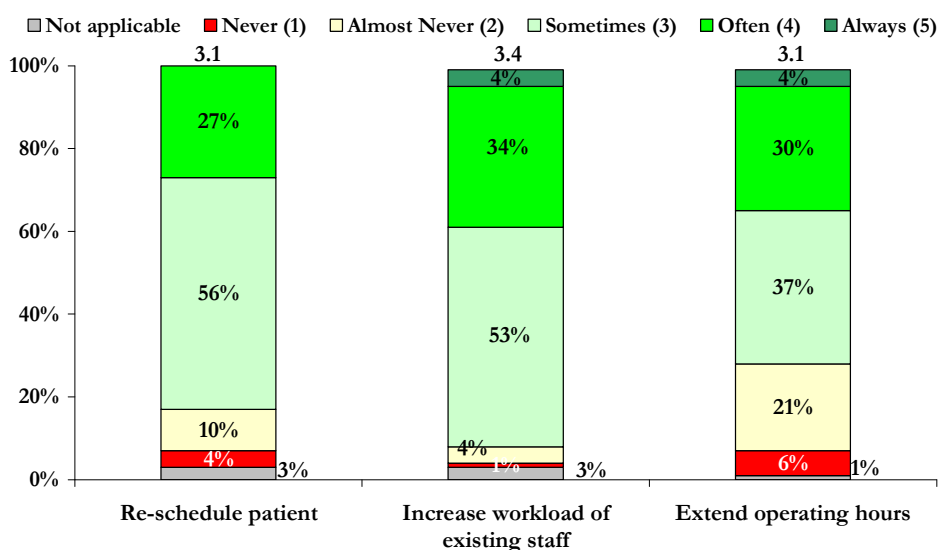
The way in which staff resourcing was managed for planned and unplanned leave and the frequency of staff working overtime reflects the need for a flexible work environment in Units in order to manage changes to case load. This is further demonstrated in terms of the frequency of changes being made to planned operations.

Close to one in three Units always or often (Figure 15):

- Increased the workload of existing staff (39%);
- Extended operating hours (34%) – and 27% never or almost never did so; and
- Re-scheduled patients (27%).

Figure 15: Frequency of changes to planned operation

Q18. How often does your unit have to...?



Base: All respondents (n=70)

Regional Units were least likely to always or often re-schedule patients (14%) compared to those located in other areas, but were most likely to increase the workload of existing staff (50%) (Table 5). Two in five (43%) rural and remote Units always or often extended operating hours.

Q18: How often does your Unit have to...?				
	Total (70) %	Location		
		Metro (32) %	Regional (14) %	Rural/remote (23) %
Re-schedule patients	27	25	14	35
Increase workload of existing staff	39	34	50	35
Extend operating hours	34	31	29	43

4.3.5 Staff development

Professional development is the central strategy to attract and retain staff with over eight in ten (84%) mentioning this as an approach. This is supplemented by mentorship programs (34%) and using a nurse educator (24%). Almost half (47%) of metropolitan Units indicated that they used nurse educators to attract and retain staff.

Other strategies were mentioned by one in four (27%) Units and included:

- A supportive and flexible work culture, including flexible rostering practices (hours and days), movement to other areas (e.g. radiotherapy) a culture of clinical support within the Unit and training opportunities for nurses;
- Staff rotation between the treatment unit and the in-patient unit;
- A graduate program; and
- Internal recruitment.

4.4 Education of patients

Throughout NSW Units, nine in ten (91%) Units indicated that the treating nurse was responsible for the provision of education to new patients (Figure 16). The treating doctor also took a lead in the provision of education to new patients in one in four Units (26%) – although no regional Units.

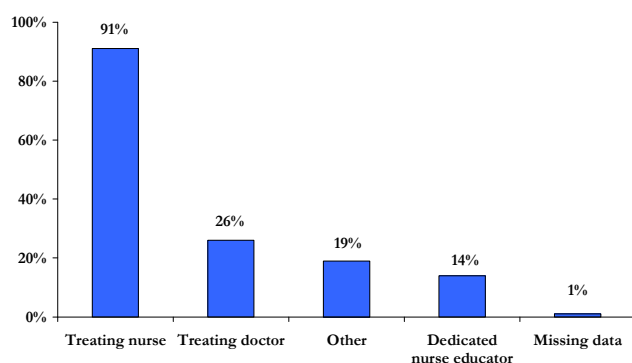
A dedicated nurse educator was less frequently named as being responsible for new patient education (14%) and was almost exclusively used in metropolitan Units (9 out of the 10 Units using a nurse educator).

Another educator was mentioned by one in five (19%) Units and most commonly included: a clinical nurse consultant; and a nurse practitioner or cancer liaison nurse.

Group education sessions for new patients were fairly uncommon, with one in five (21%) Units adopting this approach (Figure 17). These sessions were conducted exclusively in public Units (or both public and private).

Figure 16: Responsibility for education

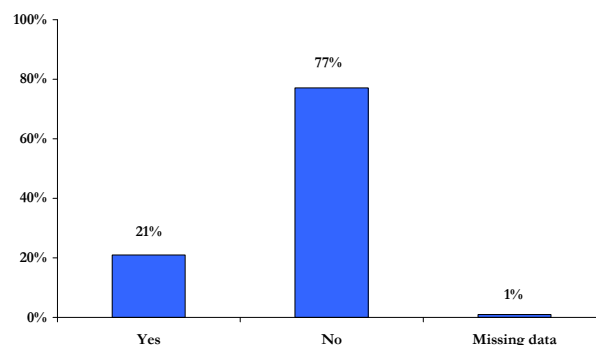
Q8. Who is responsible for the provision of education to new patients?



Base: All respondents (n=70)
Note: Multiple response possible

Figure 17: Group education sessions

Q9. Does your Unit conduct group education sessions for new patients?



Base: All respondents (n=70)

5. Communication

Access to timely information and effective lines of communication are essential to streamline business processes. The availability of patient records at the time of treatment and the effectiveness of communication between the Unit and others involved in the treatment process were explored.

5.1 Availability of patient records at time of treatment

Three in four Units (74%) indicated that nursing staff always had access to patient medical records at the time of treatment, with almost all of the balance often having access to the records (23%) (Figure 14). One Unit in a rural or remote area indicated that they almost never had access to patient medical records at the time of treatment.

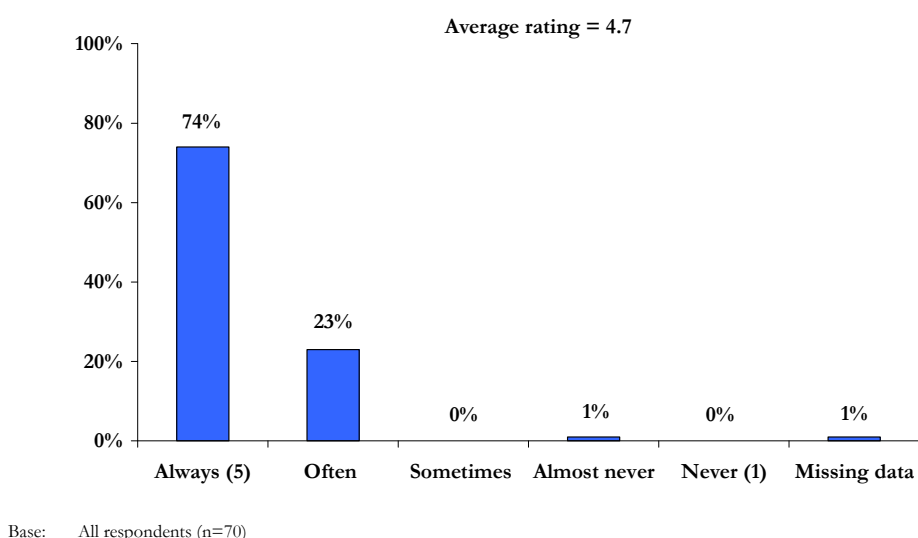
There were indications that the communications of prescribing details from the treating doctor to the Unit are not currently automated. While the optimal approach is for the treating doctor to put the information into a database and the Unit is then able to download the information electronically, only 29% of Units (when prompted) indicated that this approach was taken.

Overall, half (50%) of the Units indicated that some form of hardcopy communication, such as, a fax, letter or script, from the treating doctor to the Unit is involved. Other ways in which details from the treating doctor are communicated to the Unit included, in frequency of mention:

- Through the pharmacy (24%);
- Verbal communication between the doctor and the Unit (16%);
- Unspecified direct form of communication (13%); and
- Through the patient (10%).

Figure 18: Availability of patient records at time of treatment

Q14. How often do nursing staff have access to patient medical records at the time of the treatment?



5.2 Effectiveness of communication between Unit and other parties

In general, half of the NUMs assessed the communication between their Unit and parties involved in the treatment of the patient as either excellent or very good. Almost two in five NUMs indicated that they did not have involvement with an in-patient cancer unit (37%) and an off-site pharmacy (39%). For comparability an average effectiveness rating has been calculated as the level of exposure to parties differed – the higher the average the better the rating of effectiveness, with a top score of 5 possible.

The communication flow was rated similarly between four parties and the Unit and was highest for (Figure 19):

- Medical specialists (3.9 out of 5; 76% excellent/very good);
- Off-site pharmacy (3.9; 43% excellent/very good);
- Hospital pathology provider (3.8; 64% excellent/very good); and
- Hospital pharmacy (3.8; 60% excellent/very good).

Slightly lower levels of effective communication were recorded for:

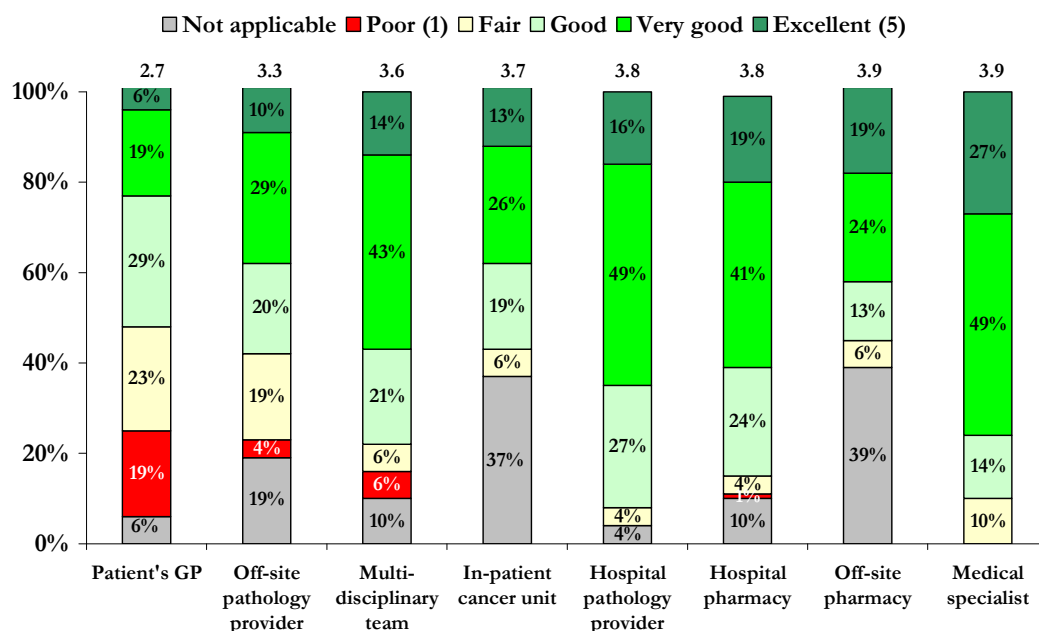
- In-patient cancer care unit (3.7; 39% excellent/very good); and
- Multi-disciplinary team (3.6; 57% excellent/very good).

The communication was rated least favourably between the Unit and the:

- Off-site pathology provider (3.3; 39% excellent/very good) – 23% gave a rating of fair or poor; and
- Patient's GP (2.7; 24% excellent/very good) – 41% gave a rating of fair or poor.

Figure 19: Effectiveness of communication between Unit and other parties

Q16. *How would you rate the communication between your Unit and each of the following?*



Base: All respondents (n=70)

6. Blood test results

Blood test results were identified as a process bottleneck area. Aspects of blood testing were investigated including: blood test services used; level of tests occurring before treatment day; access to on-line results; and impacts on patient scheduling due to delays in blood test results.

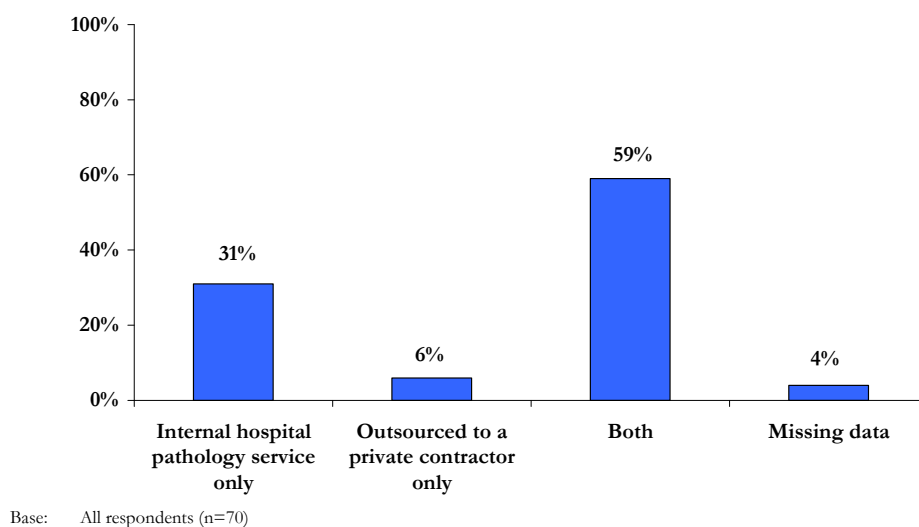
6.1 Blood testing services used

Three in five (59%) chemotherapy Units had access to both internal hospital pathology services and a private contractor, rather than rely on only the internal hospital pathology service (31%) or an external private contractor (6% – only used by private Units). There were differences in the pattern of use by location:

- Half (47%) of metropolitan services only used the internal hospital pathology service;
- Half (50%) of regional Units used both an internal and external provider; and
- Four in five (83%) rural and remote Units use both an internal and external provider.

Figure 20: Blood testing services used

Q23. What types of blood testing services are available in your Unit?



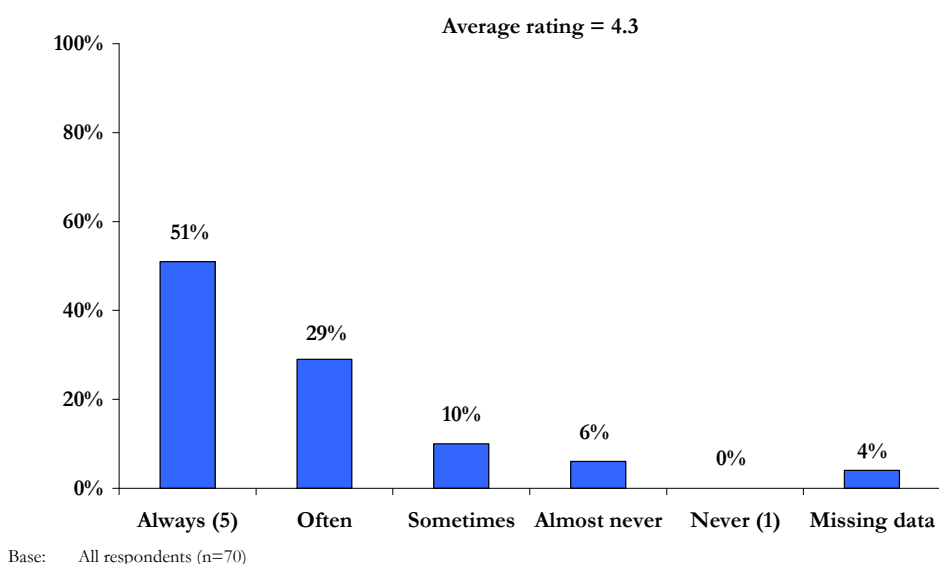
6.2 Advising blood tests done before treatment day

Unit staff frequently advises patients to have blood tests done before the day of treatment. Half (51%) always advised patients to have tests done early and another three in ten (29%) often advised patients to have blood tests done before the day of treatment (Figure 21). Those less likely to advise patients to have blood tests done before the day of treatment included:

- Metropolitan Units (66% always/often) – compared to regional (86%) and rural /remote Units (96%);
- Larger Units (11 or more chairs) (62% always/often); and
- Those Units that did not have a Business Plan (or one under development) (69%) – compared to those that had a Plan (92%).

Figure 21: Advise patients to have blood tests done before treatment day

Q25. Does the Unit staff advise patients to have the blood tests done before the treatment day?



6.3 Proportion of blood tests done before day of treatment

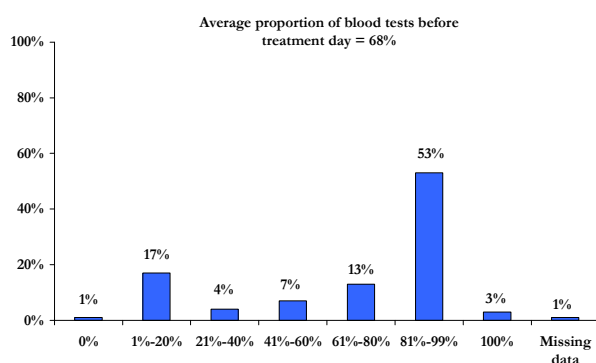
On average based on Units¹, 68% of blood tests were done before the day of treatment and 32% of blood tests were done on the day of treatment (Figure 22). Half (53%) of the Units indicated that between 81% and 99% of blood tests were done before treatment day and another one in ten (13%) estimated between 61% and 80% of tests were done before treatment day.

On average:

- Metropolitan Units were less likely to have blood tests done before treatment day (55%), particularly compared to rural and remote Units (85%) – aligning with fewer advising patients to have blood tests done before treatment;
- Public Units were less likely to have blood tests done before treatment day (66%) compared to private Units (74%); and
- Larger Units were less likely to order blood tests early (42% on average before treatment day).

Figure 22: Distribution of blood tests before treatment

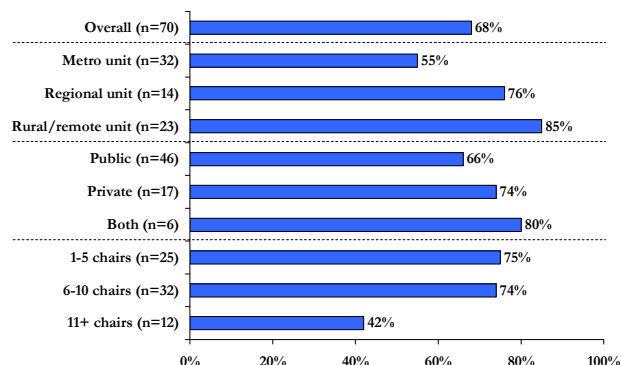
Q24. Please indicate the proportion of the blood tests being done before treatment day.



Base: All respondents (n=70)

Figure 23: Average proportion of blood tests before treatment day by classification of Unit

Q24. Please indicate the proportion of the blood tests being done before treatment day.



Base: All respondents (n=70)

¹ The average is based on the number of Units conducting blood tests before treatment rather than the absolute number of blood tests conducted by these Units before treatment day.

6.4 Accessibility of blood test results and impact on scheduling

Nine in ten Units (87%) were able to access blood tests online with similar results recorded by location of the Unit and type of Unit (Figure 24). To some extent, smaller Units (1 to 5 chairs) were less likely to be able to access blood test results online (76%) compared to larger Units.

Changes to patient scheduling because of delays with blood test results were reasonably uncommon (Figure 24):

- One in ten (10%) never had delays impact on patient scheduling; and
- Half (47%) almost never experienced delays.

Those able to access blood test results online were not less likely to have delays in receiving blood test results compared to those that could not access results online. However, there were a number of other differences in the incidence experiencing delays in blood tests results that then impacted on patient scheduling:

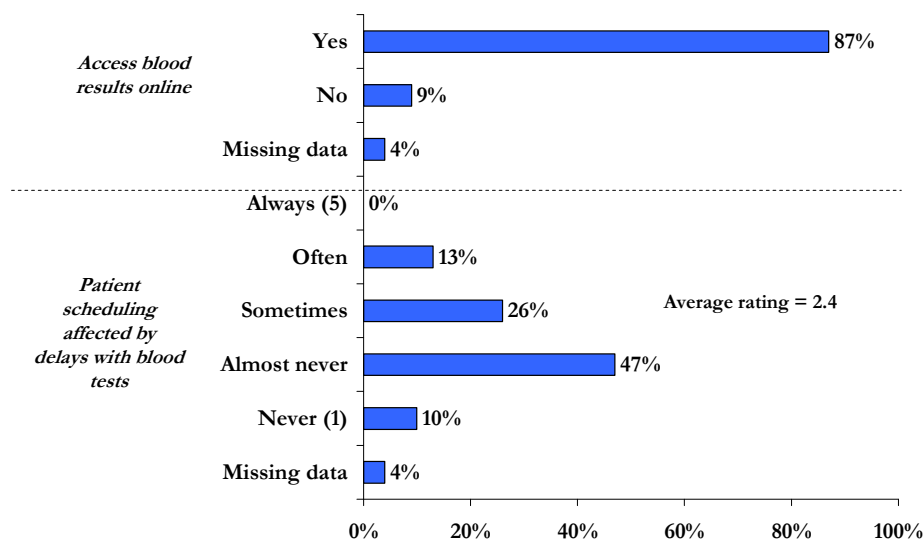
- Metropolitan Units (41%) were less likely than regional (71%) and rural and remote Units (74%) to never or almost never have this experience; and
- Units that only used an internal hospital pathology service (50%) were less likely than those that used both an internal and external provider of pathology services (63%) to never or almost never have delays.

Close to one in ten Units (13%) often had to change patient scheduling because of delays with blood test results. All of these were not dedicated cancer care Units and there was a tendency for these to be located in a metropolitan area (19%).

Figure 24: Accessibility of blood test results and impact on scheduling

Q26. Can you access blood results online?

Q27. How often is patient scheduling affected because of delays with blood test results?



Base: All respondents (n=70)

For Units that often or sometimes had patient scheduling affected because of delays with blood test results, the main reasons given were: the patient forgetting to attend for the blood test or repeats of a test were required; computer glitches making results unavailable; and general delays in processing which may have been a function of staff shortages or technical problems with the machinery. Unplanned chemotherapy was a common reason for patient scheduling to be affected by delays with blood test results.

7. Pharmacy and preparation of chemotherapy agent

Pharmacy was identified as a process bottleneck area. Aspects of pharmacy and the preparation of chemotherapy agents were investigated including: pharmacy services used; impact on patient scheduling due to an inability to obtain chemotherapy agents; and the level of delay in chemotherapy agents prepared on-site.

7.1 Pharmacy services used

Units had access to a number of pharmacy services. Two in three Units (64%) used an off-site provider and a similar proportion used the main hospital pharmacy (57%). Three in ten Units (29%) used a chemotherapy pharmacy in the Unit. In terms of the combination of pharmacy services used:

- Over half (54%) used multiple sources of pharmacy services; and
- Four in ten (41%) used just the one service provider – 7% main hospital pharmacy; 14% the chemotherapy pharmacy in the Unit; and 20% used an off-site provider.

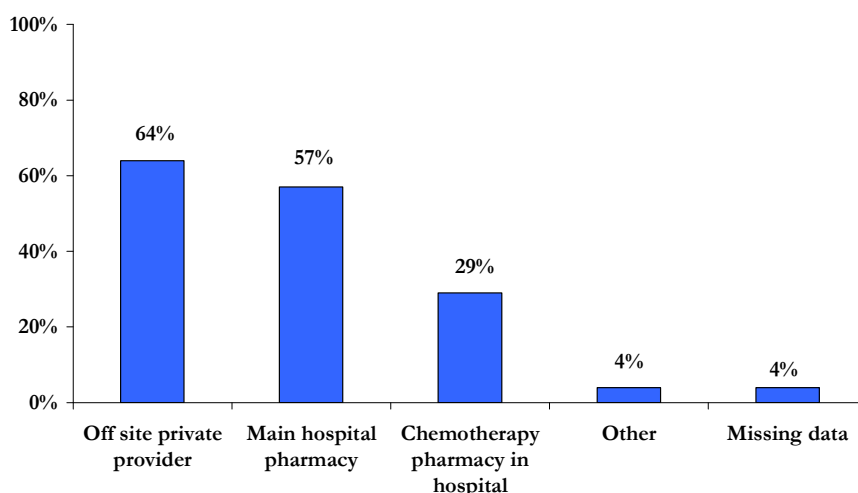
There were differences in the pattern of use of pharmacy services by location:

- Off-site private providers were more often used by rural and remote Units (87%) compared to metropolitan Units (50%);
- Off-site private providers were more often used by private (88%) compared to public Units (50%);
- Chemotherapy pharmacy in a hospital was more often used by metropolitan (47%) compared to rural and remote Units (9%); and
- Chemotherapy pharmacy in a hospital was more often used by public (41%) compared to private Units (6%).

Use of an off-site provider was more common among Units that also used the main hospital pharmacy (73%) compared to Units that also used the chemotherapy pharmacy in the Unit (25%).

Figure 25: Pharmacy services used

Q29. *What types of pharmacy services are available to your Unit?*



Base: All respondents (n=70)
Note: Multiple response possible

7.2 Accessibility of blood test results and impact on scheduling

Changes to patient scheduling because of an inability to obtain chemotherapy agents was reasonably uncommon (Figure 26), and less so compared to delays experienced with blood test results (Section 6.4):

- One in six Units (16%) never experienced an inability to obtain chemotherapy agents; and
- Half (50%) almost never experienced delays.

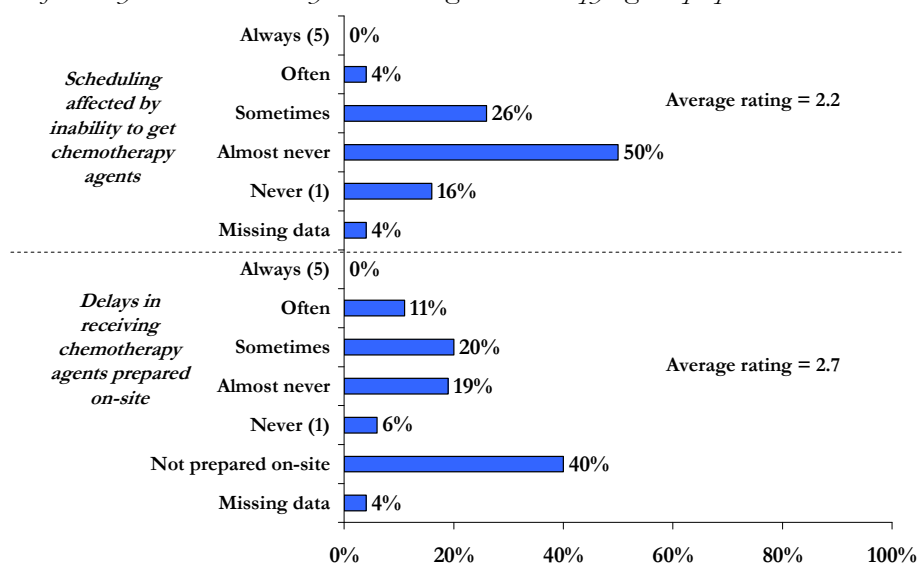
Only a minority (4%) often had to change patient scheduling because of an inability to source chemotherapy agents. All of these were not dedicated cancer care Units.

Based on all Units, one in ten (11%) indicated that they often encountered delays in receiving chemotherapy agents prepared on-site, and when based on those that used an on-site service this increased to two in ten (19%) often experiencing delays from the on-site service provider. A further 20% of Units (33% based on those using on-site service) sometimes encountered delays.

Figure 26: Accessibility of chemotherapy agents and impact on scheduling

Q30. How often is scheduling in your Unit affected by an inability to obtain chemotherapy agents?

Q31. How often do you encounter delays in receiving chemotherapy agents prepared on-site?



Base: All respondents (n=70)

A range of reasons were given for the delay in the preparation of chemotherapy agents being mentioned by between two in ten and close to three in ten Units:

- Unplanned chemotherapy (34% - based on all Units);
- Chemotherapy agents not being stored on-site (27%);
- A shortage of oncology pharmacists (23%);
- Treatment alterations are not communicated to the pharmacy in advance (26%);
- Incomplete prescription by the doctor (19%); and
- Pharmacy's limited operating hours (17%).

One in four (26%) indicated that the question was not relevant to them.

8. Other issues affecting the operation of the Units

Units are faced with numerous issues which may potentially impact on the effectiveness of the business operation. The extent to which these other factors impacted on the Unit's operation was explored. The results have been classified as inputs (e.g. the type of patient's presenting for treatment); resourcing (e.g. elements in the treatment process); and outcomes (e.g. the impact on business efficiency).

For comparability across issues, an average score has been calculated. The lower the score, the less impact the issue has on the operation of the Unit.

8.1 Impact of other issues affecting Unit operation

8.1.1 Inputs affecting Unit operation

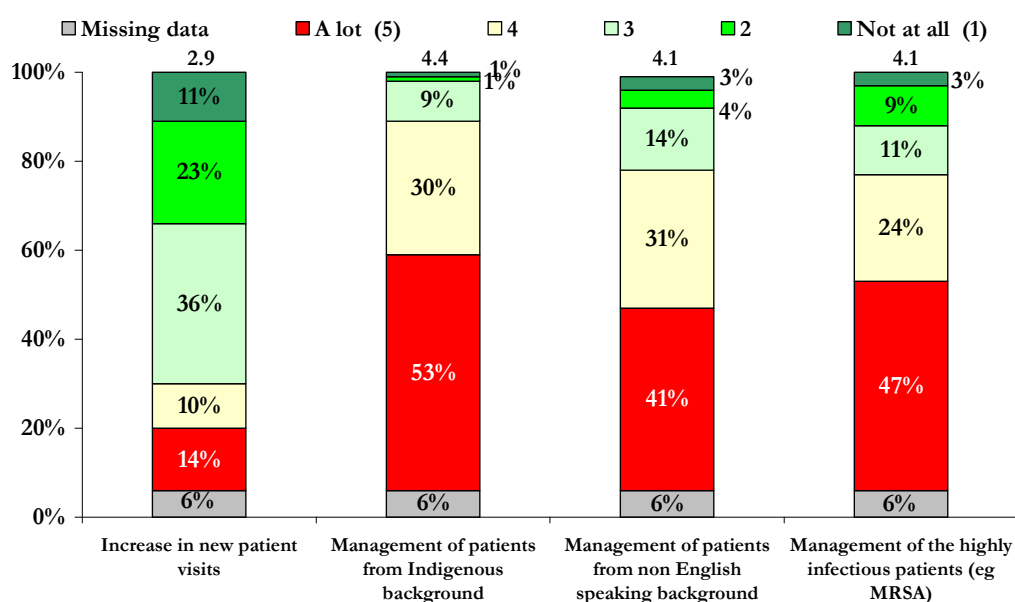
Demand for chemotherapy services, that is, the presentation of new patients could be an issue placing additional pressure on resources throughout the treatment process. Overall, one in seven Units (14%) considered the increase in new patients visits impacted on the Unit a lot and another one in ten (10%) felt it to have some impact on the Unit (Figure 27). Conversely, one in ten (11%) rated that the increase in new patients did not at all affect the Unit. An average score of 2.9 – with 3.0 reflecting average impact - was recorded for an increase in new patients.

In terms of inputs, the type of patient presented Units with the greatest challenge:

- Management of patients from Indigenous backgrounds (53% a lot; 4.4 average out of 5 for impact);
- Management of patients from non-English speaking backgrounds (41% a lot; average 4.1); and
- Management of highly infectious patients (47% a lot; average 4.1).

Figure 27: Inputs affecting Unit operation

Q33. Below is a list of issues that may or may not affect your Unit. For each statement, please indicate whether it affects your Unit a lot or not at all?



Base: All respondents (n=70)

8.1.2 Resources affecting Unit operation

In terms of the resources that may affect the operation of the Unit, the greatest impacts were (Figure 28):

- Delays in radiology or radiological scan results (39% a lot; 4.2 average);
- A lack of patient education (33% a lot; 4.1 average); and
- A lack of communication with pharmacy (31% a lot; average 4.0).

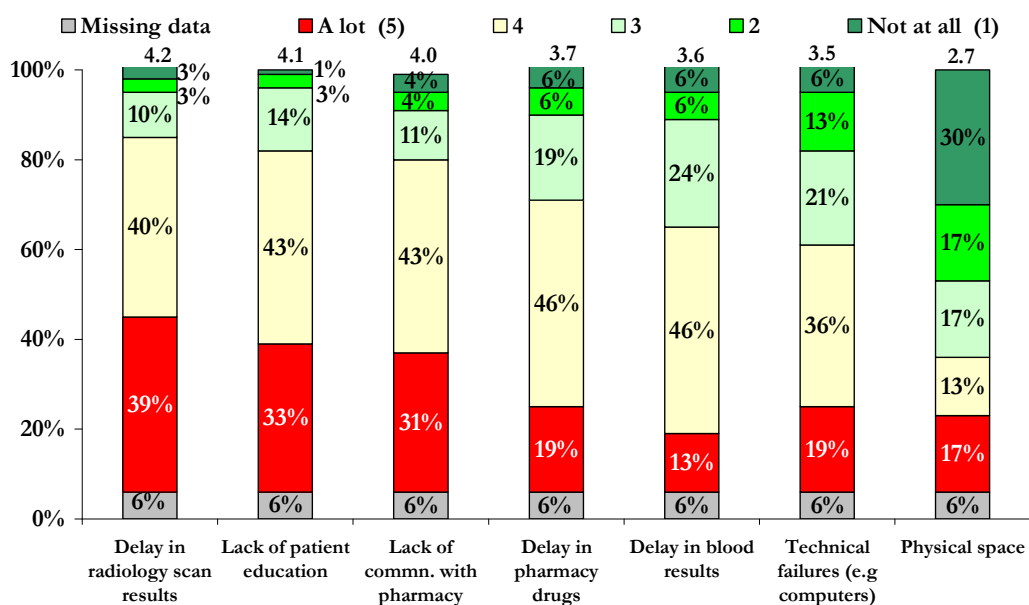
In relative terms, delays in pharmacy drugs (3.7 average) and delays in blood test results (3.6) had less affect on Units than delays in radiology results (4.2).

One in five (19%) Units indicated that technical failures affected their Unit a lot (3.5 average).

On average, the physical space did not affect the Unit as much as other resourcing issues. Three in ten (30%) indicated that it had no affect on the Unit at all, compared to two in ten (17%) who considered the physical space to affect the Unit a lot (2.7 average).

Figure 28: Resources affecting Unit operation

Q33. Below is a list of issues that may or may not affect your Unit. For each statement, please indicate whether it affects your Unit a lot or not at all?



Base: All respondents (n=70)



8.1.3 Outcomes affecting Unit operation

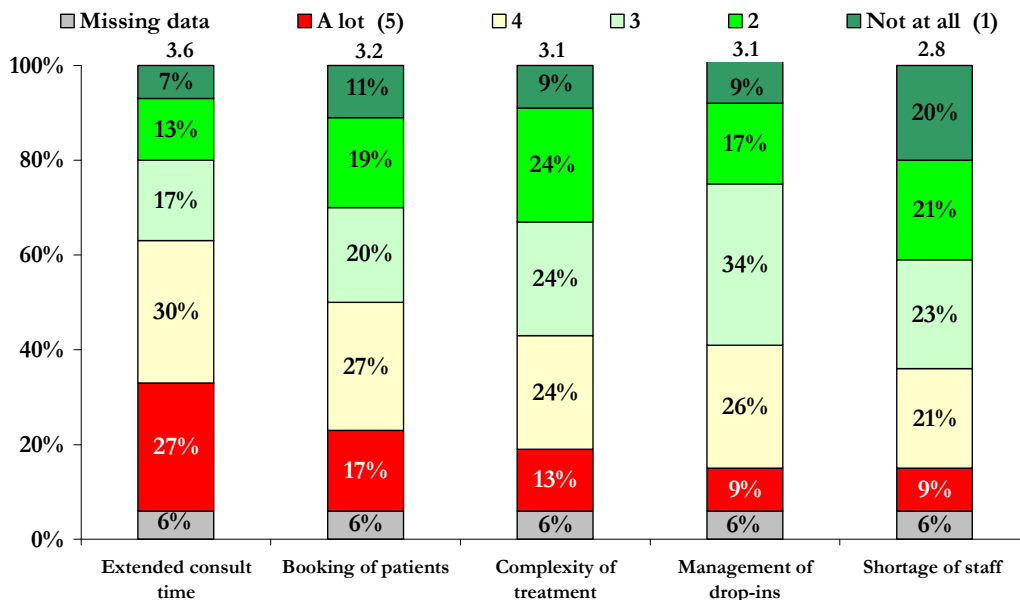
An extended consultant time affected the Unit operation more so than the booking of patients, the complexity of treatment and the management of drop-ins (Figure 29):

- Extended consultant time (27% a lot; 3.6 average);
- Booking of patients (17% a lot; 3.2 average);
- Complexity of treatment (13% a lot; 3.1 average); and
- Management of unplanned patient presentations (9% a lot; 3.1 average).

A shortage of staff was, on balance, not an issue affecting the operation of the Unit. Two in ten (20%) NUMs indicated that it did not at all impact on Unit operation, while one in ten (9%) considered that it had a lot of an impact (2.8 average).

Figure 29: Outcomes affecting Unit operation

Q33. Below is a list of issues that may or may not affect your Unit. For each statement, please indicate whether it affects your Unit a lot or not at all?



Base: All respondents (n=70)

Other issues affecting Unit functioning

NUMs were given the opportunity to indicate any other issues that had affected the functioning of their unit. The most frequently mentioned comments related to staffing:

- A lack of specialists;
I had both oncologists retire this year and do not have replacements yet so my clinic is now not doing chemotherapy.
Not enough consultants available.
- A lack of trained staff – staff shortages
It's hard to attract nurses to this field.
Recruitment and retention of staff.
There has been the need to train from “scratch” which has been labour intensive for existing staff.
- No Clinical Nurse Educators;
- The skill mix of staff; and
- A lack of administrative staff.

Other issues affecting the functioning of the chemotherapy Units included:

- Use of manual scheduling;
An online pharmacy medication order/ booking system would add greatly to the functioning of the unit.
- Lack of physical space to work safely;
- Lack of privacy (ie. procedure room); and
- Shortage of equipment, such as infusion and ambulatory pumps.

8.2 Suggested improvements to service delivery

NUMs were asked what suggestions they had to improve the effectiveness of service delivery for their Unit. Overall, 50 of the 70 NUMs who participated in the survey offered comments. The themes, or areas for improvement, included:

- Increases to the physical space to allow for increasing patient numbers;
- Changes being made to the hours of operation, which could better utilise existing resources;
- Changes to staffing levels and guidelines to be developed outlining nursing staff to oncologist ratios and nursing staff to patient ratios;
- A move to improved IT and booking systems; and
- More flexibility in blood test timing and the holding of chemotherapy agents.

Clearly the ability to action these suggestion is limited by resource availability. Nevertheless, a selection of comments are presented under each of the themes.

Increase in space

Increase in space and identify an area for medical only patients.

We need more space desperately.

Govt & or area health service to support & fund enlargement of treatment room.

Better design of clinical/ treatment areas.

Need purpose built areas to adequately accommodate expanding patient numbers.

A new Oncology Unit or upgrading of existing unit that is shared with Blood Bank.

A much larger unit in regards to space and OH&S.

Hours of operation

Appropriate use of capacity in ambulatory medical oncology units is essential. If you look at the majority of medical oncology units, services are provided Monday to Friday from 0800 - 1630. This means that only 1/3 of available physical capacity is being used

Staffing

Specialists

Increase in the number of Medical Oncologists working at the Centre would enable further improvements in workload distribution / staffing.

Visiting specialists.

Increase in medical oncologist time - ie full time medical oncologist, with full access and back up, ie leave cover, from major metropolitan oncology team.

Encourage more oncologists to use the unit for the local population. A lot of the local population have to travel out of the area for private treatment when the service is available close to home because their consultant will not use the unit.

Nursing staff

Increase number of staff accredited to deliver chemotherapy.

Extended roles for nursing staff.

Annual leave replacement.

Access to suitably qualified oncology nurses to take up part time positions.



There needs to be acknowledgement of the complexity and responsibility of the role of oncology nurses. A replacement nurse filling my role in my absence takes a cut in pay if they are employed solely as an oncology nurse.

Nurse educators

Access to a cancer specific clinical nurse educator.

Employ a clinical nurse educator.

Full time clinical nurse educator.

Clerical support

We desperately require clerical assistance.

Improved support for main hospital, dedicated inpatient unit, oncology registrar, permanent CMO position filled, community outreach programme, increase staffing to increase number of funded chairs.

Guidelines for operation

State NSW guidelines needed for patient nurse ratio in chemotherapy units - to provide safe and legal practice.

Having a ratio of nursing staff per medical oncologist - as the radiation oncology college has done for radiation oncology.

Patient bookings and management

Limited number of bookings per day.

Patients sticking to booked time to turn up not an hour before. Strict booking times.

Chemotherapy nursing staff to co-ordinate chemotherapy treatment times.

Continuing effective communication with the GPs in regards to patient booking times that are suitable for both the patient and the health professionals that are providing the service.

More regional clinics to reduce waiting time for new patients, reviews & when unexpected illness & disease progression.

IT and booking systems

Awaiting an upgrade of Lantis/MultiAccess - should improve some currently identified issues.

Comprehensive IT system (for scheduling, chemotherapy prescriptions, pt histories, etc)

The need of an electronic ordering and booking system.

Computerised medical record system to improve access for all medical/nursing/multidisciplinary staff to patient information/ drug history/ current treatment/ tests and investigations.

Electronic chemo flow sheets.

Electronic booking system for chemotherapy treatments, currently only clinic appointments are done electronically.

Efficient reporting of pathology results.

Availability of drugs and blood tests

Increase opening hours of pharmacy.

Dedicated pharmacy staff for oncology rostered everyday.

The ability to have 24 hour expiry drugs delivered on a Monday.

We have been lobbying for our chemotherapy drugs to be made the day before treatment - unsuccessful so far.

Day before blood tests.



Appendix A – Final Questionnaire

Introduction

Thank you for participating in this online survey.

This survey is designed to specifically examine the day-to-day operations of your Ambulatory Chemotherapy Unit, in order to:

- Determine the reasons that may affect the day-to-day operations in your Unit; and
- Identify solutions to overcome the various process bottlenecks.

When answering the survey questions, please note that:

A patient chemotherapy visit (PCV) is a visit by a single cancer patient, on any given day, to the Unit to receive chemotherapy.

A typical week will be the last week that, in your judgment, had a normal level of activity in your Unit

Please read through the following instructions before taking part in the survey:

- Use your mouse to "Click" the relevant circles or boxes to mark your selection;
- To move on to the next question use the scroll bar on the right hand side of your screen;
- Once you have completed a section you will need to click the "Next" Button at the foot of the page;
- You will need to answer every question to progress through the survey - if you accidentally skip a question you will be prompted to respond before you can proceed;
- In order for your answers to be sent you must click the "Submit" button at the end of the survey.

Please note: You may identify solutions at the end of the survey

About your Ambulatory Chemotherapy Unit

Q1. How many chairs are there in your Unit: _____

Q2. How many beds are there in your Unit: _____



Q3. Is your Unit located in:

1. Metropolitan
2. Regional
3. Rural
4. Remote

Q4. Is your Unit a:

1. Public Unit
2. Private Unit
3. Both

Q5. Is your Unit a dedicated cancer care unit?

1. Yes – only cancer patients are treated
2. No – other conditions are regularly treated

Q6. Please record the total number of patient presentations in your Unit on a typical week (use best estimate) for:

Planned patient chemotherapy visits: _____

Unplanned patient drop-ins: _____

Planned re-schedule patient chemotherapy visits: _____

Unplanned re-schedule patient chemotherapy visits: _____



Booking of patient/staff

Q7. Who handles the booking of patients at your Unit?

1. Administration staff
2. Nurse co-ordinator dedicated for the booking of patients
3. Treating doctor
4. Treating nurse
5. Other (Please specify)

Q8. Who is responsible for the *provision of education* to new patients?

1. Dedicated administration staff
2. Dedicated nurse educator
3. Treating doctor
4. Treating nurse
5. Other (Please specify)

Q9. Does your Unit conduct group education sessions for new patients?

1. Yes
2. No
3. Don't know/not sure

Q10. Which booking system is used?

1. Manual Diary
2. Hospital electronic outpatient booking system
3. VARIS
4. LANTIS
5. ORCIS
6. Other (Please specify)

Q11. How would you rate the effectiveness of the current process for the scheduling of patients?

1. Excellent – no improvement necessary
2. Very good – some improvement could be made
3. Good – some improvement must be made
4. Fair – substantial improvements must be made
5. Poor – the entire process must be changed



Q12. How would you rate the effectiveness of the rostering of *staff*?

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

Q13. Is your nursing staff roster flexible enough to accommodate changes to case load.

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

Q14. How often do nursing staff have access to patient medical records at the time of the treatment?

1. Always
2. Often
3. Sometimes
4. Almost never
5. Never

Q15. How are prescribing details from the treating doctors communicated to the Unit?

1. Via an electronic download
2. Through the patient
3. Through the pharmacy
4. Other (Please specify)

Communication

Q16. How would you rate the communication between your Unit and each of the following?

	Excellent	Very good	Good	Fair	Poor	Not applicable
Multi-disciplinary cancer team	5	4	3	2	1	0
Medical specialist	5	4	3	2	1	0
In-patient cancer unit	5	4	3	2	1	0
Patients' GP	5	4	3	2	1	0
Hospital pathology provider	5	4	3	2	1	0
Off site pathology provider	5	4	3	2	1	0
Hospital pharmacy	5	4	3	2	1	0
Off site pharmacy	5	4	3	2	1	0

Staff resources

Q17. What strategies does your Unit undertake to attract/retain staff?

1. Professional development opportunities
2. Mentorship programs
3. Nurse educator
4. Other (Please specify)

Q18. How often does your Unit have to:

	Always	Often	Sometimes	Almost never	Never	Not applicable
Re-schedule patient	5	4	3	2	1	0
Increase workload of existing staff	5	4	3	2	1	0
Extend operating hours	5	4	3	2	1	0

Q19. How is workload managed when:

- a) Nursing staff take planned leave (e.g. holidays, training)?
- b) Nursing staff take unplanned leave (e.g. sick, bereavement)?

Please select the most often approach (select one only) and the other approaches (multiple response accepted) in the appropriate columns.

	a) Planned leave		b) Unplanned leave	
	Most often (Select one only)	Other (Multiple response accepted)	Most often (Select one only)	Other (Multiple response accepted)
Agency services	1	1	1	1
Access pool of qualified staff within hospital	2	2	2	2
Transfer of nurses who are trained in chemotherapy from the hospital	3	3	3	3
Transfer of nurses who are <i>not</i> trained in chemotherapy from the hospital	4	4	4	4
Recruit temporary or casual nurses	5	5	5	5
Increase workload of existing Unit nurses	6	6	6	6
Re-schedule patients	7	7	7	7
Extend operating hours of patients	8	8	8	8
Other (Please specify)	9	9	9	9

Q20. How often do nursing staff work overtime?

1. Always
2. Often
3. Sometimes
4. Almost never
5. Never

Overall work processes

Q21. Thinking about the overall work processes in your Unit, would you say your Unit is:

1. Operating very effectively
2. Operating reasonably effectively
3. Operating fairly effectively
4. Operating not as effectively
5. Not operating effectively at all

Q22. Does your Unit have a Business Plan?

1. Yes
2. No
3. Currently under development
4. Don't know/not sure

Blood Test Results

Q23. What types of blood testing services are available in your Unit?

1. Internal hospital pathology service only
2. Outsourced to a private contractor only
3. Both

Q24. Please indicate the proportion of the blood tests being done on:

1. Same day: _____ %
2. Before treatment day: _____ %
- Total: 100 %

Q25. Does the Unit staff advise patients to have the blood tests done before the treatment day?

1. Always
2. Often
3. Sometimes
4. Almost never
5. Never

If 'almost never' or 'never', why almost never or never have blood tests done before the treatment day?

Q26. Can you access blood results online?

1. Yes
2. No

Q27. How often is patient scheduling affected because of delays with blood test results?

1. Always
2. Often
3. Sometimes
4. Almost never
5. Never

Q28. What are the main reasons for the delay in blood test results?

1. Insufficient patient information
2. Unplanned chemotherapy
3. Shortage of pathologists
4. Limited operating hours for pathology
5. Other (Please specify)

Pharmacy and preparation of chemotherapy agent

Q29. What types of pharmacy services are available to your Unit? (You may select more than one answer)

1. Main hospital pharmacy
2. Chemotherapy pharmacy in the Unit
3. Off site private provider
4. Other (Please specify)

Q30. How often is scheduling in your Unit affected by an inability to obtain chemotherapy agents?

1. Always
2. Often
3. Sometimes
4. Almost never
5. Never

Q31. How often do you encounter delays in receiving chemotherapy agents prepared on-site?

1. Always
2. Often
3. Sometimes
4. Almost never
5. Never
6. Chemotherapy agents not prepared on-site

Q32. What are the main reasons for the delay in the preparation of chemotherapy agents?

1. Treatment alterations are not communicated to the pharmacy in advance
2. Unplanned chemotherapy
3. Shortage of oncology pharmacists
4. Pharmacy's limited operating hours
5. Chemotherapy agents not stored on site
6. Incomplete prescription by doctor
7. Other (Please specify)
8. Not applicable

Other issues affecting the operation of the Unit

Q33. Below is a list of issues that may or may not affect your Unit. For each statement, please indicate whether it affects your Unit a lot or not at all?

	A lot					Not at all				
	1	2	3	4	5	1	2	3	4	5
Physical space	1	2	3	4	5	1	2	3	4	5
Complexity of treatment regime	1	2	3	4	5	1	2	3	4	5
Extended consultant time	1	2	3	4	5	1	2	3	4	5
Increase in new patient visits	1	2	3	4	5	1	2	3	4	5
Management of patients from non English speaking background	1	2	3	4	5	1	2	3	4	5
Management of patients from Indigenous background	1	2	3	4	5	1	2	3	4	5
Management of the highly infectious patients (e.g. MRSA)	1	2	3	4	5	1	2	3	4	5
Management of unplanned presentations (drop-ins)	1	2	3	4	5	1	2	3	4	5
Shortage of staff resources	1	2	3	4	5	1	2	3	4	5
Booking of patients	1	2	3	4	5	1	2	3	4	5
Technical failures (such as computer system)	1	2	3	4	5	1	2	3	4	5
Lack of communication with pharmacy	1	2	3	4	5	1	2	3	4	5
Delay in pharmacy drugs	1	2	3	4	5	1	2	3	4	5
Delay in blood test results	1	2	3	4	5	1	2	3	4	5
Delay in radiology/radiological scan results	1	2	3	4	5	1	2	3	4	5
Lack of patient education	1	2	3	4	5	1	2	3	4	5

Q34. Please specify any other issues that have affected the function of your unit.

Q35. What would you suggest can be done to improve the effectiveness of service delivery for your Unit?

Q36. Lastly, please type in the full name of your Ambulatory Unit.

This is for us to monitor the progress of the survey and help sending email reminders to those who haven't responded. The answers you provided will not be linked to your Unit.

Appendix B – PAL sent to Nurse Unit Managers

Cancer Institute NSW's Letterhead

Date

Name

Nurse Unit Manager

Ambulatory Chemotherapy Unit

Postal Address

Suburb State Postcode

Dear Nurse Unit Manager

Re: A Survey of Ambulatory Chemotherapy Units in NSW

The Cancer Institute NSW has commissioned Campbell Research & Consulting (**CR&C**) to conduct a survey with Nurse Unit Managers (**NUMs**) of the ambulatory chemotherapy units across NSW (inclusive of ACT).

In November 2005, Cancer Institute NSW conducted a review of all outpatient chemotherapy and haematology activity (**the 2005 review**). The 2005 review identified current service delivery and provided baseline data for future initiatives to develop increased capacity and improve the delivery of chemotherapy in ambulatory care settings within current budget.

The survey

As part of the Cancer Institute NSW's commitment to develop a strategic business improvement program for ambulatory care services across NSW, Cancer Institute NSW wishes to undertake a *short* survey with NUM from all ambulatory chemotherapy units in NSW. Your contribution to the survey will help us provide advice to the Area Health Services and NSW Health on methods to improve business efficiency.

This survey is built on the 2005 review and will focus on patient scheduling, staff mix/training/pathology, pharmacy, and the challenges (if any) you encountered at your unit. The survey will be conducted online by CR&C. The online approach has been used to maximise convenience for you. However, if this does not work for you, please contact April Yik from CR&C on (03) 9482 4216 to discuss about other participation options.

The survey period is 3rd to 30th September, 2008. We strongly urge all NUMs to complete the survey.

The outcomes from this research will help Cancer Institute NSW to provide advice to the Area Health Services and NSW Health on methods to improve business efficiency. Your contribution is important and will make a difference.



Confidentiality and privacy

CR&C is a member of the Association of Market & Social Research Organisations (AMSRO) and is bound by the Market and Social Research Privacy Principles and, in addition, abides by the principles of the Australian Market and Social Research Society's (AMSRS) Code of Professional Behaviour. Your decision to participate in this survey is entirely voluntary. If you choose to participate, any information that you provide will remain confidential.

Accessing the survey

The Cancer Institute NSW strongly urges all NUMs to please participate in this important survey.

In addition to this letter, CR&C will send you an email invitation to participate in the online survey. You could also visit CR&C's website www.campbellresearch.com.au and follow the link in the *Latest news*' section to access the online survey.

If you have queries relating to Cancer Institute NSW business improvement program, please contact Penny Adams (Manager, Models of Care) at Penny.ADAMS@cancerinstitute.org.au or on (02) 8374 5713. If you have any questions regarding the survey, please contact April Yik (Research Manager) at ayik@campbellresearch.com.au or on (03) 9482 4216.

Yours sincerely

Sue Sinclair

Director, Cancer Services and Education

Cancer Institute NSW



Appendix C – PAL sent to Directors & CEOs

Cancer Institute NSW's Letterhead

Date

Name

Director or CEO

Health organisation

Postal Address

Suburb State Postcode

Dear Directors/CEOs

Re: A Survey of Ambulatory Chemotherapy Units in NSW

We are writing to seek your help with a survey that we would like to conduct with a Nurse Unit Manager (**NUM**) from the ambulatory chemotherapy unit at your health organisation in September 2008. Campbell Research & Consulting (**CR&C**) has been commissioned by Cancer Institute NSW to conduct this survey. Our primary aim is to provide information on capacity and to evaluate the units' work efficiency as they are faced with increased workload.

In November 2005, Cancer Institute NSW conducted a review of all outpatient chemotherapy and haematology activity (**the 2005 review**). The 2005 review identified current service delivery and provided baseline data for future initiatives to develop increased capacity and improve the delivery of chemotherapy in ambulatory care settings within current budget.

As part of the Cancer Institute NSW's commitment to develop a strategic business improvement program for ambulatory care services across NSW, Cancer Institute NSW wishes to undertake a *short* survey with NUMs from all ambulatory chemotherapy units in NSW (inclusive of ACT). This survey will help us provide advice to the Area Health Services and NSW Health on methods to improve business efficiency.

This survey is built on the 2005 review and includes questions about patient scheduling, staff mix/training/pathology, pharmacy, and any other challenges the NUM encountered at the unit. The survey will be conducted online by CR&C.

The survey period is 3rd to 30th September, 2008.

We hope that you would support and encourage the NUM at the ambulatory chemotherapy unit to participate in the survey. The outcomes from this research will help Cancer Institute NSW to suggest ongoing improvement to the delivery of ambulatory chemotherapy in NSW. The NUM's contribution and the cooperation of the Area Health Service is needed to successfully provide advice to you.

Confidentiality and privacy

No individuals or organisations will be identified in the survey report. Further information about CR&C's privacy policy is available on their website:

<http://www.campbellresearch.com.au/Privacy.aspx>



If you have queries relating to Cancer Institute NSW business improvement program, please contact Penny Adams (Manager, Models of Care) at Penny.ADAMS@cancerinstitute.org.au or on (02) 8374 5713. If you have any questions regarding the survey, please contact April Yik (Research Manager) at ayik@campbellresearch.com.au or on (03) 9482 4216.

Yours sincerely

Sue Sinclair
Director, Cancer Services and Education
Cancer Institute NSW



Appendix D – Email Invitation

Dear XXXX

Re: Invitation to participate in a Survey of Ambulatory Chemotherapy Units in NSW

Campbell Research & Consulting (CR&C) is conducting a review of the delivery of chemotherapy in ambulatory care settings. The survey has been commissioned by the Cancer Institute NSW.

The Cancer Institute NSW recently sent a letter to inform you about this survey being undertaken by CR&C.

The survey

This survey is being conducted with Nurse Unit Managers (**NUMs**) from the 83 ambulatory chemotherapy units across NSW. It is important for us to provide the opportunity to you as a representative from your unit to participate in the survey. Your contribution to the survey will help the Cancer Institute NSW to provide advice to the Area Health Services and NSW Health on methods to improve processes..

Please click on this link to start the online survey:

<http://survey.campbellresearch.com.au/survey.asp?r=800865&vp=96d35b4b17>

The online approach has been used to maximise convenience for you. However, if this does not work for you, please contact April Yik from CR&C on (03) 9482 4216 to discuss other participation options. **The survey period is 3rd to 30th September, 2008.** We strongly urge all Nurse Unit Managers to participate in the survey.

Confidentiality and privacy

No individuals or organisations will be identified in the survey report. Further information about CR&C's privacy policy is available on our website:

<http://www.campbellresearch.com.au/Privacy.aspx>

Further information

If you have queries relating to Cancer Institute NSW Business Improvement Program, please contact Penny Adams (Manager, Models of Care) at penny.adams@cancerinstitute.org.au or on (02) 8374 5713. If you have any questions regarding the survey, please contact April Yik (Research Manager) at ayik@campbellresearch.com.au or on (03) 9482 4216.

Yours sincerely

Stephen Campbell
Managing Director
Campbell Research & Consulting

