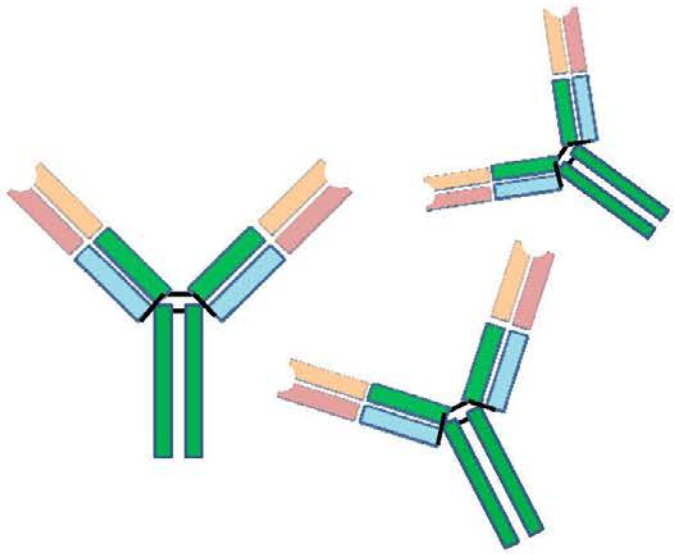
National Blood Authority
Australia

National Report on the Issue and Use of Intravenous Immunoglobulin (IVIg) 2010-2011



Saving & improving Australian lives through a world-class blood supply

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This report is available online at <http://www.nba.gov.au/ivig/index.html>

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1. EXECUTIVE SUMMARY

Demand for Intravenous Immunoglobulin (IVIg) continues to increase, although the rate of increase appears to be slowing. The average annual growth from 2003/04 to 2010/11 was 11.6% per annum and the growth from 2009/10 to 2010/11 was 11.1%. Product issued (grams per 1000 head of population) grew by 10.3% in 2010/11 compared to 10.5% in 2009/10

In 2010/11 2,950,371g (total) of IVIg was issued representing a cost of $149.4 million nationally (excluding cost of plasma collections). Of this total, 86% was domestically produced and 14% was imported. This equates to 2,533,698g of domestic IVIg and 416,673g of imported IVIg. A total of 11,457 patients were issued IVIg nationally under the national blood arrangements and there were 93,887 associated patient episodes[1].

While there is guidance in the Criteria for the Use of Intravenous Immunoglobulin in Australia[2] (*the Criteria)* considerable variation remains in the grams issued per treatment episode across the jurisdictions for some conditions. The criteria are due to be updated by mid-2012.

Neurology remains as the discipline using the greatest amount of IVIg and demand in this discipline grew by 14.1% in 2010/11. Haematology is the next largest user of IVIg. Growth had declined in Immunology as the third largest user of IVIg in 2009/10 but increased again in 2010/11 from 1.7% to 6.8%.

In 2010/11 the top three indications for which most IVIg was issued are;

- acquired hypogammaglobulinaemia secondary to haematological malignancies (21.2%)
- chronic inflammatory demyelinating polyneuropathy (CIDP, 20.1%)
- primary immunodeficiency diseases (PID, 15.6%).

[1] A treatment episode is a treatment involving the infusion of IVIg on a particular day. An approval may authorise a series of treatment episodes spanning some months.

[2] Jurisdictional Blood Committee, for and on behalf of the Australian Health Minister's Conference. Criteria for the Use of Intravenous Immunoglobulin in Australia. Canberra, Commonwealth of Australia, 2007.
Available at <http://www.nba.gov.au/ivig/index.html>

2. PURPOSE

The purpose of this report is to document the trends in the demand for, and cost of, IVIg in 2010/11 and provide insights into the drivers of demand. The report draws on data held by the National Blood Authority (NBA) on the volumes of IVIg issued (issues) and the recorded purchases. Information is also sourced from the Australian Red Cross Blood Service (Blood Service) STARS database which is maintained by the Blood Service on behalf of all Australian governments in their role as contracted gatekeeper and distributer of IVIg products. The report aims to provide stakeholders with meaningful detail on IVIg demand to assist in informed decision making. Major stakeholders include patients, clinicians, other health professionals and administrators, and governments.

3. INTRODUCTION AND CAVEATS

This report provides an overview of volume of IVIg issued in Australia. The report summarises product issued over time and provides detail on issues within the 2010/11 financial year. The report focuses on IVIg which has been funded by the National Blood Authority under the National Blood Agreement, but also provides limited data on IVIg supplied under Direct Orders (DOs) which are paid for directly by state or hospital arrangements.

The report provides information at the national, and where appropriate, jurisdictional levels. Information is provided on patient volumes, the grams per 1000 head of population, average dose and number of treatment episodes by condition.

It should be noted that *the Criteria* was introduced in March 2008 with a transition period extending to the end of September 2008, or in some particular cases, longer. Diagnoses and indications captured prior to the implementation of *the Criteria* were mapped to ensure that they were meaningfully represented, however information from previous years may not be directly comparable from 2008/09 forward.

Care should be taken when interpreting the data relating to the smaller jurisdictions as these can be overly influenced by one or two patients.

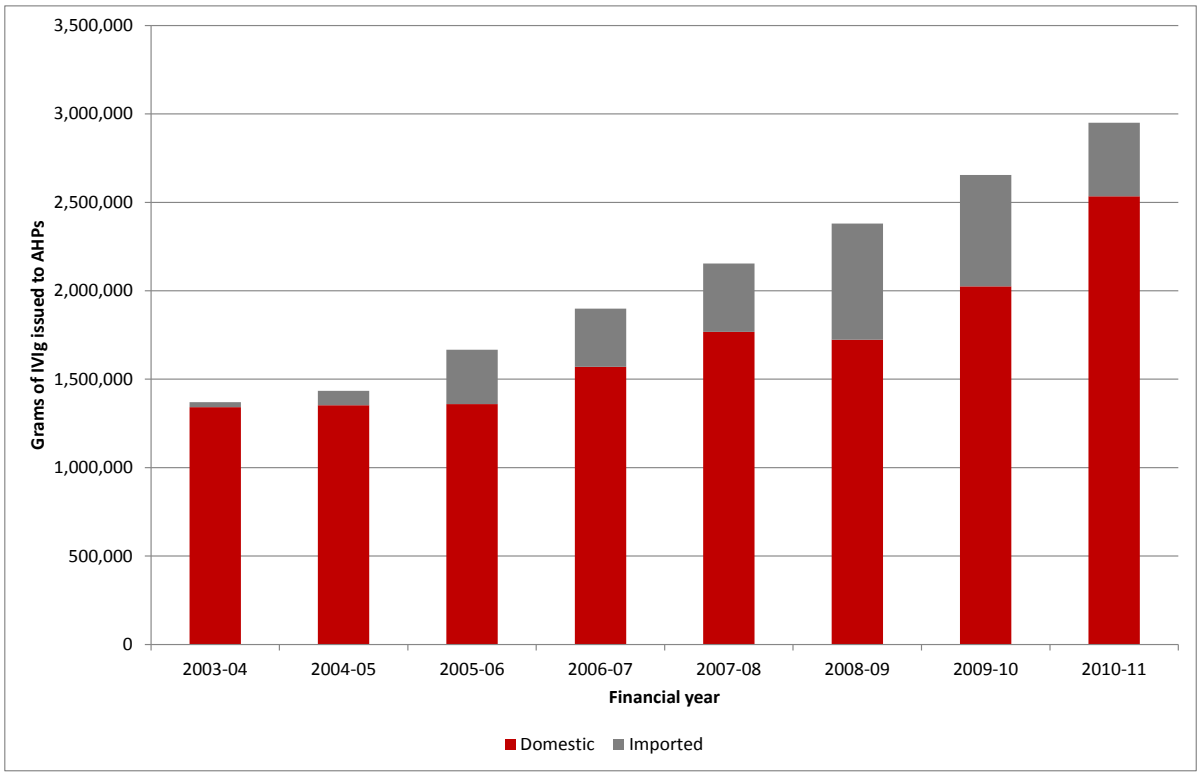
The reporting period covers Quarter One 2008/09 to Quarter Four of the 2010/11 financial years.

The information for this report is gathered from the national Blood Service Supply Tracking Analysis Recording System (STARS) database, which is then reconciled by the NBA against the Integrated Data Management System (IDMS) system for contract management, blood and blood product invoice validation and supply management and planning, and Big Red (the data warehouse and reporting solution for all NBA systems, with end users in the NBA and in jurisdictions).

4. TRENDS IN ISSUES OF IVIG - 2003/04 TO 2010/11

The total volume of IVIg issued under the National Blood Arrangements continued to increase during 2010/11 (Figure 1). A total of 2,950,371g were issued nationally in 2010/11 - an increase of 295,186g over 2009/10. Of this total, 14% was imported product.

Figure 1 IVIg issued (grams) nationally 2003/04 to 2010/11



Source: IDMS database of issues via Big Red

However, the increase in growth nationally is lower than in previous years, suggesting the rate is slowing (Table 1 below).

Table 1 Growth in total IVIg issues from 2003/04

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Growth from previous year	4.7%	16.2%	13.9%	13.5%	10.5%	11.6%	11.1%
Average growth from 2003/04	4.7%	10.3%	11.5%	12.0%	11.7%	11.7%	11.6%

Source: IDMS database of issues via Big Red

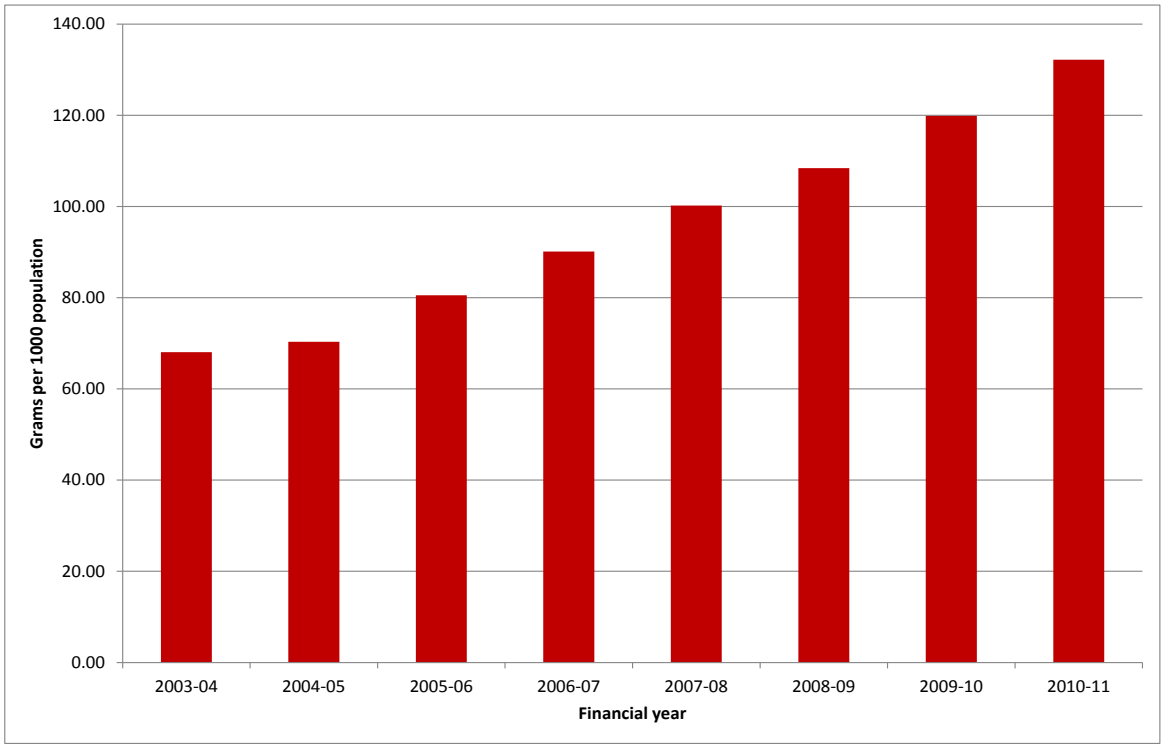
Average growth is the fixed rate of growth each year that would accumulate from 2003/04 to give the year's value.

It is obtained by the formula $\sqrt[n-m]{\frac{V_n}{V_m}} - 1$; where V_n = volume in year n

Figure 2 and Table 2 show issues of total IVIg and growth presented by 1000 head of population, with the rate growing from 119.86g per 1000 head of population in 2009/10 to 132.21g in 2010/11. The increase in issues per head of population continues to be higher than population growth.

It is likely that some of the growth (in per capita terms) of IVIg use relates to the ageing of the Australian population and the strong correlation between ageing and conditions that are treated with IVIg.

Figure 2 Grams of IVIg issued per 1000 head of population nationally



Source: IDMS database of issues via Big Red and ABS Estimated resident population (ABS 3101.0)

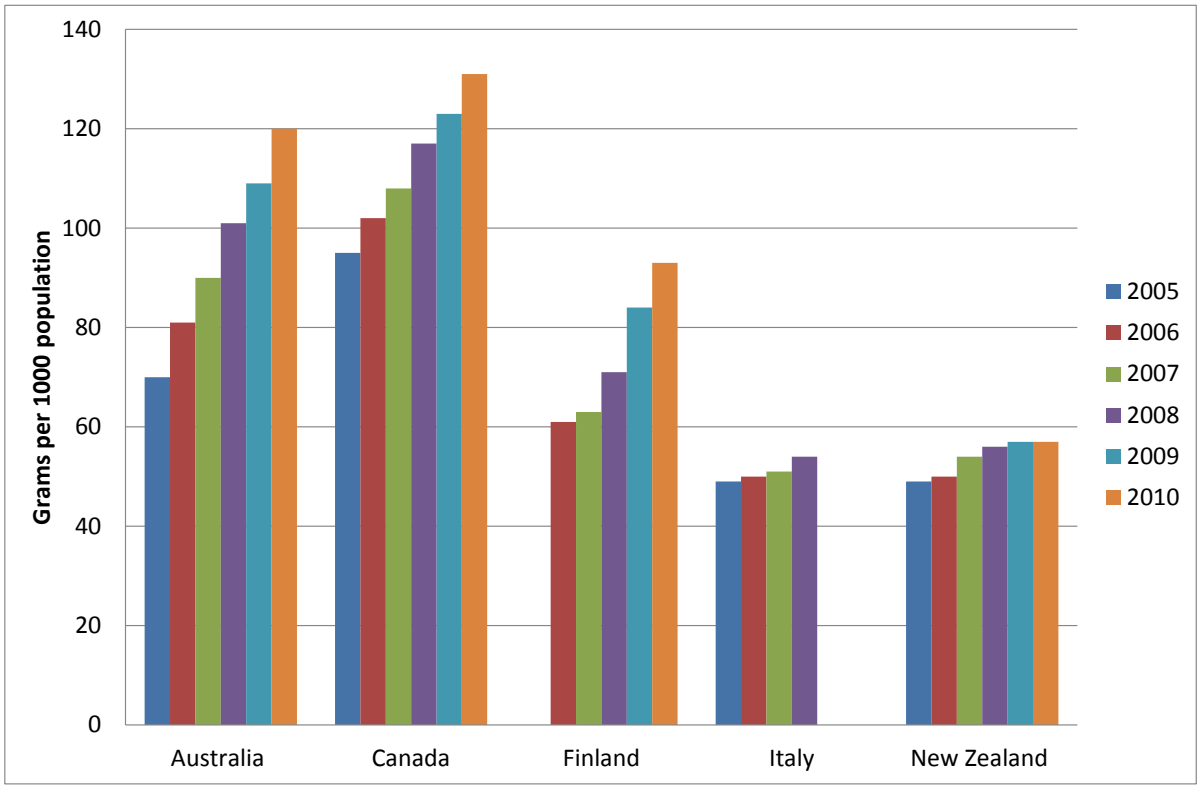
Table 2 IVIg issues (grams per 1000 head of population) nationally and percentage change from previous year

Year of issue	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Issue of IVIg (g/1000 pop)	68.06	70.34	80.54	90.11	100.21	108.42	119.86	132.21
Increase by year		3.3%	14.5%	11.9%	11.2%	8.2%	10.5%	10.3%

Source: IDMS database of issues via Big Red

When compared to other international benchmarking, Australia's use of IVIg per capita continues to be high (Figure 3).

Figure 3 International IVIg use (grams per 1000 population) selected countries 2005 to 2010



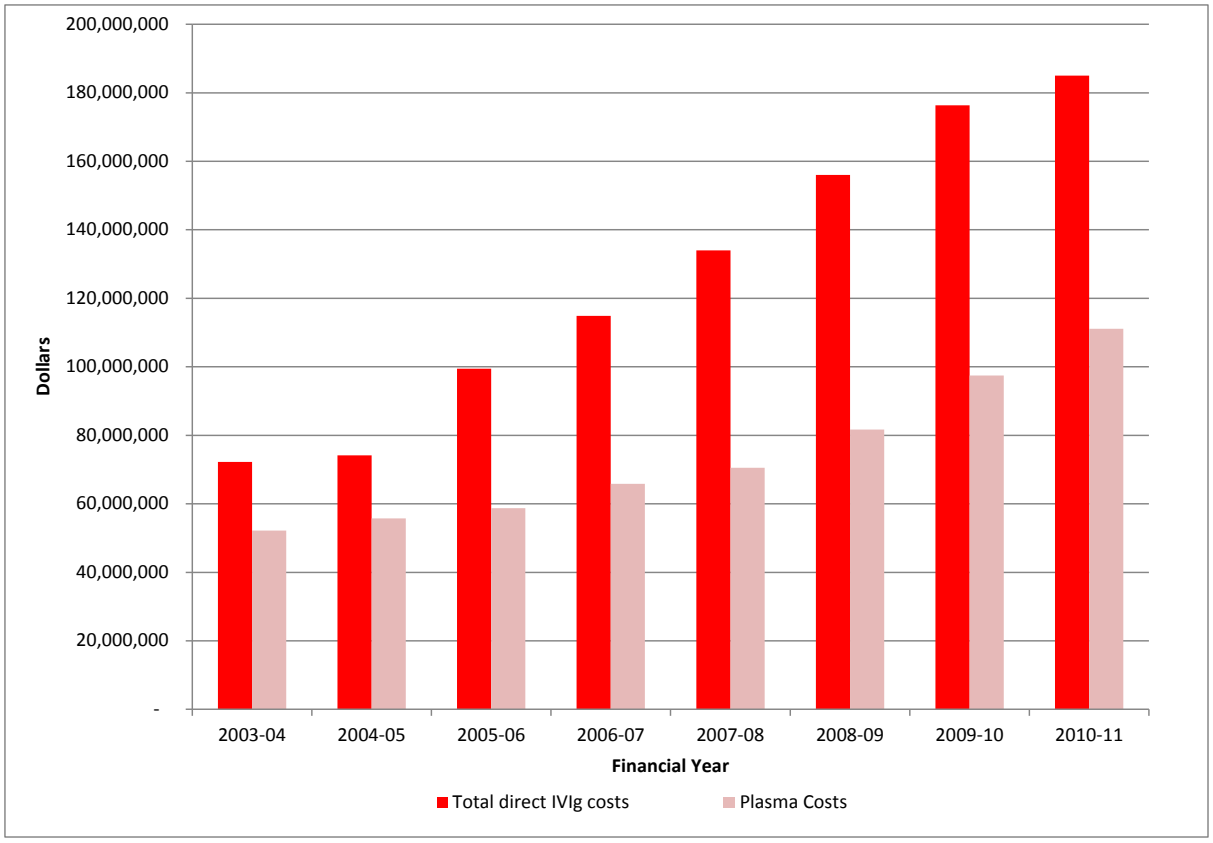
Source: Data prepared for presented at National Plasma Product Supply Planners (NPPSpa), 2010

5. TRENDS IN COSTS 2003 - 2011

Figure 4 shows the increased cost of the provision of IVIg under the National Blood Arrangements over time. Total issue costs of IVIg in 2010/11 was, $185 million, an increase of $113 million from 2003/04. On average IVIg issue costs have grown around 15% while average demand growth was 11.6% since 2003/04. The NBA has over the past eight years achieved savings on prices for both imported and domestic IVIg. In 2010/11 the cost increase over 2009-10 was only 5% while demand volume increase was 11%

With the introduction of the new CSL Ltd. contract arrangements on 1 January 2009 the direct price per gram of domestic IVIg fell. The lighter bars indicate the total cost of plasma collection. Plasma collection costs have increased from 2003/04 at $52 million to $111 million in 2010/11, this is an average growth of 11.5% during this time. The average increase of plasma collection volumes during the same time was 7%.

Figure 4 Cost of IVIg from 2003/04 to 2010/11



Source: IDMS database of purchases via Big Red

5.1. PLASMA COSTS

The Blood Service collected 472 tonnes of plasma for fractionation; 95% of this was used to produce domestic IVIg (Intragam P) and the remaining 5% was used for other hyperimmune products.

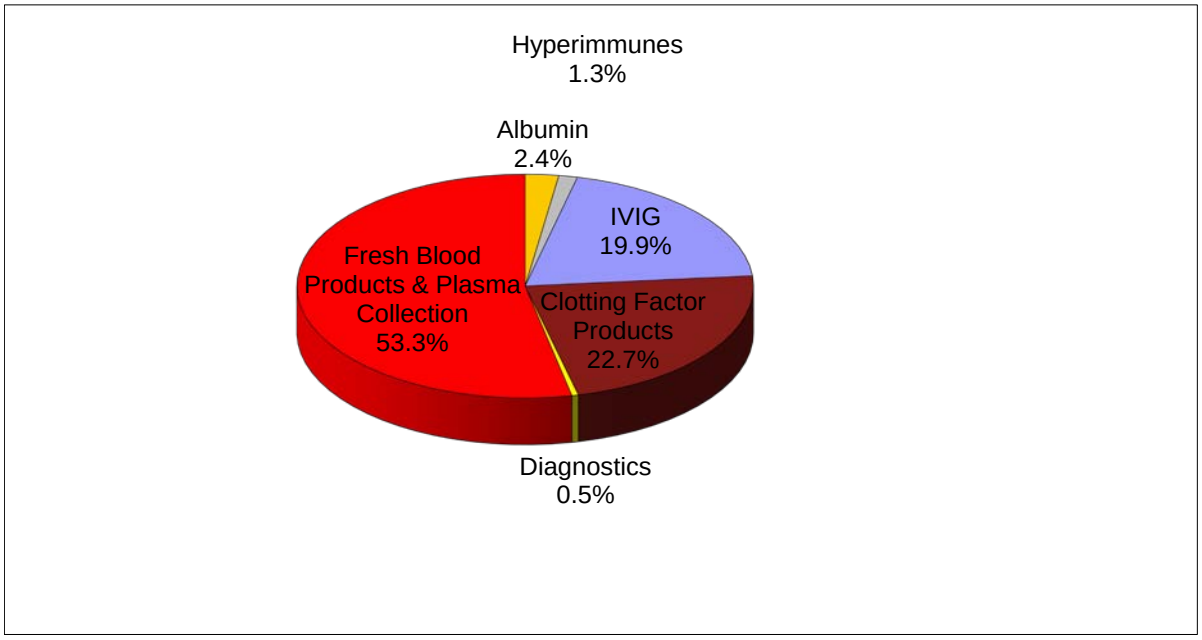
The fractionation process is a serial extraction process, and after each production step further products may also be produced from the residual plasma. Factor VIII is obtained from cryoprecipitate. Factor IX and Prothrombin complex are next precipitated from residual plasma after the removal of the cryoprecipitate. The next group of products precipitated are the immunoglobulins (IVIg and hyperimmunes). Finally albumin is extracted from the residual plasma. This means that not all the above plasma collection costs can be allocated to IVIg.

The cost of plasma is paid separately by jurisdictions based on their use of domestic IVIg.

5.2. SHARES OF TOTAL BLOOD PRODUCT BUDGET

Figure 5 illustrates the proportional cost of IVIg within the blood budget overall. IVIg is the third largest budget contributor and represents almost 20% of the total budget for blood and blood products.

Figure 5 Share of total expense 2010/11



Source: NBA Reporting systems 2010/11

6. TRENDS IN USE

Since the introduction of *the Criteria*, IVIg data is often summarised by the chapter of *the Criteria* in which IVIg use is controlled for various conditions. The chapters described in *the Criteria* are:

- chapter 5, conditions for which IVIg has an established therapeutic role
- chapter 6, conditions for which IVIg has an emerging therapeutic role
- chapter 7, conditions for which IVIg has application in exceptional circumstances only
- chapter 8, conditions for which IVIg use is not indicated.

6.1. USE BY CHAPTER

Table 3 and Table 4 outline the volume of IVIg issued (grams) per chapter. It should be noted that prior to 2008, data has been mapped to the current chapters, therefore may not be directly comparable. As would be expected, the highest amount of IVIg issued is for indications within chapter 5, those for which IVIg has an established therapeutic role.

Table 3 IVIg issued (grams) by chapters in the Criteria

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Chapter 5	1,005,594	1,172,728	1,363,847	1,625,246	1,990,586	2,212,914	2,505,332
Chapter 6	402,416	400,682	368,458	417,939	345,176	371,832	397,231
Chapter 7	17,820	19,518	33,970	45,130	47,275	61,924	76,033
Chapter 8	13,110	16,259	15,351	8,888	3,326	2,550	2,574
Direct orders	0	0	0	280	0	243	215
Not in current classification	43,056	47,730	76,426	37,743	0	0	0

Source: IVIg Stars database maintained by the Blood Service.

Table 4 IVIg issued (% total) by chapters in the Criteria

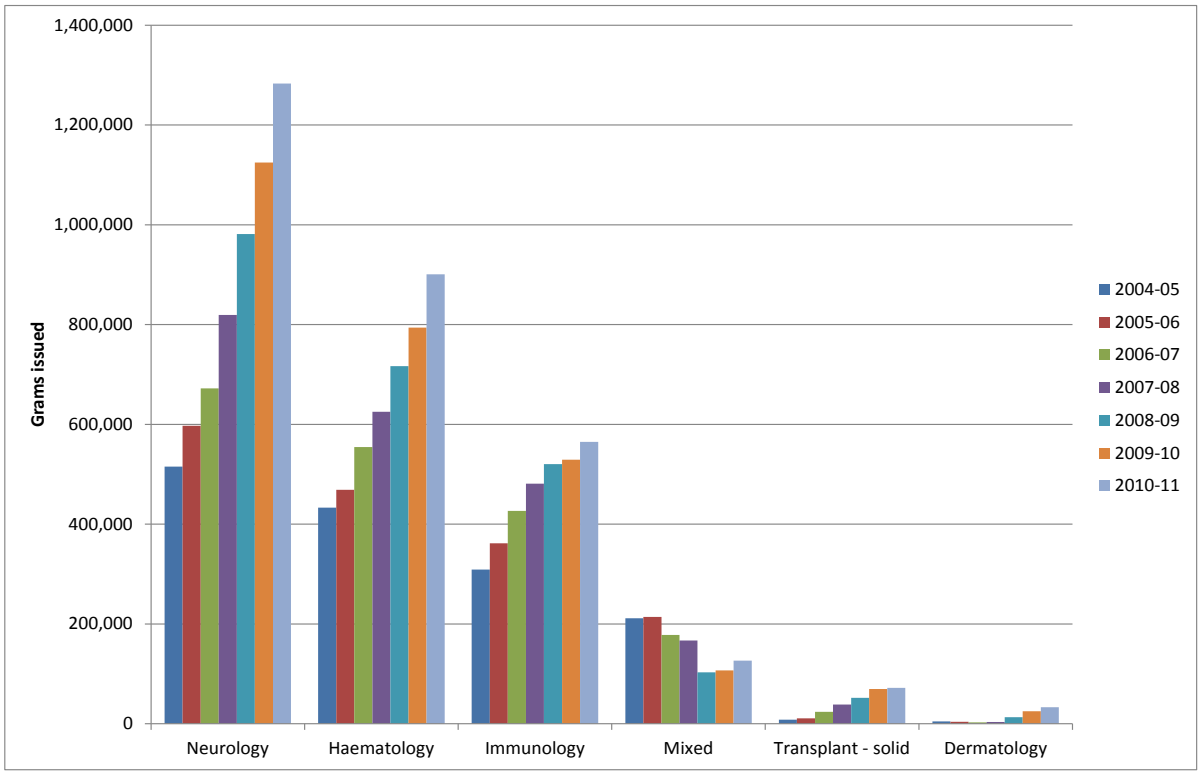
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Chapter 5	68%	71%	73%	76%	83%	84%	84%
Chapter 6	27%	24%	20%	20%	14%	14%	13%
Chapter 7	1%	1%	2%	2%	2%	2%	3%
Chapter 8	1%	1%	1%	0%	0%	0%	0%
Direct orders	0%	0%	0%	0%	0%	0%	0%
Not in current classification	3%	3%	4%	2%	0%	0%	0%

Source: IVIg Stars database maintained by the Blood Service.

6.2.USE BY DISCIPLINE

In 2010/11, in line with previous years, volumes of IVIg ordered were greatest for the disciplines of neurology, haematology and immunology (Figure 6 and Table 5). Neurology demand grew by 14.1% in 2010/11. Haematology demand grew by 13.4%. Rate of growth in Immunology slowed to an increase of 1.7% between 2008/09 and 2009/10, but the rate of growth increased again in 2010/11 to 6.8%. The category of "mixed" discipline represents conditions that may be treated by clinicians from more than one medical discipline.

Figure 6 IVIg issued (grams) by discipline over time



Source: IVIg Stars database maintained by the Blood Service.

Note: Mixed indicates where a treatment has commenced in one discipline before being re categorised as a further discipline.

Table 5 IVIg issued (grams) by discipline by year

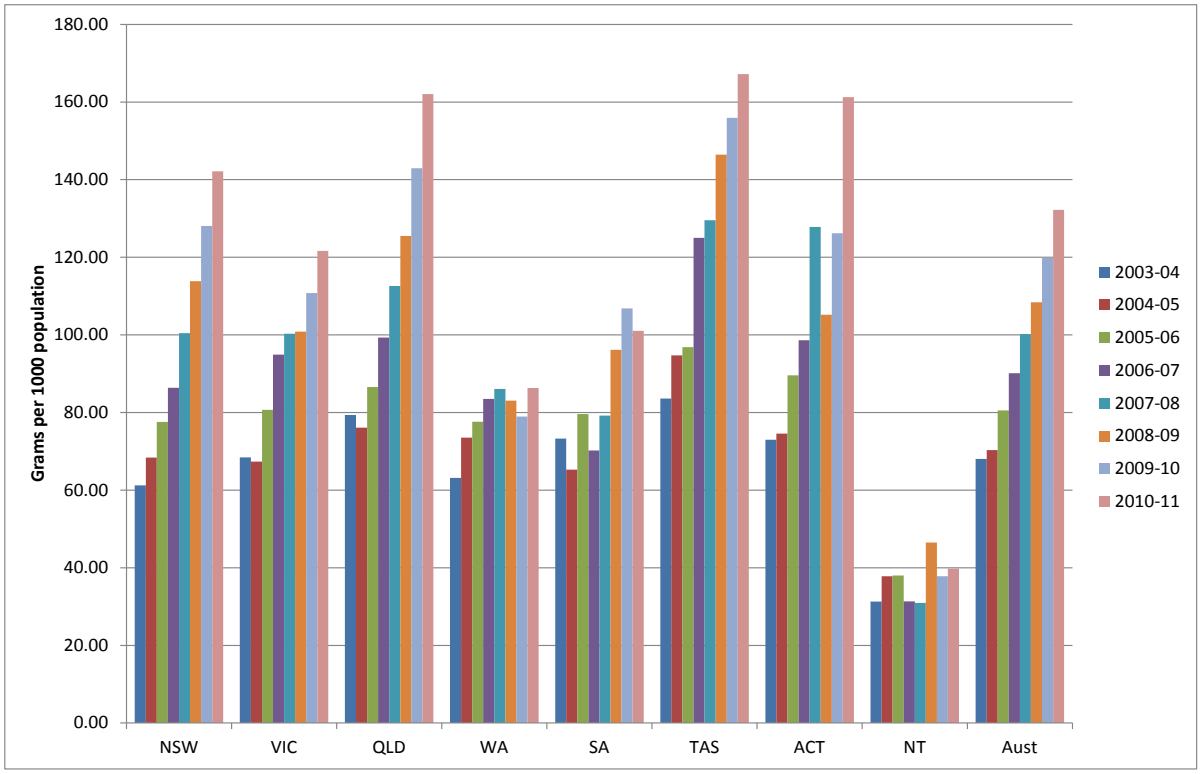
Discipline	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Neurology	515,403	597,393	672,045	819,505	981,372	1,124,604	1,283,190
Haematology	433,247	468,756	554,499	625,304	716,767	794,098	900,826
Immunology	308,999	361,821	426,687	481,177	520,264	529,132	565,064
Mixed	211,459	214,221	178,124	166,942	102,937	106,884	126,619
Transplant - solid	8,031	10,793	23,788	38,524	51,940	69,561	72,149
Dermatology	4,857	3,933	2,909	3,774	13,083	24,943	33,324

Source: IVIg Stars database maintained by the Blood Service.

6.3. USE PER 1000 HEAD OF POPULATION

National and jurisdictional IVIg issues per 1000 head of population for the last eight years are presented in Figure 7. Tasmania, Queensland, New South Wales and the ACT continue to have issues per head of population above the national rate, while the other jurisdictions are below the national rate. It should be noted that rates for the smaller population jurisdictions must be viewed with some caution. WA and the NT have remained reasonably stable in terms of the issues per 1000 population, SA has had significant variability and all other jurisdictions have seen a continued strong increase in the issues per 1000 population.

Figure 7 IVIg issues by state by head of 1000 population over time



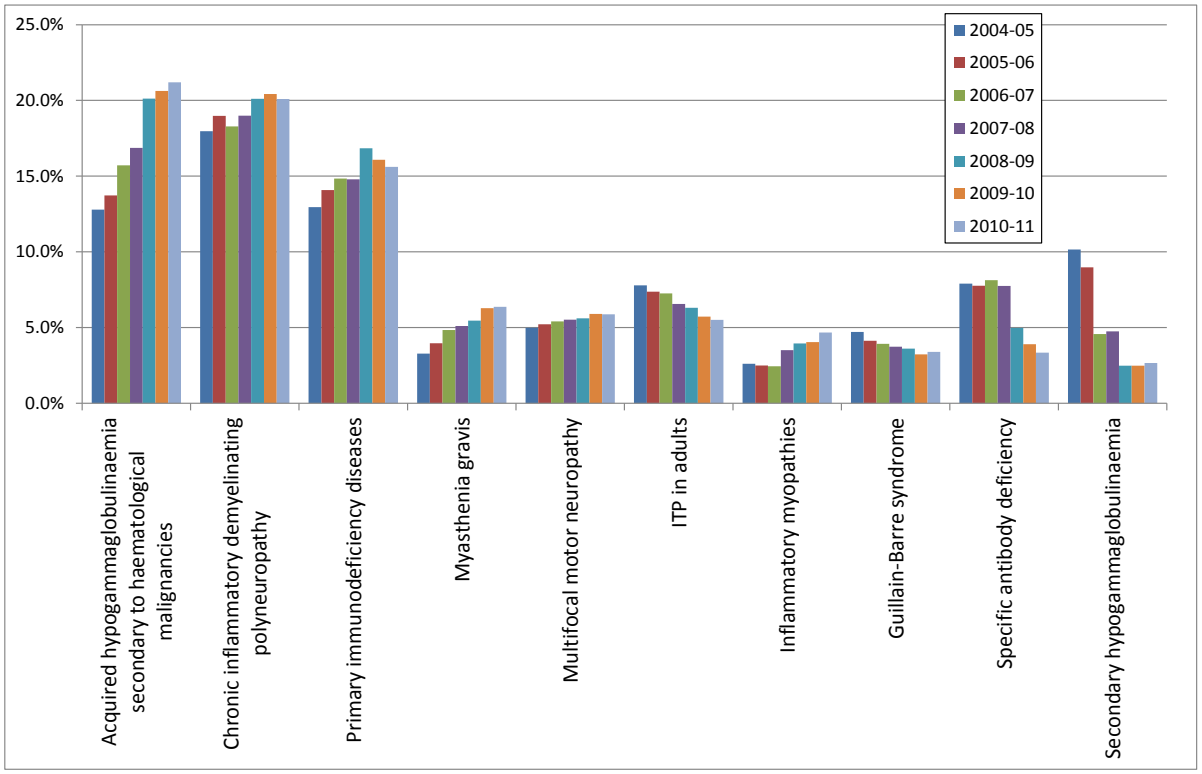
Source: NBA IDMS issues data.

6.4.USE BY DIAGNOSIS

The Blood Service is required to collect information on diagnosis and indication for use. The largest group of primary diagnoses for which IVIg was issued has changed over time and is presented in Figure 8.

Acquired hypogammaglobulinaemia secondary to haematological malignancies are the primary diagnoses for which the greatest percentage of IVIg was issued in 2010/11 (21.2%) closely followed by CIDP (20.1%). PID accounted for 15.6% of total IVIg use.

Figure 8 Disease grouping to which the highest percentages of IVIg was issued nationally



Source: IVIg Stars database maintained by the Blood Service. These disease groups are all in Chapter 5.

7. 2010/11 IN REVIEW

The following sections in the report provide more detailed information on IVIg demand in 2010/11.

7.1. SUMMARY INFORMATION

In 2010/11, STARS recorded 2,981,170g of IVIg while the NBA's Integrated Data Management System (IDMS) recorded 2,950,371g of IVIg issued nationally. The latter represented a cost of $149.4 million. Of these 2,533,698g were domestic IVIg (86%) and 416,673g (14%) imported IVIg. A total of 11,457 patients were issued IVIg under the National Blood Arrangements for 93,887 patient episodes. This excludes patients who received IVIg by DOs.

Table 6 Annual numbers of patients, treatments and grams recorded in STARS

Year	Number of patients	Number of treatment episodes	Total grams issued
2008/09	9,832	77,212	2,386,361
2009/10	10,502	85,291	2,649,220
2010/11	11,457	93,887	2,981,170

Source: IVIg Stars database maintained by the Blood Service.

7.2. TOTAL ISSUES AND EXPENDITURE

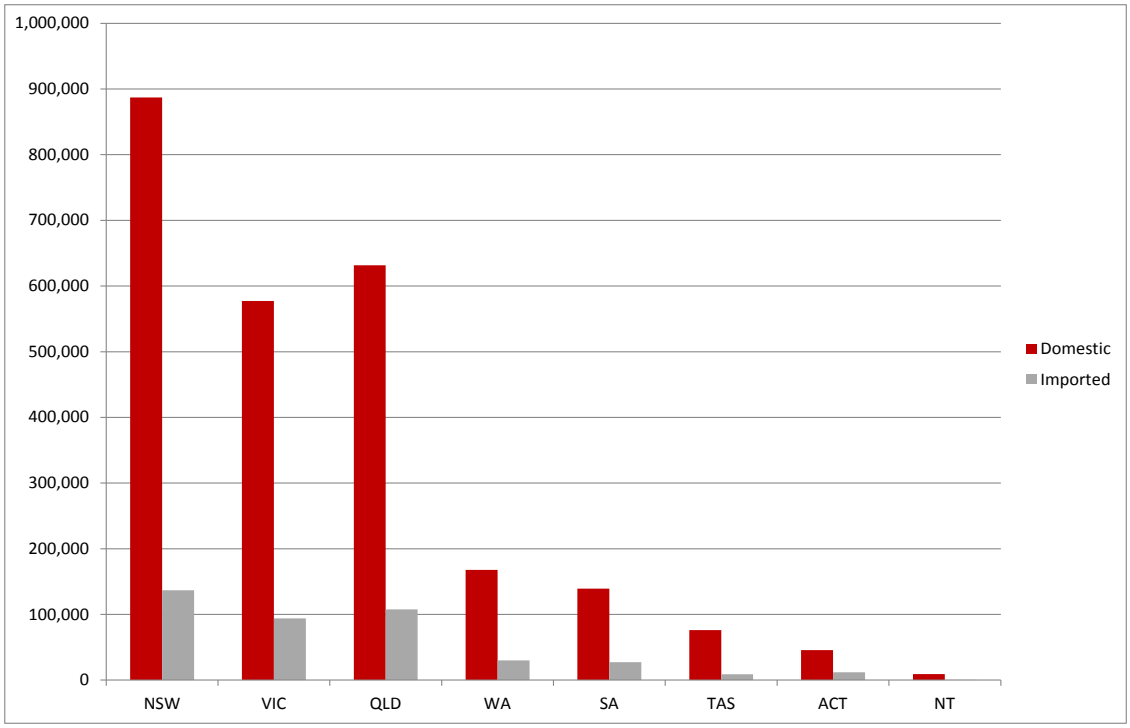
Table 7 shows the total grams of IVIg issued in 2010/11 by jurisdiction, while Figure 9 depicts the jurisdictional issues in a graphical form. Nationally in IDMS, the total amount was 2,950,371g, with issues increasing with population size of the jurisdiction, as expected. The amounts captured in STARS are presented in Table 8.

Table 7 Grams IVIg issued by jurisdiction 2003/04 to 2010/11

		NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT
2003/04	Domestic	410,505	318,762	306,639	125,094	110,031	40,353	23,895	6,321
	Imported	0	22,200	3,000	144	2,856	0	0	0
2004/05	Domestic	420,858	326,130	284,043	148,200	95,403	46,065	24,615	7,806
	Imported	41,376	13,860	19,992	144	5,922	0	0	0
2005/06	Domestic	452,565	361,665	219,633	152,127	109,515	33,837	21,774	8,004
	Imported	76,368	52,097	134,475	7,765	15,300	13,608	8,165	0
2006/07	Domestic	493,172	407,244	337,301	155,821	92,958	50,583	26,470	6,732
	Imported	103,270	88,398	79,393	20,577	18,375	11,065	7,170	0
2007/08	Domestic	599,126	423,170	400,144	148,986	108,596	52,755	27,393	6,825
	Imported	105,633	111,010	85,055	38,445	18,416	11,740	16,875	0
2008/09	Domestic	562,320	417,574	383,865	143,628	128,511	53,745	22,841	10,503
	Imported	249,905	131,228	171,367	42,895	27,604	19,965	14,200	0
2009/10	Domestic	668,526	507,038	439,089	162,963	143,285	61,686	33,225	8,610
	Imported	252,416	101,930	200,264	16,248	31,244	17,110	11,550	0
2010/11	Domestic	887,016	577,260	631,545	167,745	139,296	76,197	45,540	9,099
	Imported	136,728	93,835	107,798	30,108	27,383	8,843	11,900	80

Source: IDMS database of issues via Big Red.

Figure 9 Total grams of IVIg issued by jurisdiction 2010/11



Source: IDMS database of issues via Big Red.

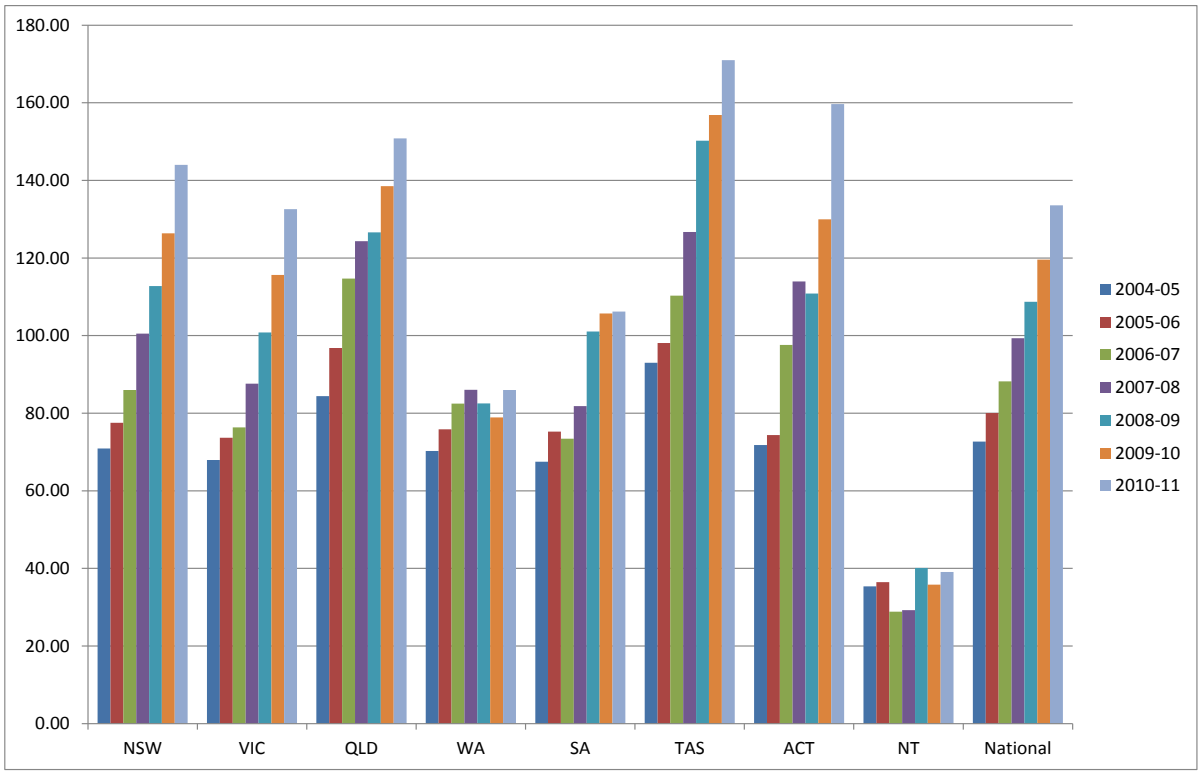
Table 8 IVIg issued as recorded in STARS for 2010/11

State	Grams issued	Proportion of total issues	Proportion of Australian population	Grams per 1000 population
NSW	1,037,032	34.8%	32.3%	144.00
Vic.	688,031	23.1%	24.7%	124.74
Qld.	731,215	24.5%	20.4%	160.28
WA	197,117	6.6%	10.3%	86.00
SA	175,128	5.9%	7.4%	106.18
Tas.	86,971	2.9%	2.3%	170.98
ACT	56,871	1.9%	1.6%	159.65
NT	9,021	0.3%	1.0%	39.10
Total	2,981,385	100.0%	100.0%	133.59

Source: IVIg Stars database maintained by the Blood Service. ABS population statistics.

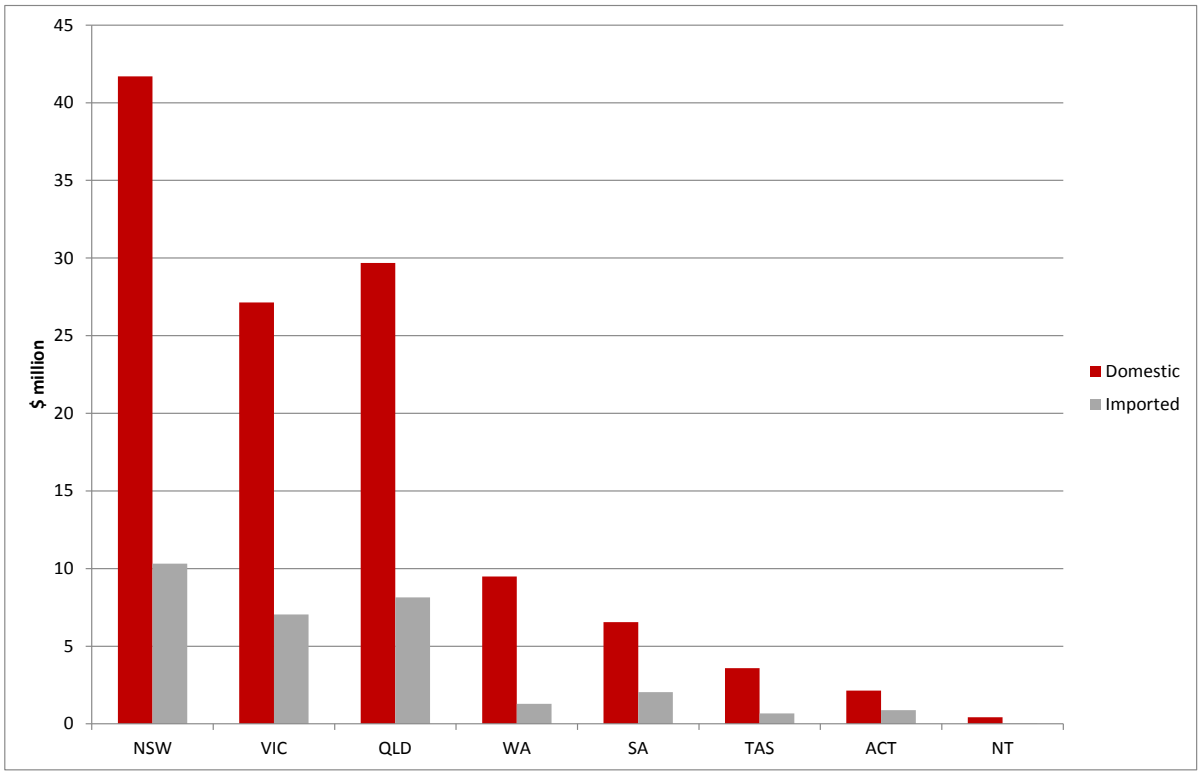
The 2010/11national average of IVIg issued (grams per 1000 head of population) is 133.59g according to the data recorded in the STARS database. Figure 10 presents the STARS information by jurisdiction. New South Wales, Queensland, Tasmania and the ACT received issues per 1,000 population greater than the national average. Clearly, different patient populations within the jurisdictions will impact these figures significantly. Factors affecting the patient load include the age distribution and the incidence of particular diseases. SA and Tasmania have older populations, however, their rates of use of IVIg are markedly different. We note that the smaller patient numbers mean that specific patient needs will strongly impact these figures. ACT may also be affected by providing services to New South Wales residents (cross border issues).

Figure 10 IVIg issued (grams per 1000 population) by jurisdiction by year



Source: IVIg Stars database maintained by the Blood Service.

Figure 11 2010/11 year costs of IVIg by jurisdiction



Source: IDMS database of purchases via Big Red

Table 9 Annual growth from previous year -Total issues of IVIg by jurisdiction between 2004/05 to 2010/11

	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT
2004/05	12.6%	-0.3%	-1.8%	18.4%	-10.2%	14.2%	3.0%	23.5%
2005/06	14.4%	21.7%	16.5%	7.8%	23.2%	3.0%	21.6%	2.5%
2006/07	12.8%	19.8%	17.7%	10.3%	-10.8%	29.9%	12.4%	-15.9%
2007/08	18.2%	7.8%	16.4%	6.3%	14.1%	4.6%	31.6%	1.4%
2008/09	15.2%	2.7%	14.4%	-0.5%	22.9%	14.3%	-16.3%	53.9%
2009/10	13.4%	11.0%	15.2%	-3.9%	11.8%	6.9%	20.9%	-18.0%
2010/11	11.2%	10.2%	15.6%	10.4%	-4.5%	7.9%	28.3%	6.6%

Source: IDMS database of issues via Big Red.

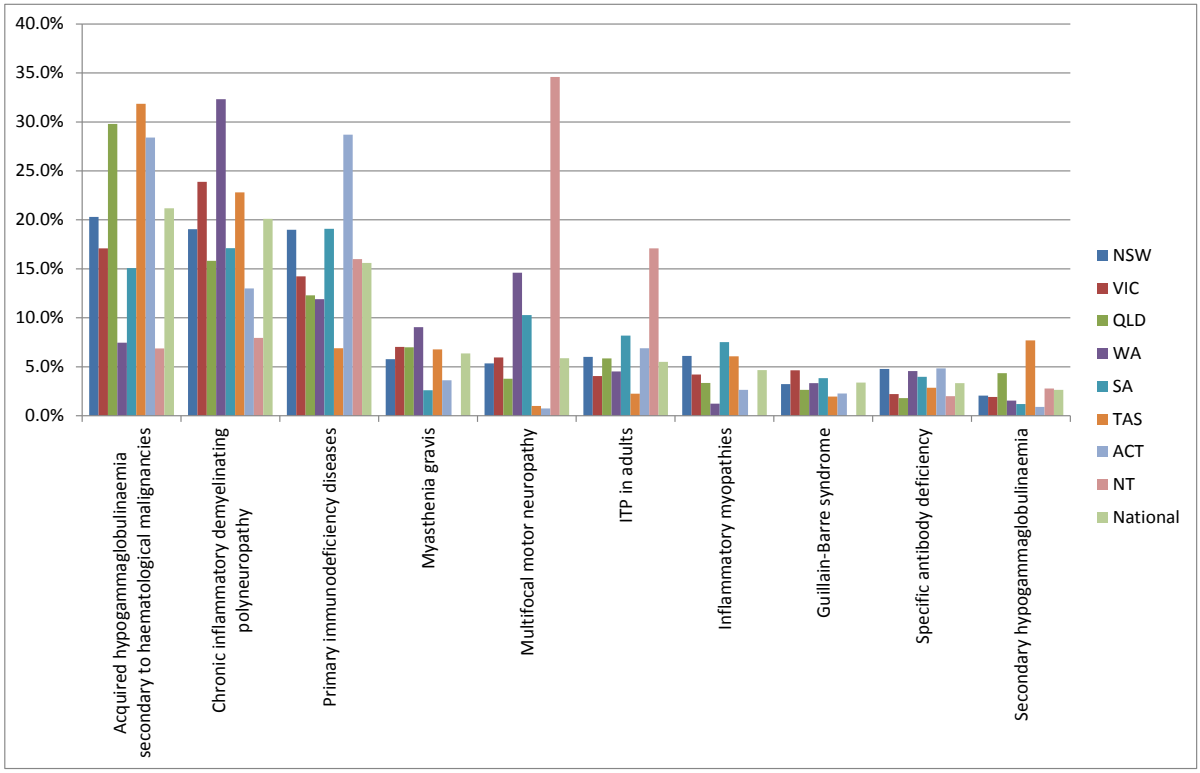
Despite the introduction and promulgation of *the Criteria* in 2008, setting uniform access criteria for IVIg, the growth in its use varies significantly across jurisdictions. This, together with the strong growth in total use of IVIg, has generated interest in a better understanding of the clinical demand, treatment, and management arrangements for IVIg in each jurisdiction.

In response to these issues, in March 2011, a joint meeting of the Clinical, Technical and Ethical Principal Committee (CTEPC) and the Jurisdictional Blood Committee (JBC) agreed to a review of the authorisation process and clinical governance framework for IVIg as a priority task. A tender to undertake a review into the administrative and clinical governance options for IVIg has been released.

7.3.IVIG ISSUED BY TOP 10 PRIMARY DIAGNOSIS BY STATE

The top 10 primary diagnoses nationally and by jurisdiction for the four quarters in 2010/11 are presented in Figure 12. Top 10 diagnoses differ between jurisdictions. As shown in Figure 8 nationally, acquired hypogammaglobulinaemia secondary to haematological malignancies (21.2%), CIDP (20.1%) and PID (15.6%) were the indications for which the greatest proportion of IVIg was issued in 2010/11.

Figure 12 Proportion of IVIg issued by top 10 diagnoses by jurisdiction for 2010/11



Source: IVIg Stars database maintained by the Blood Service.

7.4.IVIG ISSUED (GRAMS PER 1000 POPULATION) BY JURISDICTION

The grams issued per 1000 head of population for each indication varies between jurisdictions and complete data for each jurisdiction can be found at *Appendix A*
IVIg by grams per 1000 head of population - 2010/11 by jurisdiction and . Some of the more notable differences in average dose per patient by indication are shown in Table 10.

Table 10 IVIg issued (grams per 1000 head of population) by indication and by jurisdiction

Disease Group	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Australia
Chapter 5									
Acquired hypogamma-globulinaemia secondary to haematological malignancies	29.23	21.33	47.77	6.41	16.02	54.47	45.36	2.69	28.31
Chronic inflammatory demyelinating polyneuropathy	27.43	29.79	25.36	27.80	18.16	39.00	20.77	3.11	26.85
Primary immunodeficiency diseases	27.35	17.75	19.70	10.24	20.26	11.77	45.82	6.25	20.85
Myasthenia gravis	8.31	8.78	11.21	7.78	2.76	11.57	5.79	0.00	8.50
Multifocal motor neuropathy	7.69	7.42	6.07	12.56	10.92	1.70	1.18	13.52	7.85
ITP in adults	8.66	5.06	9.40	3.89	8.70	3.87	11.02	6.68	7.34
Inflammatory myopathies	8.79	5.27	5.36	1.07	7.98	10.37	4.24	0.00	6.24
Guillain-Barre syndrome	4.64	5.79	4.24	2.87	4.08	3.36	3.64	0.00	4.53
Chapter 5 Total	**123.87**	**102.76**	**132.43**	**72.91**	**89.84**	**137.70**	**138.42**	**33.17**	**112.26**
Chapter 6									
Specific antibody deficiency	6.87	2.76	2.90	3.92	4.22	4.90	7.73	0.78	4.45
Secondary hypogammaglobuli naemia	2.98	2.41	6.98	1.33	1.27	13.15	1.45	1.09	3.55
Kidney transplantation	1.34	7.70	1.31	1.08	0.56	3.10	1.23	0.00	2.84
HSCT (for prevention of GvHD in high risk Allogeneic HSCT)	0.17	2.00	6.26	0.02	3.14	0.00	0.00	0.00	2.06
Chapter 6 Total	**16.29**	**19.09**	**23.96**	**10.18**	**13.41**	**25.73**	**16.10**	**4.45**	**17.80**
Chapter 7 Total	3.84	2.48	3.88	2.71	2.92	7.56	5.12	1.48	3.41
Total	144.00	124.74	160.28	86.00	106.18	170.98	159.65	39.10	133.59

Source: IVIg Stars database maintained by the Blood Service.

Note: Caution should be used when interpreting these figures for the small jurisdictions.

Understanding the differences in the amount of IVIg issued per 1000 head of population between jurisdictions for the more common indications would be beneficial. For example, the amount of IVIg issued per 1000 head of population for CIDP varies from 39g to 3g, with the national average being 26.8g.

7.5. PATIENT COUNTS

Excluding IVIg issued under DOs, a total of 11,457 unique patients were issued IVIg nationally over 2010/11 and there were 93,887 patient episodes. Patient numbers by quarter are shown in Table 11. Note these are numbers of the unique patients for whom IVIg was issued in the quarter. A particular patient may appear in a number of quarters.

Table 11 Number of unique patients for whom IVIg was issued by jurisdiction by Quarter

Year	Quarter	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Australia
2008/09	Sep	2216	1296	1448	402	331	145	105	13	5956
	Dec	2255	1327	1466	399	364	151	105	19	6086
	Mar	2261	1313	1470	357	362	170	99	17	6049
	Jun	2383	1356	1544	373	395	177	98	31	6357
2009/10	Sep	2447	1377	1652	385	400	184	112	24	6581
	Dec	2499	1388	1670	357	440	177	109	20	6660
	Mar	2556	1394	1682	354	395	183	102	15	6681
	Jun	2607	1460	1755	373	413	189	121	22	6940
2010/11	Sep	2707	1506	1839	376	420	197	144	22	7211
	Dec	2784	1545	1887	395	394	205	132	21	7363
	Mar	2761	1544	1888	379	397	214	130	15	7328
	Jun	2800	1628	1947	385	419	200	142	23	7544

Source: IVIg Stars database maintained by the Blood Service.

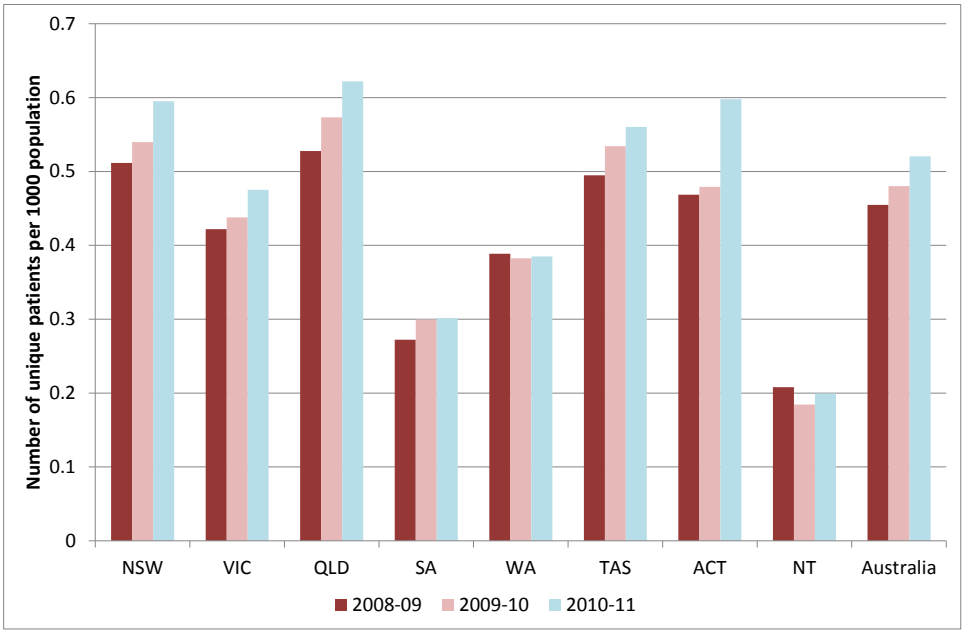
From Table 11, note that the growth between 2009/10 and 2010/11 of the average number of unique patients over the quarters for all Australia is 9.6%. This growth is, however, not the same in each state. The ACT with 23.4%, Queensland with 11.9%, Tasmania with 11.3% and Victoria with 10.7% have above average growth. New South Wales is just below the average with 9.3%. WA has less than half the growth at 4.5% and NT has no growth. SA has a decline in the average number of unique patients of 1.1%.

Figure 13 Jurisdiction share of unique patients receiving IVIg in June quarter 2011 compared with the jurisdiction share of population in Jun quarter 2011

Source: IVIg Stars database maintained by the Blood Service.

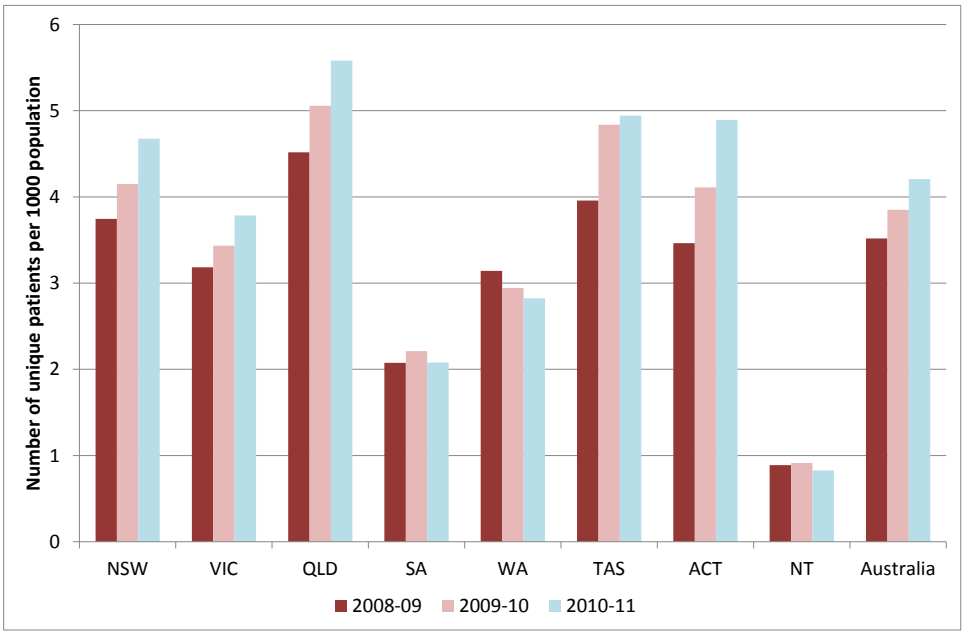
Figure 13 shows the jurisdictional share of patient numbers and compares them with the jurisdictions population share. New South Wales and Queensland number shares are significantly above their population.

Figure 14 Numbers of unique patients by state for 2008/09 to 2010/11



Source: IVIg Stars database maintained by the Blood Service and ABS population statistics.

Figure 15 Treatment episodes per 1000 population by state for 2008/09 to 2010/11



Source: IVIg Stars database maintained by the Blood Service and ABS population statistics.

Figure 14 shows the variability between the states in the numbers of unique patients and Figure 15 shows the number of treatment episodes. Moreover, the figures show that most states have strong growth in numbers and treatment episodes underpinning their growth in use of IVIg.

7.6. VARIABILITY BETWEEN JURISDICTIONS

Variability between jurisdictions in the way IVIg is used may by measured in a number of ways. Table 12 shows the average grams issued to patients with selected conditions. Appendix A shows the grams IVIg per 1000 population the grams issued per episode for the different indications is shown at Appendix B. Clearly, any of these measures for the jurisdictions with smaller populations should be viewed with caution.

Table 12 presents the differences for twenty disease groups using the largest amounts of IVIg. In general, such variance in average grams per patient from national average and between jurisdictions warrants further consideration. In particular, it would be informative to understand the reasons for the variation in the doses issued for some of the more common indications such as CIDP, multifocal motor neuropathy with persistent conduction block, polymyositis, and severe combined immunodeficiency. For example, in severe combined immunodeficiency, there is more than a two-fold variation in dose issued per patient between even the large patient population jurisdictions.

Table 12 Average grams IVIg issued per unique patient by disease group and by jurisdiction 2010/11

Disease group	Chapter	NSW	Vic.	Qld.	WA	SA	Tas.	NT	ACT	Australia
Acquired hypogammaglobulinaemia secondary to haematological malignancies	5	186.13	197.40	229.15	174.99	174.95	221.64	237.62	124.20	203.05
Chronic inflammatory demyelinating polyneuropathy	5	366.54	484.64	370.78	708.08	427.96	601.21	528.43	358.50	428.29
Primary immunodeficiency diseases	5	303.01	312.80	296.55	300.82	276.21	299.40	302.24	180.38	300.81
Myasthenia gravis	5	334.47	396.92	360.13	445.74	189.92	392.40	412.80		360.10
Multifocal motor neuropathy	5	390.04	560.52	364.11	822.64	782.78	288.00	420.00	780.00	490.69
ITP in adults	5	174.28	122.52	158.23	120.55	143.44	140.57	196.25	128.50	152.19
Inflammatory myopathies	5	307.18	409.06	394.65	245.60	424.68	586.11	377.25		354.18
Guillain-Barre syndrome	5	176.97	174.52	163.80	146.01	181.74	213.56	117.82		170.92
Specific antibody deficiency	6	276.42	287.15	210.29	209.19	248.57	356.14	275.40	90.00	257.99
Secondary hypogammaglobulinaemia	6	140.09	156.08	205.55	112.81	189.82	371.50	258.00	126.00	174.73
Kidney transplantation	6	122.19	248.27	175.59	164.43	115.38	315.00	219.00		202.17
HSCT (prevention of GvHD in high risk Allogeneic HSCT)	6	51.23	289.76	257.38	28.50	370.50				243.67
Stiff person syndrome	5	400.00	496.20	1127.14		504.00	608.00		210.00	603.32
Foeto-maternal /neonatal alloimmune thrombocytopenia	6	154.80	199.37	690.43	683.40	615.00		6.00	6.00	368.24
Pemphigoid	6	668.00	518.00	1133.25		255.00		981.00		732.50
Autoimmune haemolytic anaemia	6	119.46	100.02	161.72	88.33	152.50	83.00	96.00		123.68
Pemphigus	6	695.00	354.00	583.20	345.00	1647.00				599.19
Kawasaki disease	5	42.22	40.87	39.13	36.25	43.35	49.50	109.50		41.63
Ig para-proteinaemic neuropathy	6	296.73	238.50	204.60	754.00	180.00				282.12
Toxic shock syndrome	6	149.35	119.92	101.46	118.75	69.00	30.00	119.00	150.00	121.73

Source: IVIg Stars database maintained by the Blood Service.

7.7.ISSUED AND REPORTED AS 'CRITERIA NOT MET'

The Blood Service was asked to indicate circumstances where IVIg was issued to patients who did not meet *the Criteria* in Chapters 5, 6 or 7. IVIg is sometimes issued in emergency life threatening situations prior to diagnosis or in situations where the Clarification Process has not published a 'resolution' and the Jurisdictional Blood Committee (JBC) has decided to allow continued access to IVIg until such time as a resolution is published.

Table 13 lists the requests that did not meet *the Criteria* but for which product was issued by the Blood Service. A total of 69,120g were issued to 880 unique patients, representing 2,307 treatment episodes.

Table 13 Issues of IVIg under the National Blood Arrangements which did not meet the Criteria

	2008/09			2009/10			2010/11		
	Patients	Episodes	Issued (grams)	Patients	Episodes	Issued (grams)	Patients	Episodes	Issued (grams)
Criteria Not Met	852	2325	69,093	60	139	4,569	37	43	1,644
Indefinite	1	2	48						
DO Advised				13	0	0	20	0	0
DO Issued	2	1	140	7	9	377	5	6	215
Pending	28	94	2,603	9	17	474	39	85	2,996
Single	1	1	27	1	13	507	1	1	30
Not approved	39	0	0	61	0	0	65	0	0
Grand Total	923	2423	71,911	151	178	5,927	167	135	4,885

Source: IVIg Stars database maintained by the Blood Service.

The application of *the Criteria* means that the number of patients receiving IVIg who do not meet *the Criteria* has fallen from 852 on 2008/09 to 37 patients in 2010/11.

7.8. RECONCILIATION

A reconciliation of STARS quarterly data with the Blood Service clinical issue reports that the NBA receives on a monthly basis indicates small variances (Table 14). Nationally reconciliation indicated that, the Blood Service issues were within half a per cent of the data recorded in STARS. In the Northern Territory, approximately 14% more IVIg was issued than is recorded in STARS, whilst in South Australia and the ACT there were more issues recorded in STARS than actual issues during that time period (approximately 5% and 4% respectively). In some cases these differences can be explained by product being ordered and recorded in STARS the month prior to product actually being issued.

Table 14 Reconciliation of STARS (STARS minus NBA issues, in grams) quarterly data with the Blood Service monthly clinical issue reports by jurisdiction and nationally

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
NSW	3.6%	-0.1%	-0.5%	0.0%	-1.0%	-1.3%	-1.5%
Vic.	-6.1%	-4.3%	-2.9%	0.4%	2.2%	1.7%	-2.7%
Qld.	11.7%	6.7%	-4.3%	-3.8%	-1.2%	-0.6%	1.1%
SA	0.6%	-5.4%	4.6%	3.3%	5.1%	-1.0%	0.3%
WA	-4.4%	-2.3%	-1.2%	-0.1%	-0.6%	0.0%	-5.2%
Tas.	-1.8%	1.3%	-11.7%	-2.2%	2.6%	0.6%	-2.3%
NT	-6.4%	-4.0%	-7.9%	-5.5%	-13.7%	-5.2%	0.3%
ACT	-3.7%	-17.0%	-1.1%	-9.2%	4.5%	3.0%	1.7%
Total	1.5%	-0.6%	-2.1%	-0.8%	0.3%	-0.2%	-1.2%

Source: NBA IDMS issues data and IVIg Stars database maintained by the Blood Service.

Note: The proportion the STARS data is in excess of the NBA issues data for the same period.

8. DEMOGRAPHICS OF IVIG PATIENTS

This section provides demographic information on patients to whom IVIg was issued based on the entries in the STARS database between the September quarter 2008 and June quarter 2011. It is assumed that the Patient IDs are unique and sequential or increasing over time. Table 15 shows the basic count information.

Table 15 Basic numbers

	Number
Total unique patient Ids	20,091
Total unique patient Ids with some weight data	14,795
Total unique patient Ids with an age recorded	15,938
Total unique patient Ids with a weight change	2,522
Total unique patient Ids with more than one jurisdiction	382
Total unique patient Ids with two jurisdictions	352
Total unique patient Ids with three jurisdictions	25
Total unique patient Ids with more than one diagnosis	1,547
Total unique patient Ids with two diagnoses	1403
Total unique patient Ids with three diagnoses	135
Total unique patient Ids with four diagnoses	8
Total unique patient Ids born 1920 or earlier	147

Source: IVIg Stars database maintained by the Blood Service.

Table 16 Additions to the database - number of Patient IDs added in quarter

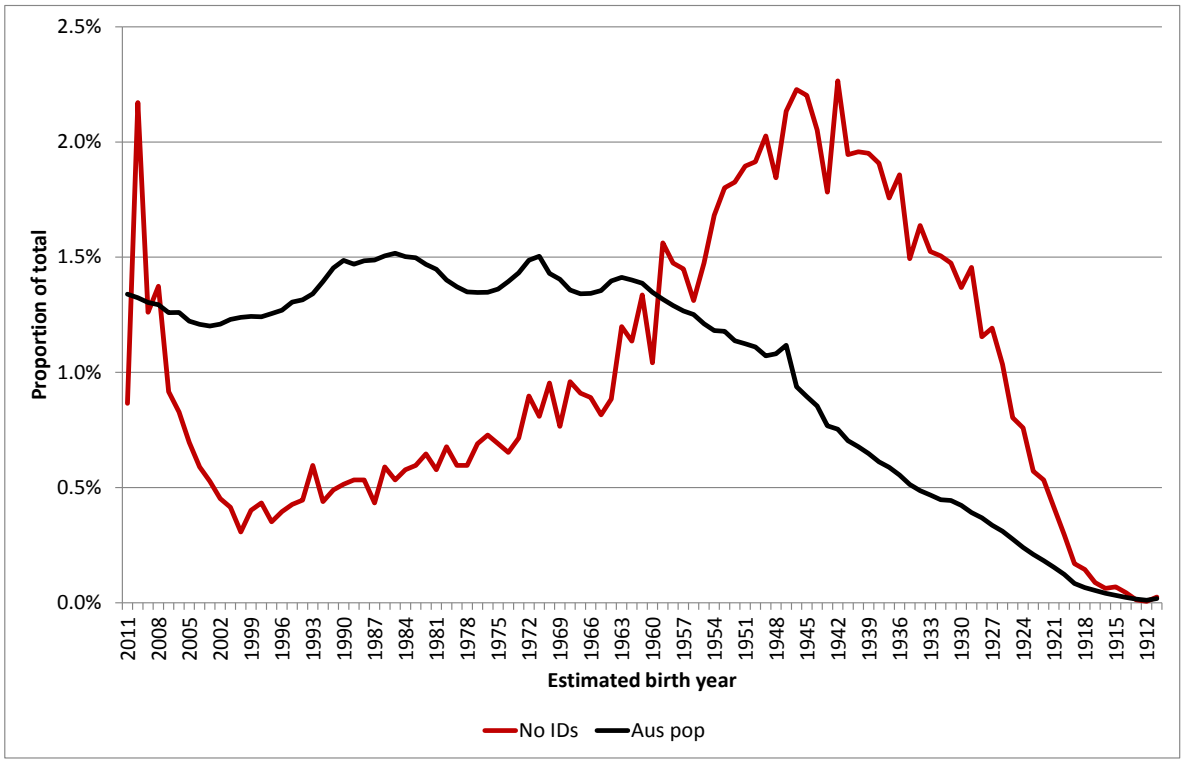
Sep Q08	Dec Q08	Mar Q09	Jun Q09	Sep Q09	Dec Q09	Mar Q10	Jun Q10	Sep Q10	Dec Q10	Mar Q11	Jun Q11
7306	1110	1046	1096	1390	1277	986	929	1423	1131	1256	1141

Source: IVIg Stars database maintained by the Blood Service.

Table 16 shows that the average number of new patients each quarter is approximately 1,000. The September quarter 2008 has a larger number of patients because of the existing patients (approximately 6,000), who were issued their first IVIg prior to 2008/09 and received some IVIg in that quarter. Under the assumption that Patient IDs are almost sequential, new patients in a quarter will have a Patient ID greater than any patients in the previous quarter and less than any new patients in the next quarter.

The STARS data has age and weight data recorded at treatment dates. These data will change over time. The year of birth is calculated from age data and applied that to all of the patient's treatments. The distribution of estimated birth years is shown in Figure 16 where it is compared with the age distribution of the Australian Population from the Australian Bureau of Statistics (ABS).

Figure 16 Proportion of IVIg Patient IDs by estimated birth year

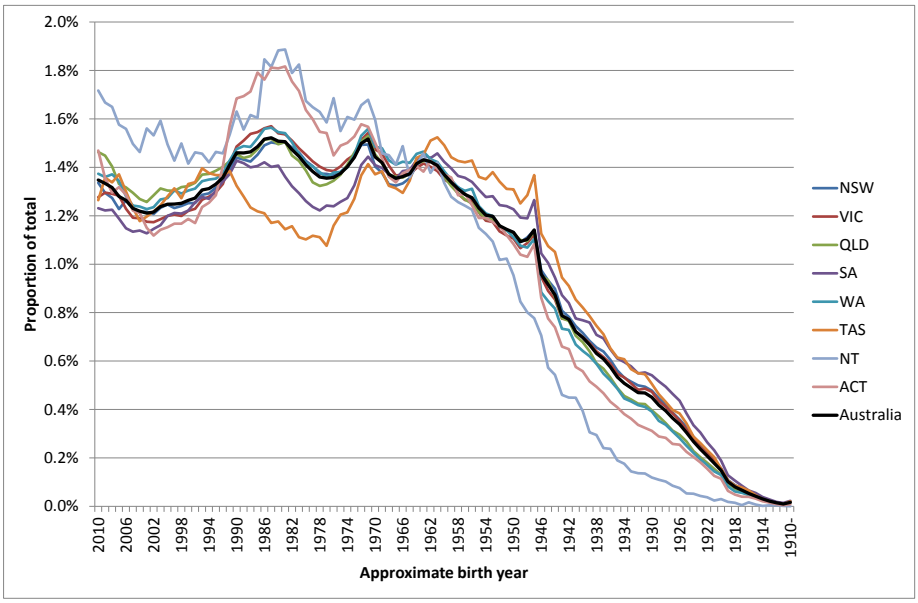


Source: IVIg Stars database maintained by the Blood Service.
ABS 3201.0 Population by Age and Sex, Australian States and Territories

Figure 16 shows that there is a spike of IVIg issued for the very young and those over 70 years. The median birth year of patients for whom IVIg is issued is 1952, compared to the median birth year for the Australian population which is 1973 (i.e. age 37), indicating that half the IVIg issued is for patients over 60.

The age profiles (from ABS data) of the different jurisdictions are shown in Figure 17 and Table 17. It can be seen that the Northern Territory has a very young profile with a higher population in the early working age period. The ACT also has a higher population in the working years. South Australia and Tasmania have older populations and lower than average proportion in working ages.

Figure 17 Proportion of population 2010 by approximate birth year



Source: ABS 3201.0 Population by Age and Sex, Australian States and Territories

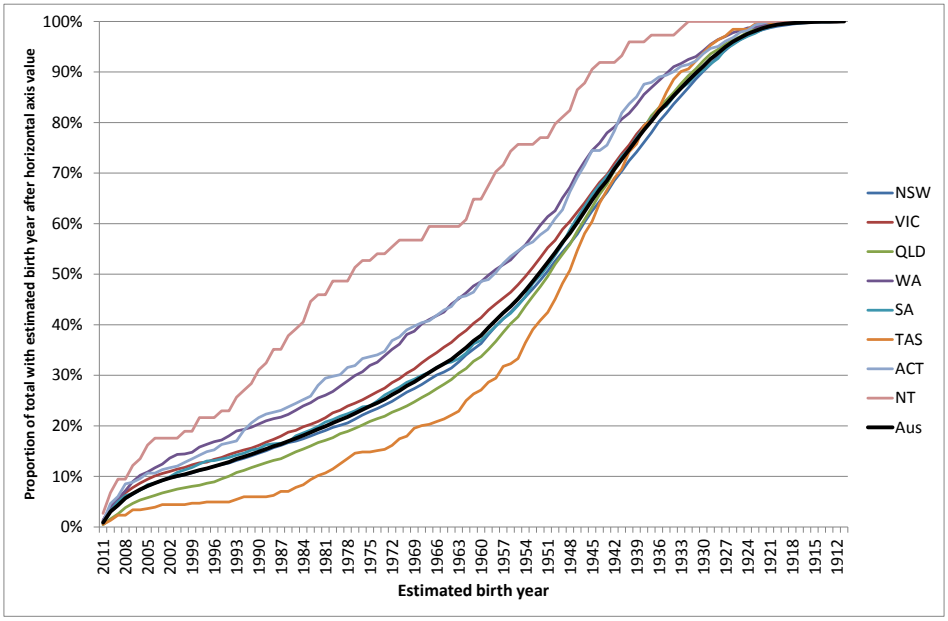
Table 17 Median estimated year of birth for IVIg patients

NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Australia
1951	1953	1950	1958	1951	1948	1958	1977	1952

Source: IVIg Stars database maintained by the Blood Service.

Figure 18 shows the cumulative distribution of estimated birth years. Jurisdictions with lines to the left have generally younger age profiles than jurisdictions with lines to the right.

Figure 18 Cumulative distribution of estimated birth year of IVIg patients by jurisdiction



Source: IVIg Stars database maintained by the Blood Service.

Table 18 Median estimated year of birth for IVIg patients for the top 40 primary diagnoses by grams used

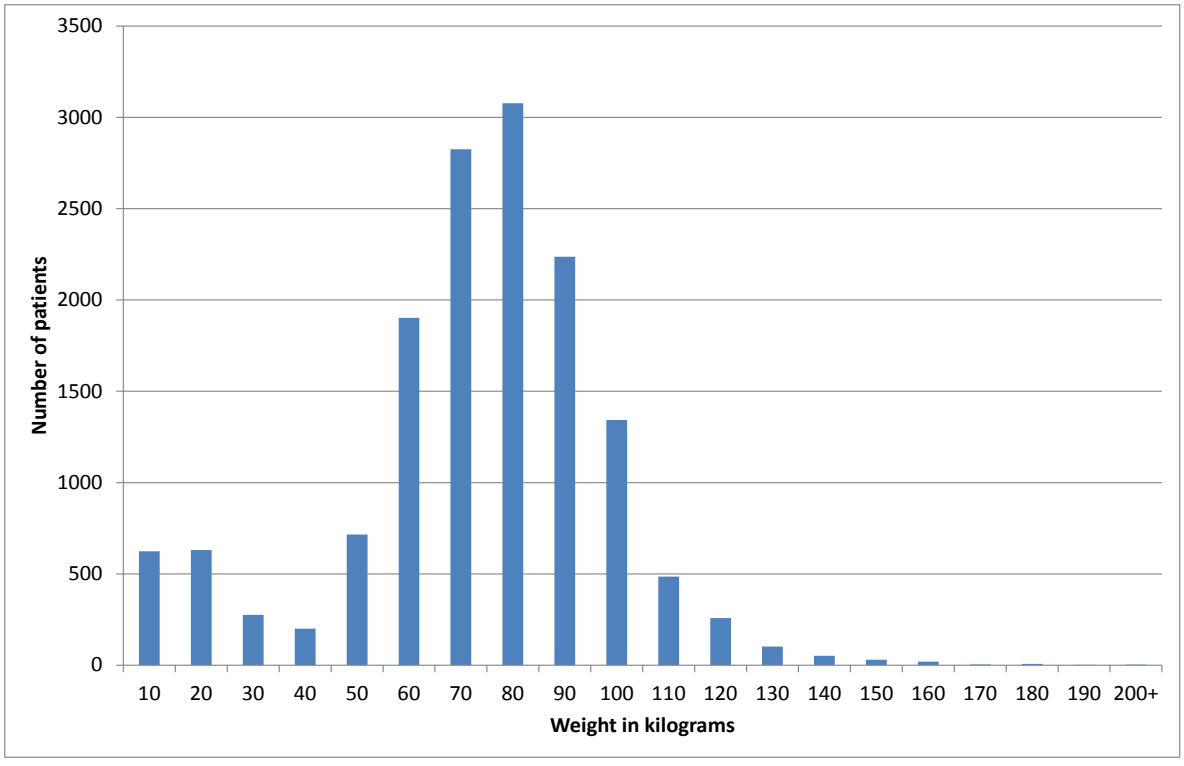
Primary Diagnosis	Patients	Patients with known age	Patients with known age (%)	Median estimated birth year	Total (grams) 2008/09 – 2010/11
Chronic inflammatory demyelinating polyneuropathy	2004	1723	86%	1946.0	1,620,355
Common variable immunodeficiency disease	1487	1364	92%	1957.0	1,060,980
Chronic lymphocytic leukaemia	1547	1305	84%	1938.0	634,366
Myasthenia gravis	799	675	84%	1947.0	486,371
Multifocal motor neuropathy with persistent conduction block	478	421	88%	1952.0	465,093
Multiple myeloma	1365	1121	82%	1941.0	457,263
Non-Hodgkins lymphoma	997	863	87%	1944.0	376,528
Guillain-Barré syndrome	1592	1085	68%	1958.0	272,362
ITP refractory	1310	893	68%	1949.0	217,625
Secondary hypogammaglobulinaemia (excludes haematological malignancies)	787	618	79%	1958.0	203,871
Polymyositis	325	275	85%	1949.0	199,036
IgG subclass deficiency EXISTING patients only	334	252	75%	1949.0	192,768
Other relevant haematological malignancies	882	666	76%	1957.0	190,127
ITP in specific circumstances (surgery, corticosteroids contraindicated, chronic ITP)	1036	745	72%	1949.0	162,801
Kidney transplantation post-transplant	540	407	75%	1962.0	145,079
Specific antibody deficiency	635	219	34%	1956.0	128,140
HSCT (for prevention of GvHD in high risk Allogeneic HSCT).	444	334	75%	1962.0	121,984
Other primary immunodeficiency	283	175	62%	1959.0	119,008
X linked agammaglobulinaemia	133	107	80%	1989.0	89,222
Inclusion body myositis	123	98	80%	1938.0	73,420
Dermatomyositis	125	102	82%	1961.0	68,022
ITP with life-threatening haemorrhage	319	232	73%	1950.0	48,444
Stiff person syndrome	40	35	88%	1958.0	47,966
Foeto-maternal /neonatal alloimmune thrombocytopenia (Antenatal)	46	34	74%	1978.0	44,624
Autoimmune haemolytic anaemia	274	194	71%	1946.0	39,926
Kawasaki disease	825	547	66%	2007.0	33,034
ITP in pregnancy	186	138	74%	1980.0	32,050
Ig para-proteinaemic neuropathy	64	50	78%	1937.5	29,440
TSS - streptococcal	180	122	68%	1965.5	23,289
Solid organ - lung	143	118	83%	1959.0	22,216
Epilepsy (rare childhood cases)	43	37	86%	2002.0	21,240
Kidney transplantation pre-transplant	210	147	70%	1962.0	20,954
Pemphigus vulgaris	25	24	96%	1958.0	20,721
Toxic epidermal necrolysis/Steven Johnson syndrome	146	104	71%	1970.0	19,779
Severe combined Immunodeficiency	41	39	95%	1963.0	18,957

Primary Diagnosis	Patients	Patients with known age	Patients with known age (%)	Median estimated birth year	Total (grams) 2008/09 – 2010/11
ITP in children	375	256	68%	2006.0	18,886
Paraneoplastic syndromes	78	60	77%	1953.0	16,838
Potassium channel antibody-associated encephalopathy	57	49	86%	1965.0	16,776
Acute disseminated encephalomyelitis	91	68	75%	1990.0	16,385
Neonatal haemochromatosis	15	11	73%	1984.0	16,248

Source: IVIg Stars database maintained by the Blood Service.

Table 18 shows the median estimated year of birth for patients with the top 40 diagnoses who were issued IVIg. For a number of indications the proportion of patients with some age data recorded is lower than for other indications.

Figure 19 Distribution of reported weight of IVIg patients

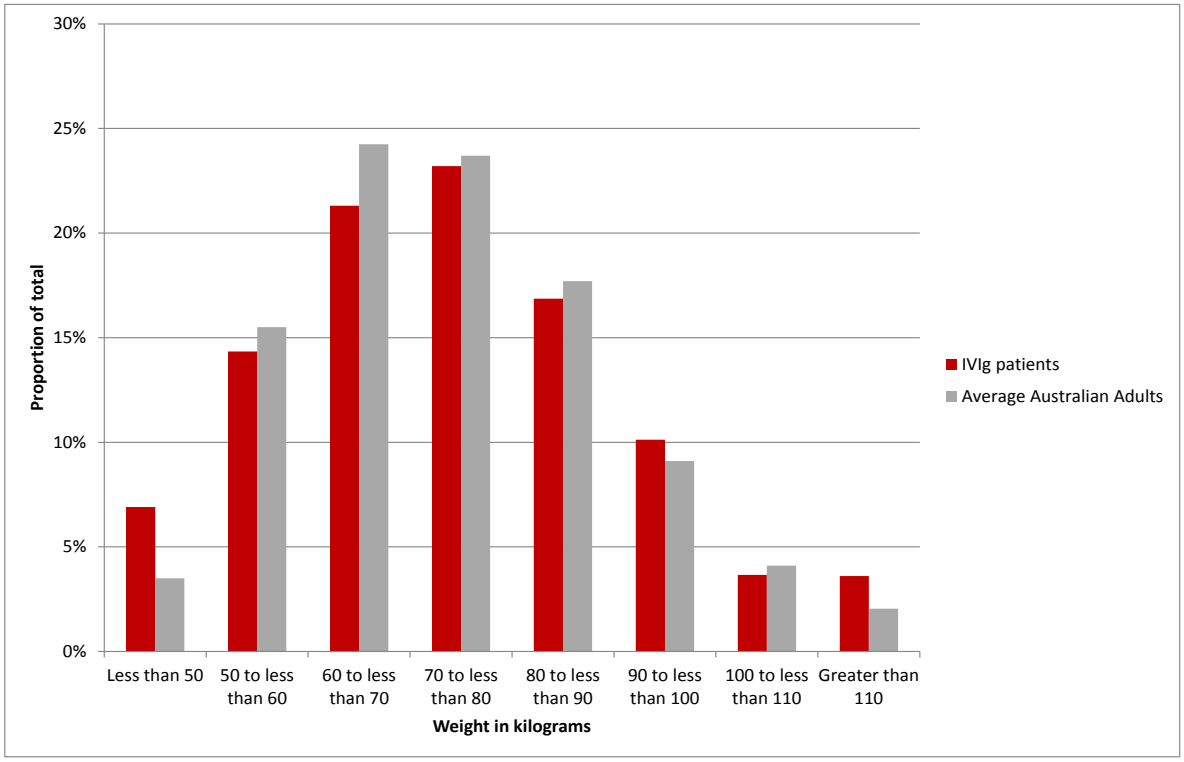


Source: IVIg Stars database maintained by the Blood Service.

Although weight data is not recorded for all IVIg patients, Figure 19 shows the weight distribution of patients receiving IVIg. In Figure 20 we make a comparison with ABS survey data from 1995. As the ABS data is for adults only we did not include IVIg patients with weight 20kg or less in the distribution. More current data only reports on body mass index which is calculated from body weight and height.

The data downloads did not include height data so we have made comparison with the older 1995 data. The STARS data does not have gender so the comparison is crude. It appears that IVIg have slightly more obese people proportionally than the Australia population, although average weights would appear to be slightly lower than the general Australian population.

Figure 20 The weight distribution of IVIg patients compared with adult Australia population



Source: IVIg Stars database maintained by the Blood Service.
ABS 4359.0 - How Australians Measure Up, 1995: Average of male and female as no total average published.

8.1. DOSING - NEW PATIENTS COMPARED WITH EXISTING PATIENTS FOR SELECTED DIAGNOSES

For all indications, understanding dosing, both initial and maintenance, assists with understanding clinical demand and informed decision making. Data recorded in both STARS and the NBA data systems allows us to investigate dosing practices and the NBA chose to analyse a random selection of patients within the top 5 indications to identify if:

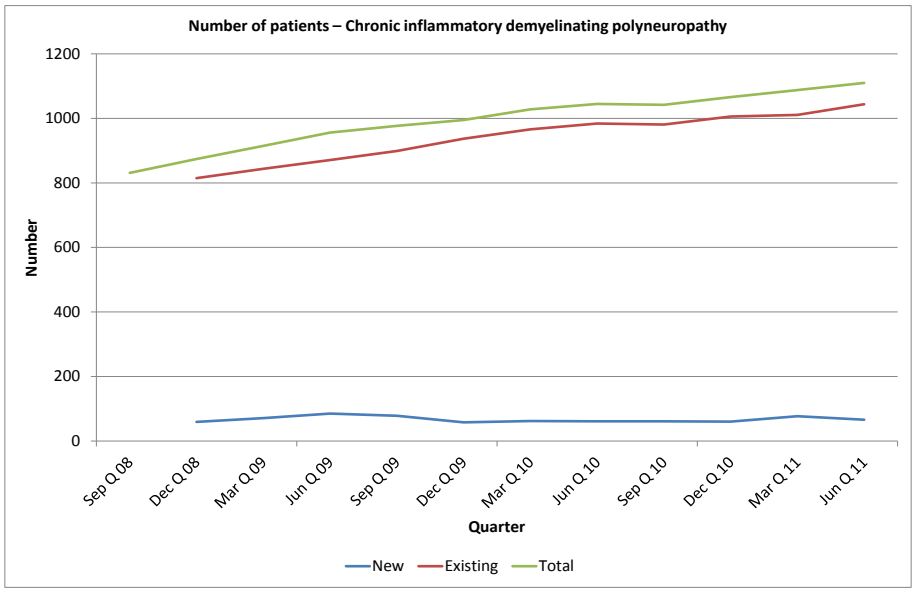
- there any clear differences in how new patients are dosed in relation to existing patients
- patient doses increase or decrease after initial doses
- the pattern of dosing over time for patients with chronic conditions.

We have classified patients as new in a quarter if they appear for the first time in that quarter for a diagnosis. The following analysis is for the five primary diagnoses that have the highest use of IVIg.

8.1.1. CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY (CIDP)

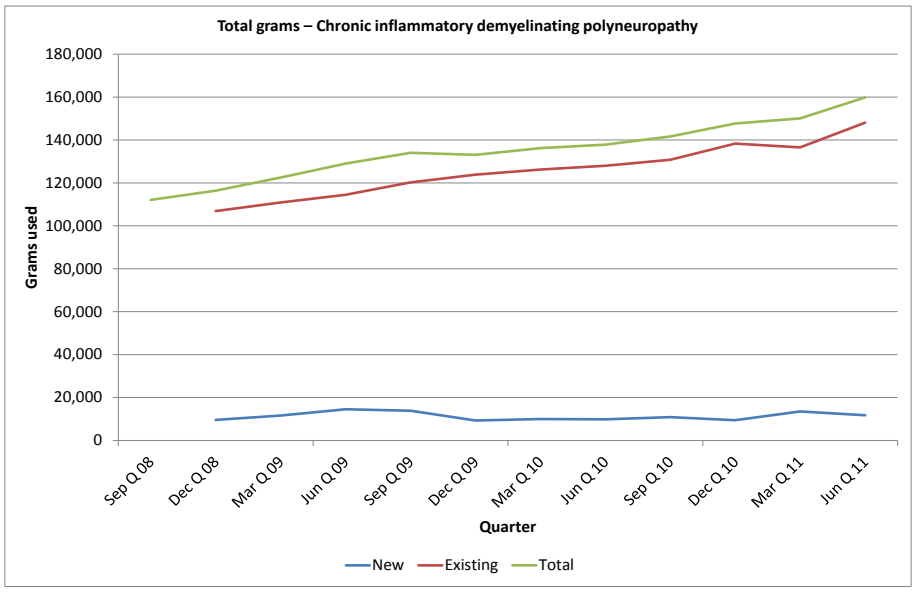
The following series of charts (Figure 21, Figure 22, Figure 23 and Figure 24) show numbers and amounts of IVIg for patients with CIDP. Figure 21 and Figure 22 show that the numbers of patients and total grams are increasing at a reasonably steady rate. The increase over the twelve quarters is 34% for numbers of patients and 43% for total grams. In Figure 23 the reasonably stable grams per patient shows that the growth in total grams is driven mainly by the increase in numbers of patients. On a per patient basis new patients are receiving between 20-30% more than existing patients. When the data are considered in terms of the amount per episode in Figure 24, the trend appears to be reasonably stable and new patient episodes doses are 10 to 15% lower than those of existing patients. This would indicate that the loading doses are given by increased frequency of dosing rather larger individual doses.

Figure 21 CIDP - new and existing - number of patients



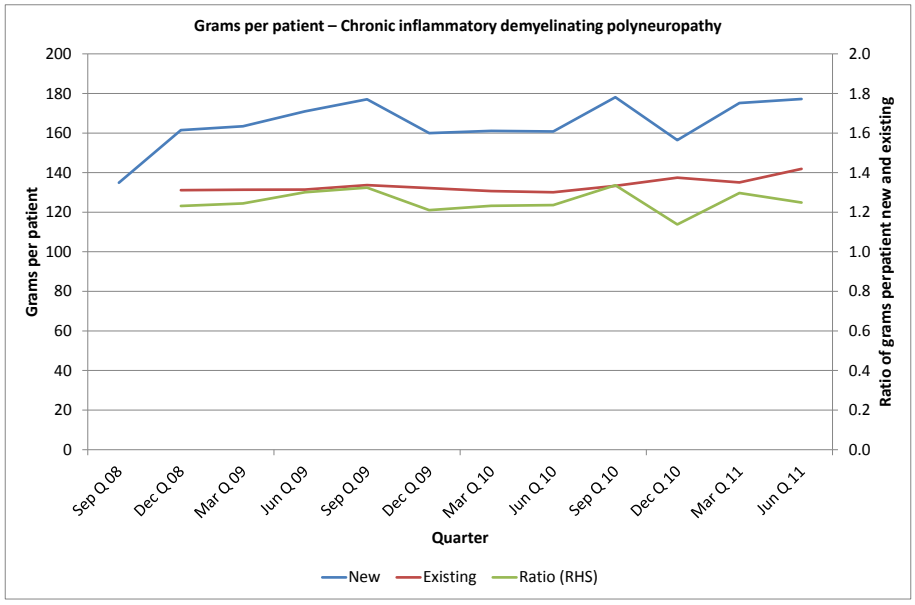
Source: IVIg Stars database maintained by the Blood Service.

Figure 22 CIDP - new and existing - total grams



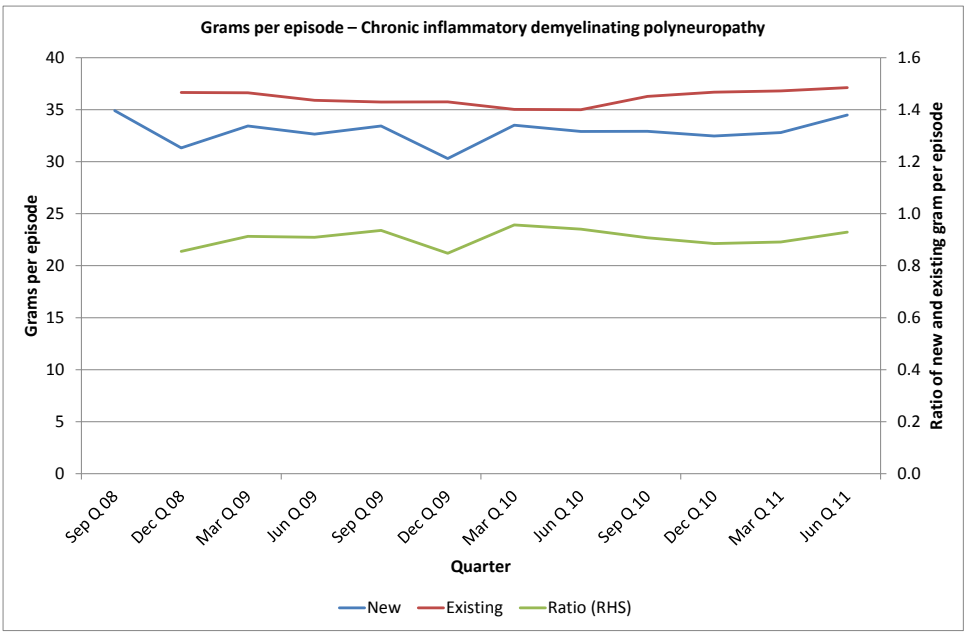
Source: IVIg Stars database maintained by the Blood Service.

Figure 23 CIDP - new and existing - grams per patient



Source: IVIg Stars database maintained by the Blood Service.

Figure 24 CIDP - new and existing - grams per episode

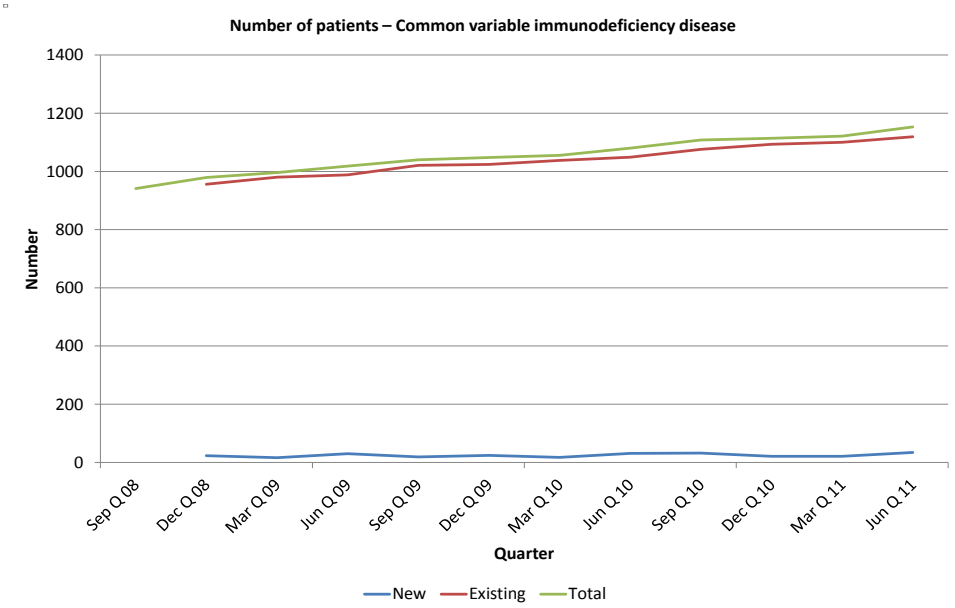


Source: IVIg Stars database maintained by the Blood Service.

8.1.2. COMMON VARIABLE IMMUNODEFICIENCY DISEASE (CVID)

The following charts (Figure 25 and Figure 26) show the numbers and grams per episode for CVID.

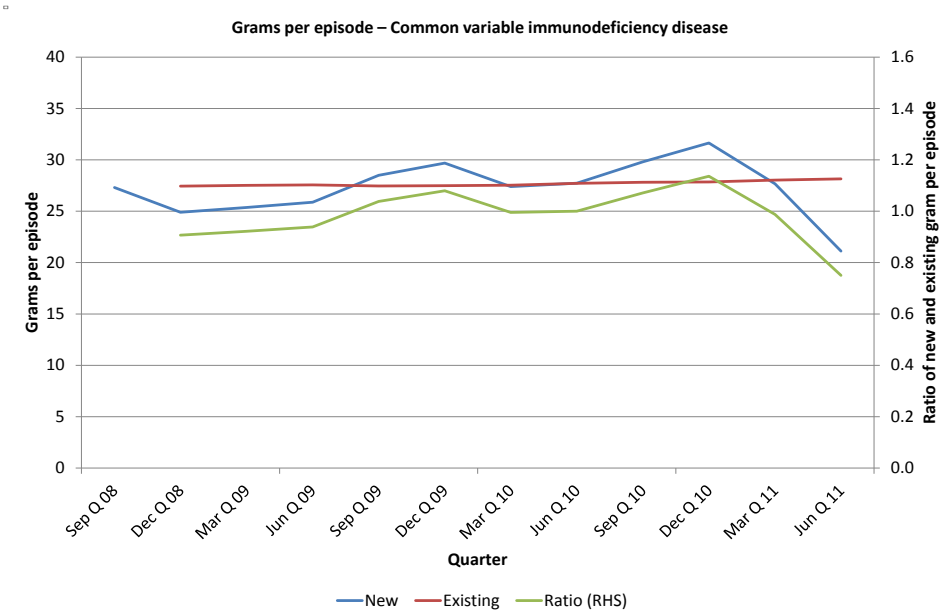
Figure 25 CVID - new and existing - number of patients



Source: IVIg Stars database maintained by the Blood Service.

Growth in the number of patients is proportionally smaller than with CIDP. The largest numbers of new patients appear in the June quarter in both years. The increase over the twelve quarters for CVID is 23% for numbers and 35% for total grams. The grams per episode are generally stable for existing patients. The grams per episode for new patients are more varied reflecting their low absolute numbers.

Figure 26CVID - new and existing - grams per episode

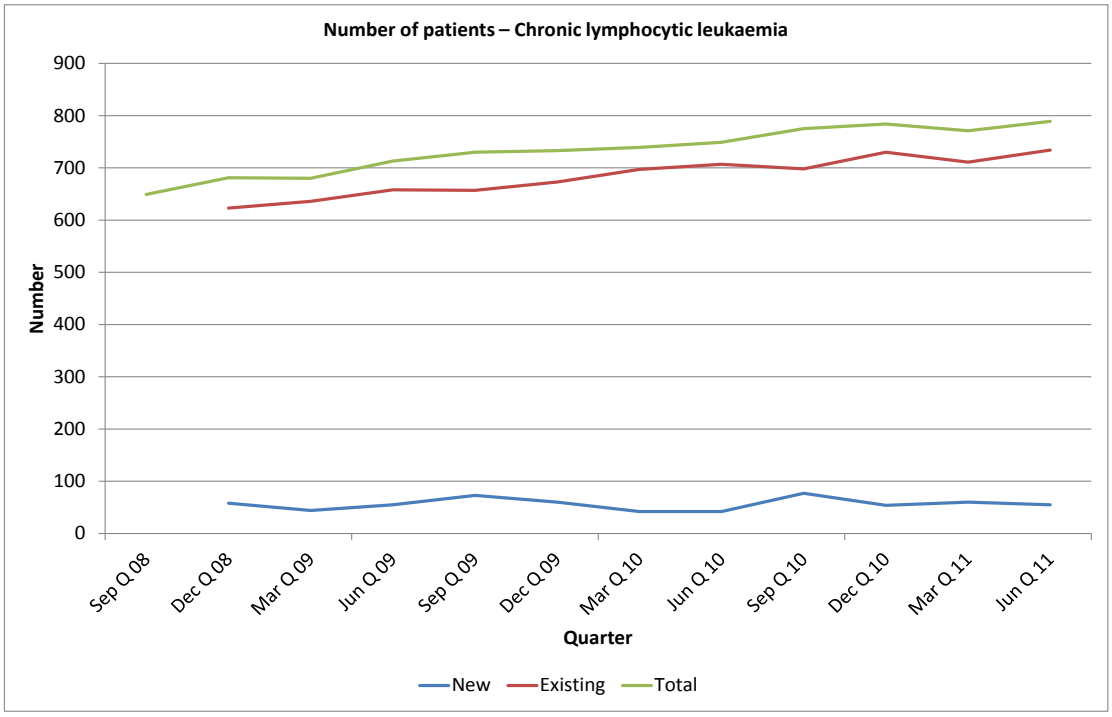


Source: IVIg Stars database maintained by the Blood Service.

8.1.3. CHRONIC LYMPHOCYTIC LEUKAEMIA (CLL)

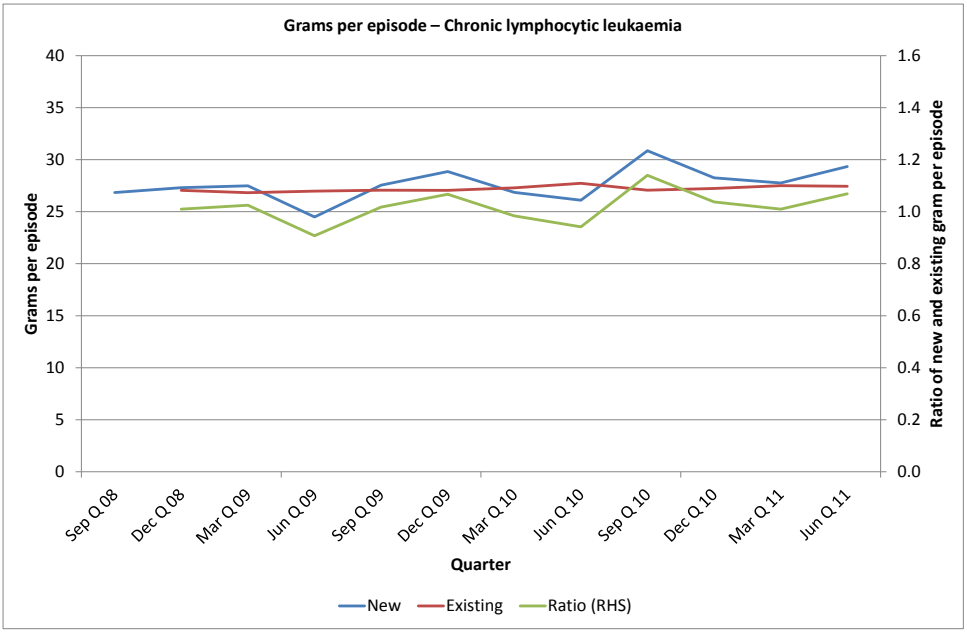
The increase over the twelve quarters is 22% for numbers of patients and 26% for total grams. There is a very slight increase in the dosage per episode for chronic lymphocytic leukaemia.

Figure 27 Chronic lymphocytic leukaemia - new and existing - number of patients



Source: IVIg Stars database maintained by the Blood Service.

Figure 28 Chronic lymphocytic leukaemia - new and existing - grams per episode

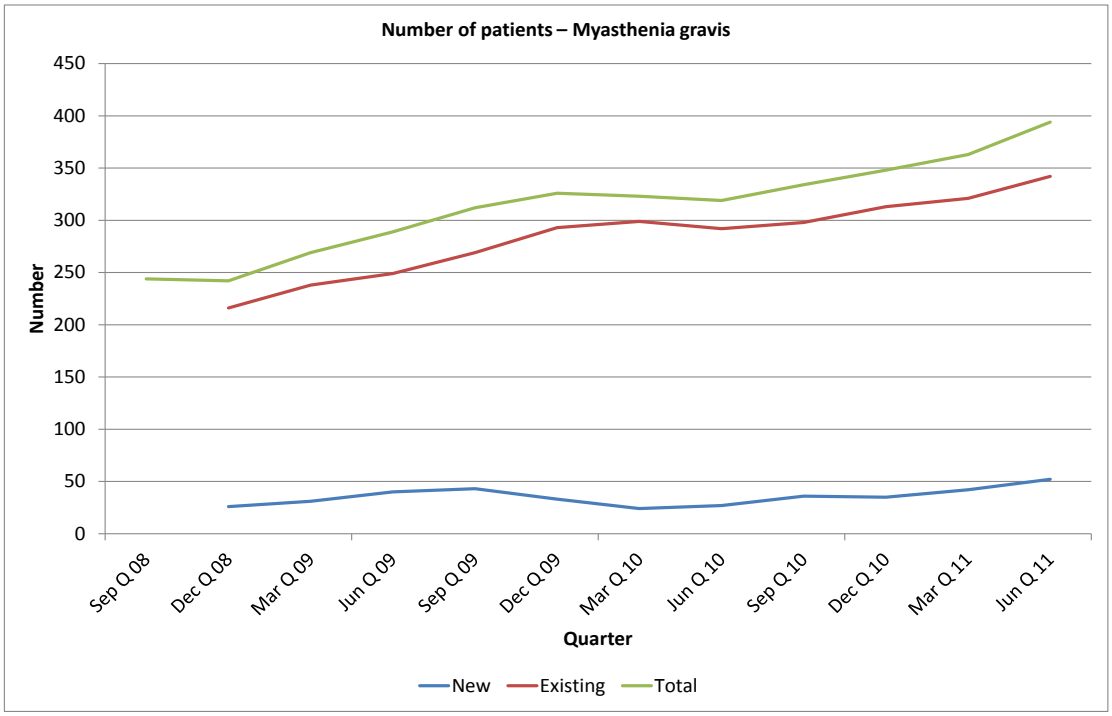


Source: IVIg Stars database maintained by the Blood Service.

8.1.4. MYASTHENIA GRAVIS

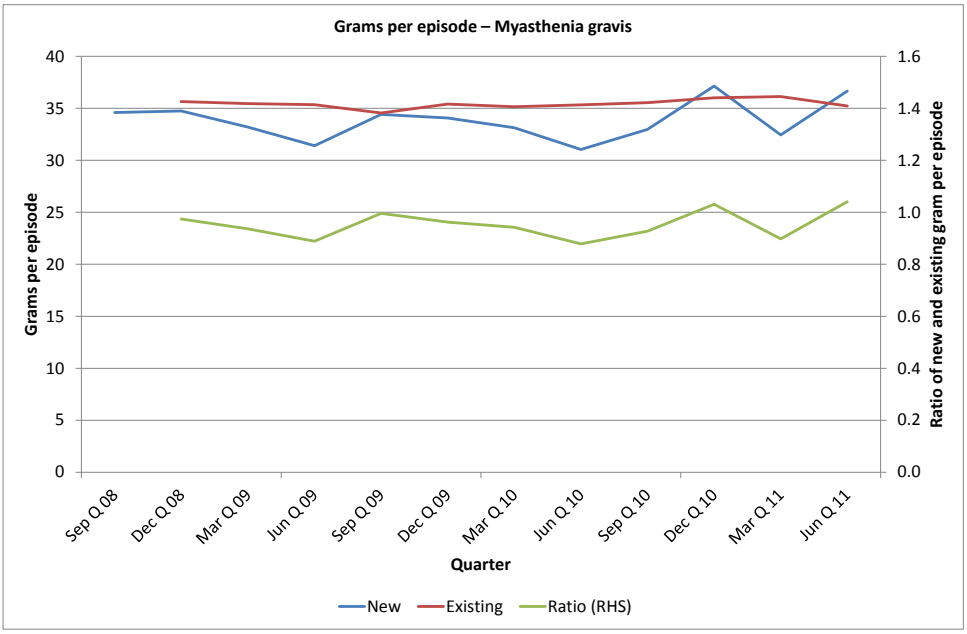
The increase over the twelve quarters is 61% for numbers of patients and 78% for total grams for this condition. The latter reflects a slight increase in the dose per episode interacting with the strong growth in numbers.

Figure 29 Myasthenia gravis - new and existing - number of patients



Source: IVIg Stars database maintained by the Blood Service.

Figure 30 Myasthenia gravis - new and existing - grams per episode

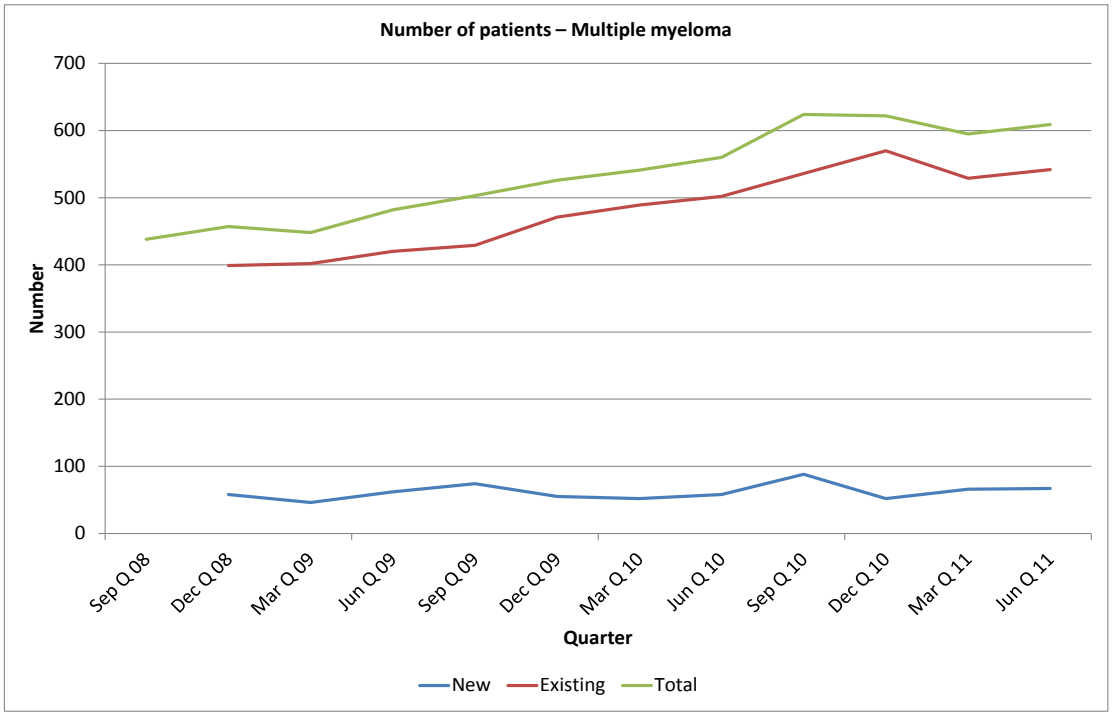


Source: IVIg Stars database maintained by the Blood Service.

8.1.5. MULTIPLE MYELOMA

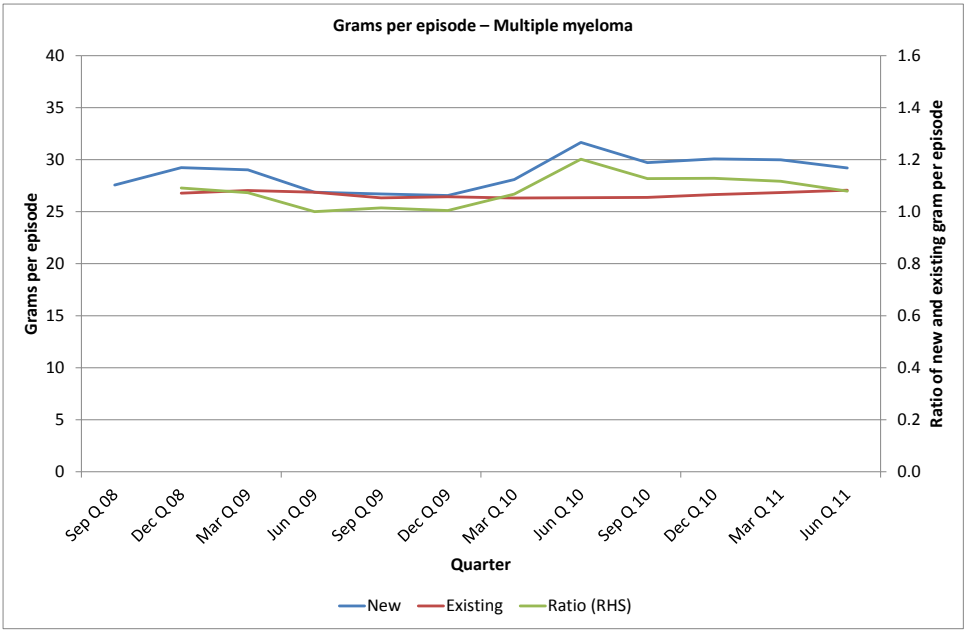
The increase over the twelve quarters is 39% for numbers of patients and 43% for total grams for this condition. The latter reflects a slight increase in the dose per episode.

Figure 31 Multiple myeloma - new and existing - number of patients



Source: IVIg Stars database maintained by the Blood Service.

Figure 32 Multiple myeloma - new and existing - grams per episode



Source: IVIg Stars database maintained by the Blood Service.

8.2. DIFFERENCE IN USE BETWEEN JURISDICTIONS - SELECTED INDICATIONS

In this section we compare the grams issued per treatment episode for some selected indications between jurisdictions. The five indications for which the greatest amount of IVIg was issued over the last two financial years are presented.

8.2.1. CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY (CIDP)

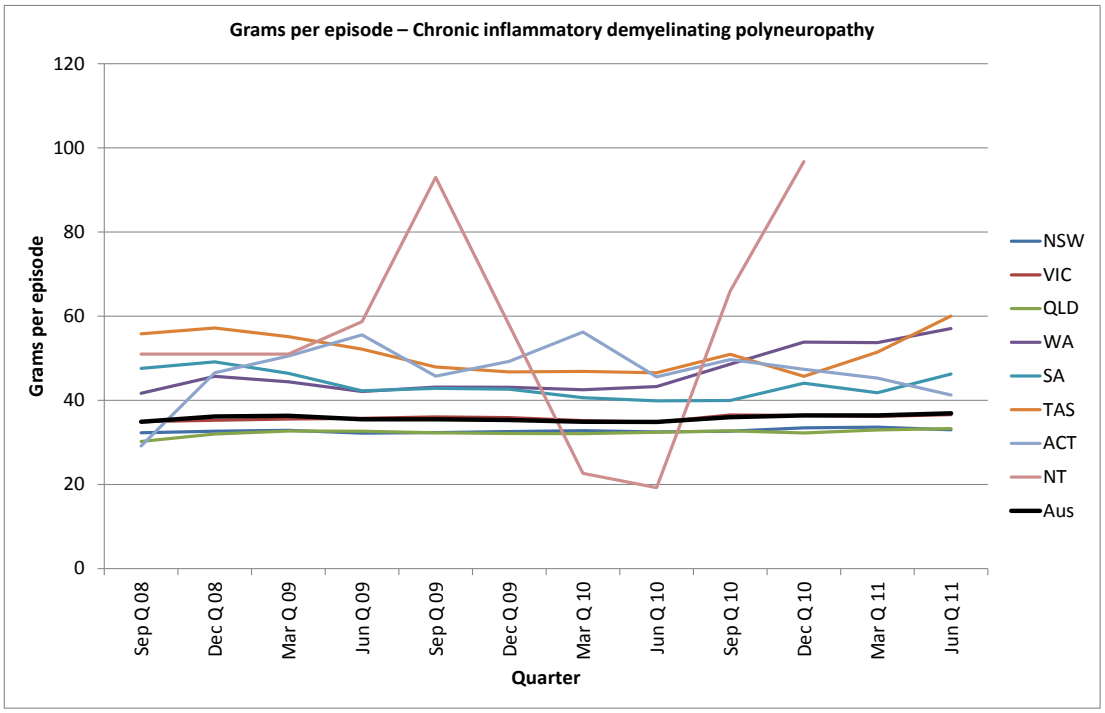
Figure 33 shows the grams issued per treatment episode for the different jurisdictions for chronic inflammatory demyelinating polyneuropathy. The small jurisdictions have very small numbers of patients so results should be regarded cautiously. There are differences between the apparent dosing of the different jurisdictions. New South Wales and Queensland have 'grams per episode' about 10% below the Australian average whereas South Australia and Western Australia have 'grams per episode' about 20% above.

Table 19 Total national numbers chronic inflammatory demyelinating polyneuropathy

	Sep Q08	Dec Q08	Mar Q09	Jun Q09	Sep Q09	Dec Q09	Mar Q10	Jun Q10	Sep Q10	Dec Q10	Mar Q11	Jun Q11
NSW	315	332	353	376	390	386	408	418	421	432	443	442
Vic.	226	240	243	237	245	254	249	253	253	252	266	273
Qld.	162	167	167	195	189	200	219	210	208	225	222	241
WA	59	60	64	71	73	66	65	74	75	71	70	73
SA	35	38	42	41	44	49	49	50	49	46	49	52
Tas.	29	30	31	32	32	32	33	31	29	32	30	24
ACT	11	11	14	12	12	11	11	13	12	12	13	11
NT	1	1	1	2	1	0	2	2	2	1	0	0
Australia	838	879	915	966	986	998	1036	1051	1049	1071	1093	1116

Source: IVIg Stars database maintained by the Blood Service.

Figure 33Chronic inflammatory demyelinating polyneuropathy - grams per episode

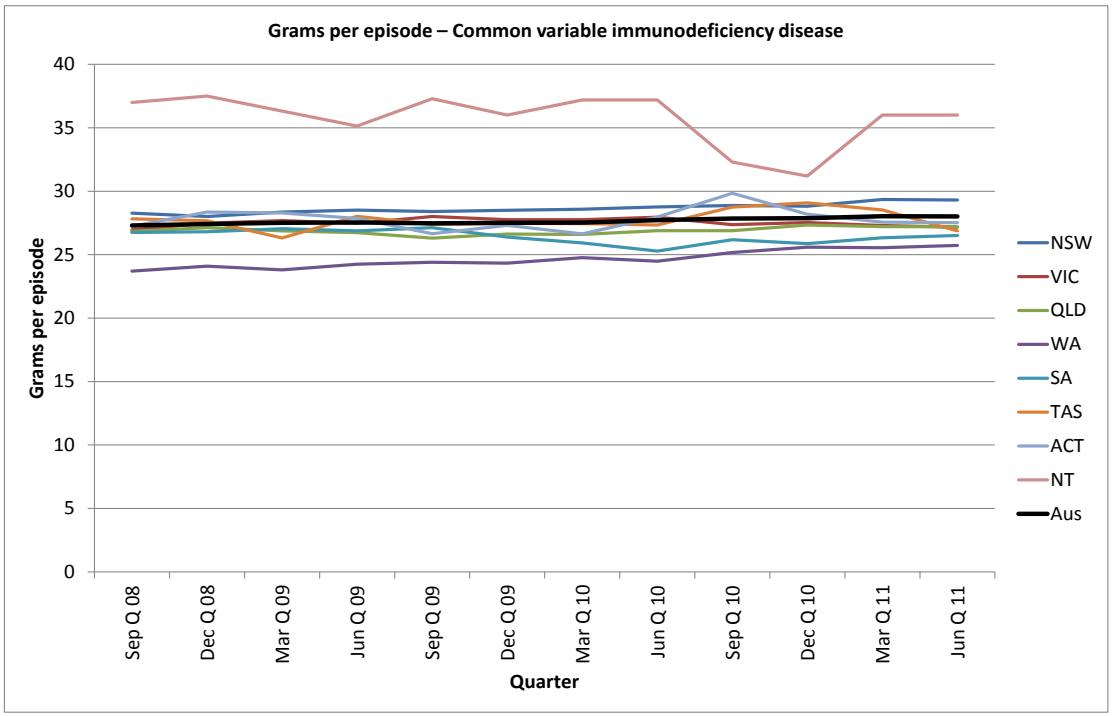


Source: IVIg Stars database maintained by the Blood Service.

8.2.2. COMMON VARIABLE IMMUNODEFICIENCY DISEASE (CVID)

For CVID Figure 34 shows most of the larger jurisdictions are clustered around the Australian average. Western Australia is below the average starting at -13% of the average at the beginning of the period and ending at -8% of the average at the end of the period.

Figure 34 Common variable immunodeficiency disease - grams per episode



Source: IVIg Stars database maintained by the Blood Service.

Table 20 Total national numbers common variable immunodeficiency disease

	Sep Q08	Dec Q08	Mar Q09	Jun Q09	Sep Q09	Dec Q09	Mar Q10	Jun Q10	Sep Q10	Dec Q10	Mar Q11	Jun Q11
NSW	431	443	437	449	450	456	469	484	498	502	500	510
Vic.	155	170	178	178	181	179	181	186	193	192	195	200
Qld.	197	199	204	210	219	220	220	218	223	223	225	232
WA	63	65	60	63	66	60	55	54	53	53	55	54
SA	64	66	79	79	84	87	89	91	94	92	96	97
Tas.	6	11	12	15	14	15	15	15	15	16	16	17
ACT	28	28	26	28	31	31	33	36	36	40	43	46
NT	2	2	0	3	2	3	2	2	4	3	1	1
Australia	946	984	996	1025	1047	1051	1064	1086	1116	1121	1131	1157

Source: IVIg Stars database maintained by the Blood Service.

8.2.3. CHRONIC LYMPHOCYTIC LEUKAEMIA (CLL)

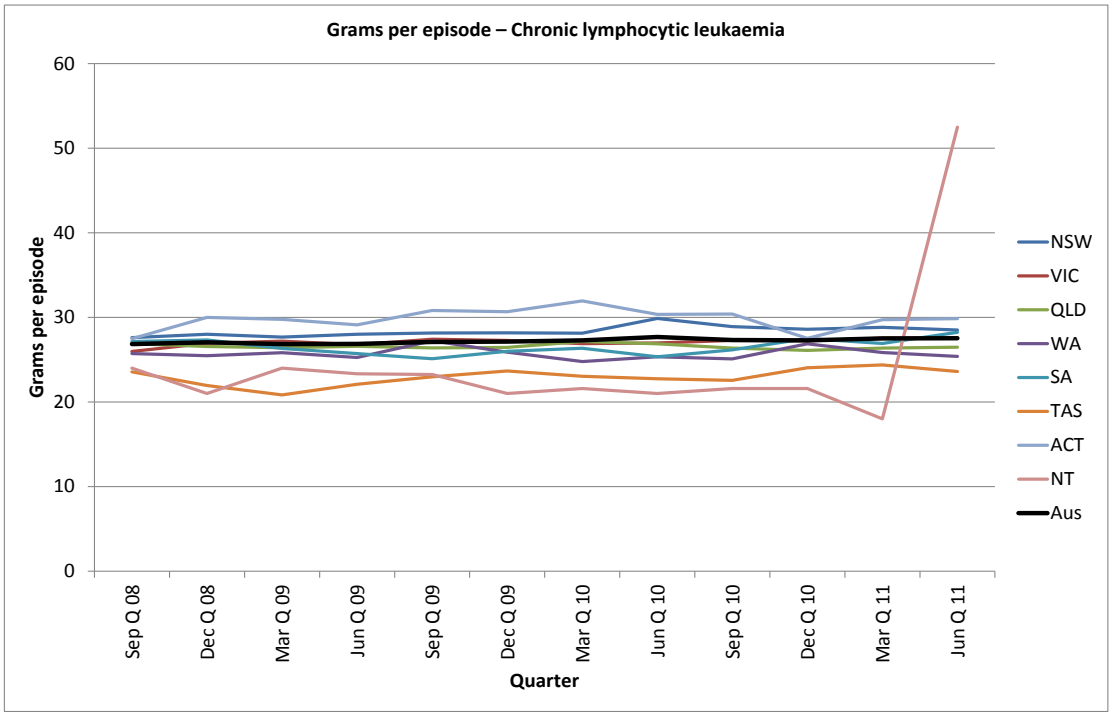
For CCL Figure 35 shows most of the larger jurisdictions are clustered around the Australian average.

Table 21 Total national numbers chronic lymphocytic leukaemia

	Sep Q08	Dec Q08	Mar Q09	Jun Q09	Sep Q09	Dec Q09	Mar Q10	Jun Q10	Sep Q10	Dec Q10	Mar Q11	Jun Q11
NSW	236	244	242	256	260	257	259	254	271	284	280	285
Vic.	142	151	148	157	150	156	167	161	168	168	165	167
Qld.	170	176	181	183	205	200	199	212	205	207	212	222
WA	20	19	20	24	23	24	22	23	27	29	25	23
SA	48	58	60	60	61	64	59	61	62	56	50	55
Tas.	26	25	21	22	21	19	19	23	25	25	26	25
ACT	9	8	7	10	10	13	14	16	19	17	15	14
NT	1	2	1	4	3	2	2	2	2	2	1	2
Australia	652	683	680	716	733	735	741	752	779	788	774	793

Source: IVIg Stars database maintained by the Blood Service.

Figure 35 Chronic lymphocytic leukaemia - grams per episode



Source: IVIg Stars database maintained by the Blood Service.

8.2.4. MYASTHENIA GRAVIS

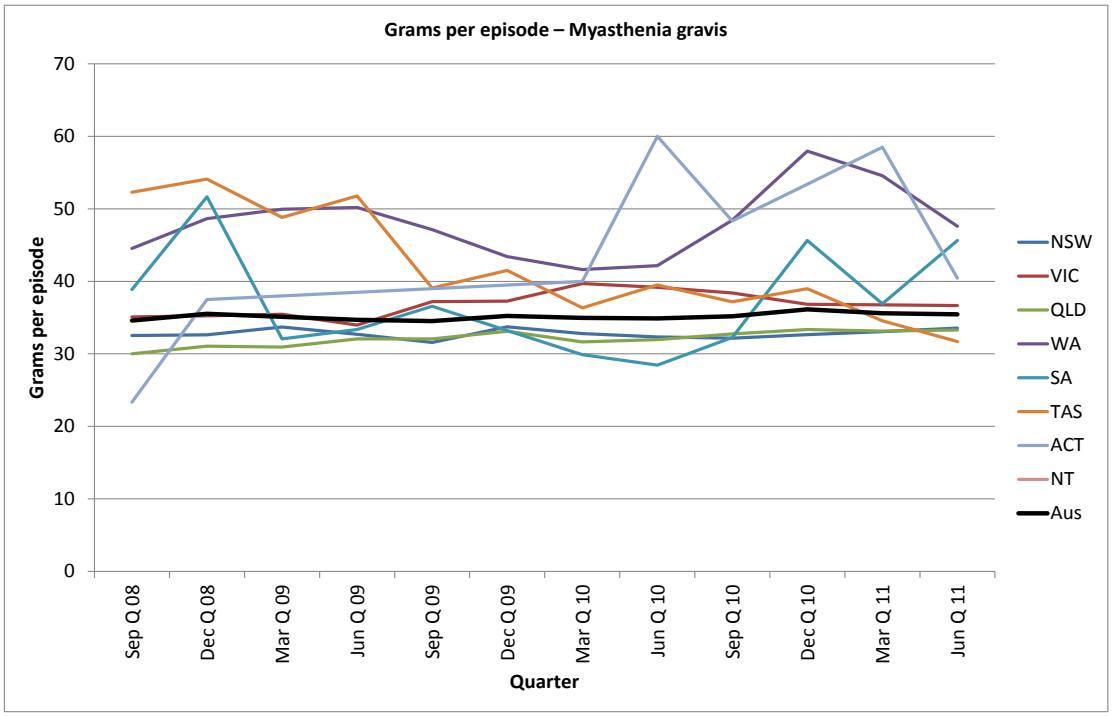
The picture for myasthenia gravis shown in Figure 36 shows a higher level of variability. The numbers of patients for this condition are quite small and this may explain the divergence.

Table 22 Total national numbers Myasthenia gravis

	Sep Q08	Dec Q08	Mar Q09	Jun Q09	Sep Q09	Dec Q09	Mar Q10	Jun Q10	Sep Q10	Dec Q10	Mar Q11	Jun Q11
NSW	92	93	99	106	120	129	133	128	126	132	136	141
Vic.	51	50	56	65	65	66	71	73	70	75	82	88
Qld.	54	58	64	78	80	90	79	78	91	94	97	109
WA	27	25	24	24	23	21	21	21	23	27	28	25
SA	10	8	15	9	16	11	9	10	10	9	8	16
Tas.	12	10	11	9	10	10	9	9	11	10	10	11
ACT	1	1	0	0	0	0	1	1	3	2	2	4
NT	0	0	0	0	0	0	0	0	0	0	0	0
Australia	247	245	269	291	314	327	323	320	334	349	363	394

Source: IVIg Stars database maintained by the Blood Service.

Figure 36 Myasthenia gravis - grams per episode



Source: IVIg Stars database maintained by the Blood Service.

8.2.5. MULTIPLE MYELOMA

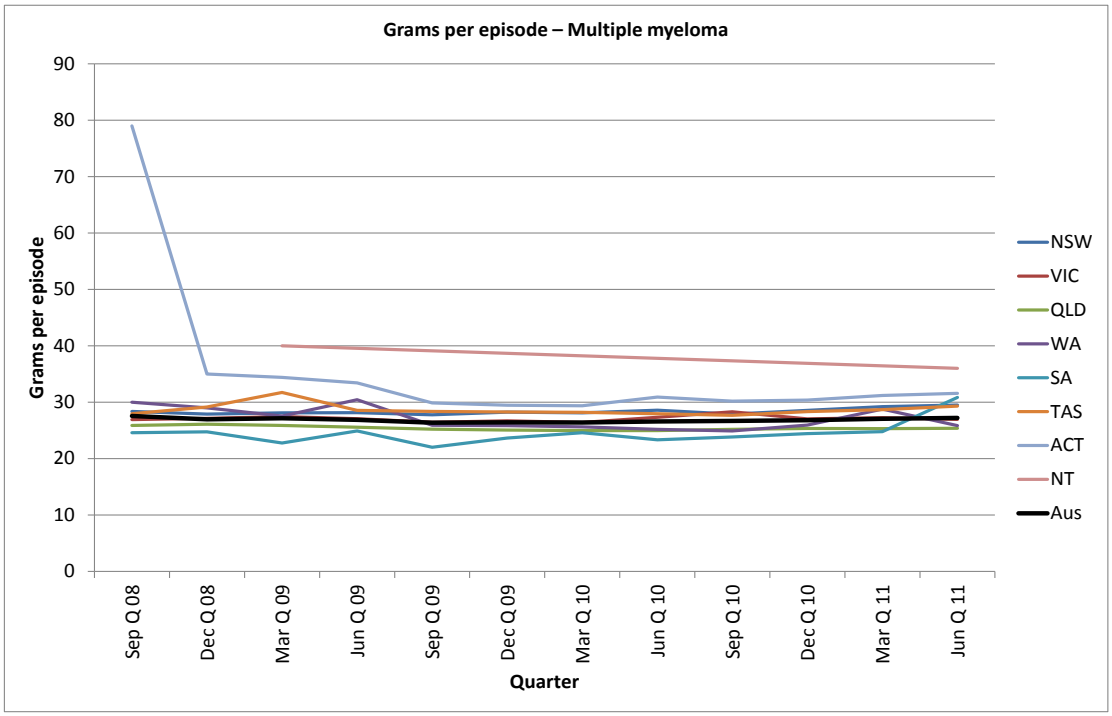
Figure 37 shows a quite dispersed picture. Western Australia and South Australia are more than 30% above and New South Wales and Queensland more than 10% below the national average.

Table 23 Total national numbers Multiple myeloma

	Sep Q08	Dec Q08	Mar Q09	Jun Q09	Sep Q09	Dec Q09	Mar Q10	Jun Q10	Sep Q10	Dec Q10	Mar Q11	Jun Q11
NSW	146	142	136	153	157	176	173	177	192	194	174	190
Vic.	73	75	66	73	71	67	81	81	103	106	107	95
Qld.	188	197	191	201	213	217	215	230	244	250	245	252
WA	5	6	5	6	9	8	13	10	12	8	8	10
SA	12	14	13	10	10	15	15	13	12	9	6	7
Tas.	11	21	31	35	37	35	37	40	44	42	44	42
ACT	5	3	5	5	7	10	10	10	17	14	14	12
NT	0	0	1	0	0	0	0	0	0	0	0	1
Australia	440	458	448	483	504	528	544	561	624	623	598	609

Source: IVIg Stars database maintained by the Blood Service.

Figure 37 Multiple myeloma - grams per episode



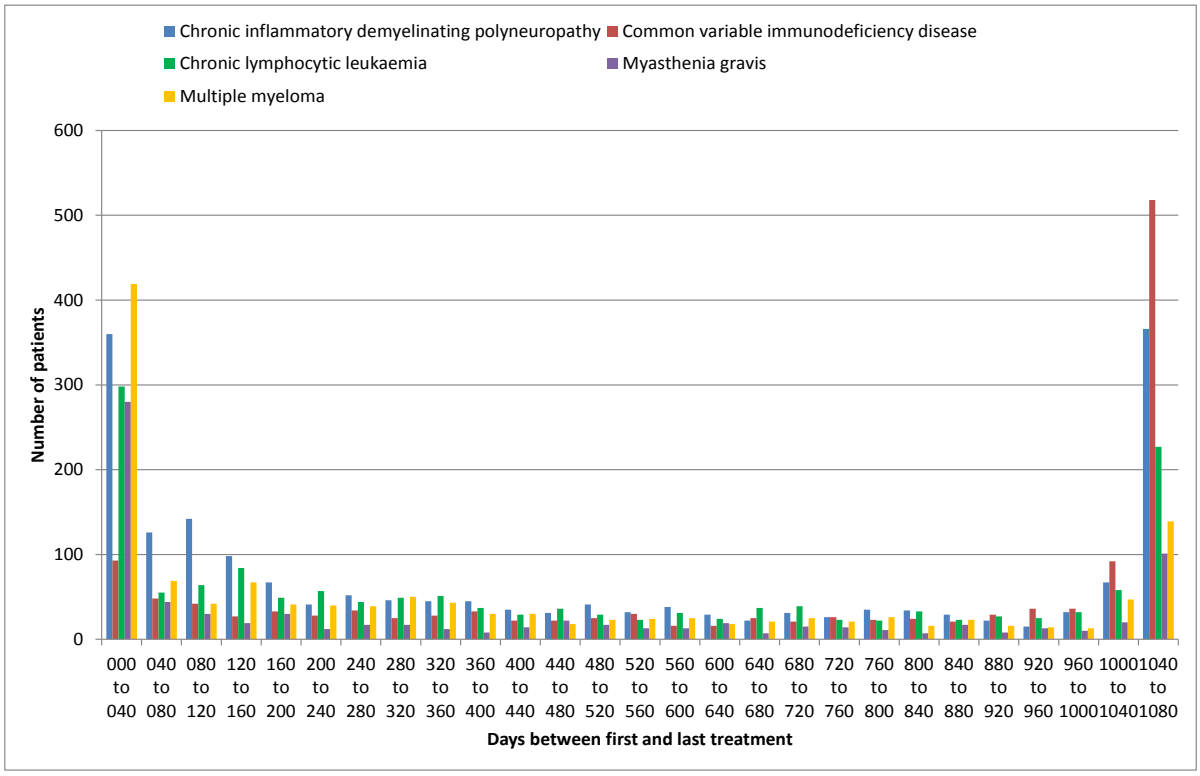
Source: IVIg Stars database maintained by the Blood Service.

8.3. TIME IN TREATMENT

Patients requiring IVIg may have a condition requiring only very short term IVIg treatments (e.g. Kawasaki's disease) or may suffer from a condition requiring chronic IVIg treatment and where it may be necessary to have IVIg for the rest of their life. For each unique patient and diagnosis we have estimated the time in treatment as the number of days between the recorded first date when IVIg was issued and last date it was issued for that patient. A patient first recorded in the last quarter will have a maximum possible difference of about 90 days. In this calculation, a patient who has a chronic condition receiving IVIg since the first quarter of 2008/09 could have days in treatment of up to 730 days.

We have looked at the five conditions for which the largest amount of IVIg is issued for each those conditions classified as short term and long term.

Figure 38 Days in treatment selected long term conditions

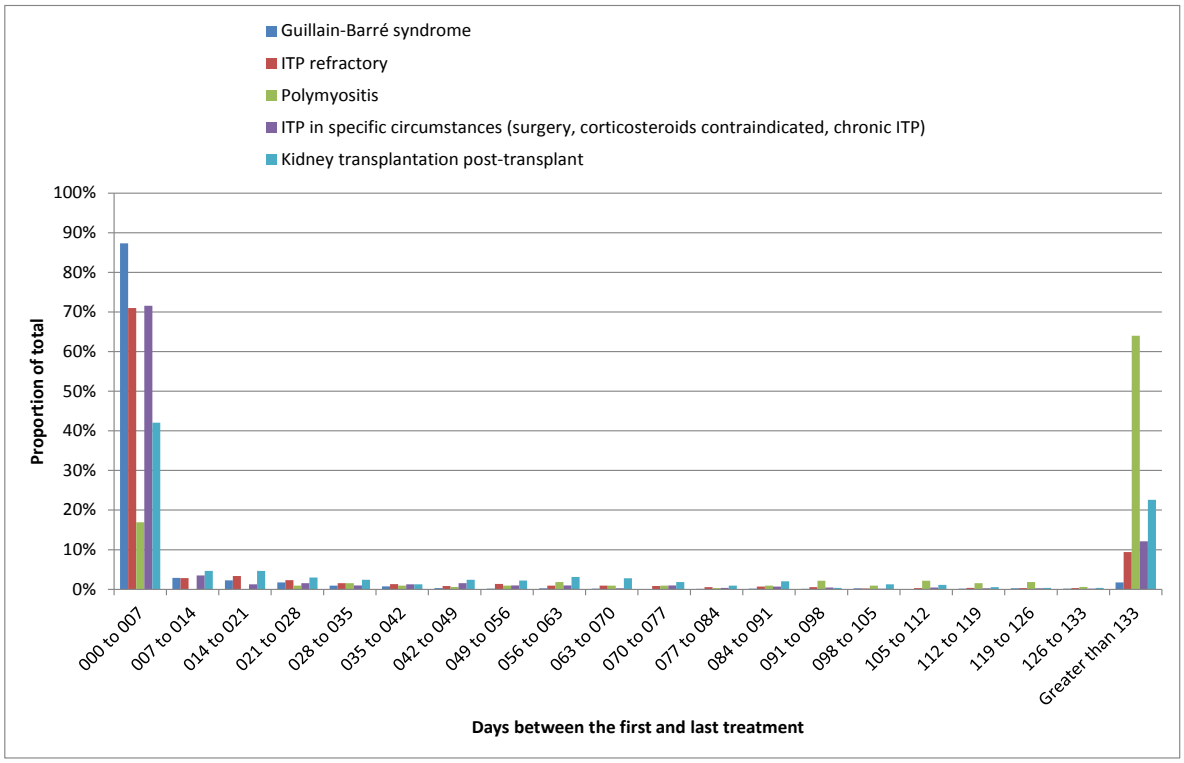


Source: IVIg Stars database maintained by the Blood Service.

Note: The groups of days "n to m" is greater than n and less than or equal to m.

The distributions shown in Figure 38 reflect a large number of patients that had IVIg throughout the period, the new patients joining in each quarter (most of whom continue to receive IVIg) and some patients that receive IVIg for a short period only despite their condition being of a longer term nature. The data also reflect the poor prognoses of some of the patients with chronic lymphocytic leukaemia (CLL). No data exists to classify the ceased patients by outcome of treatment.

Figure 39 Days in treatment selected short term conditions

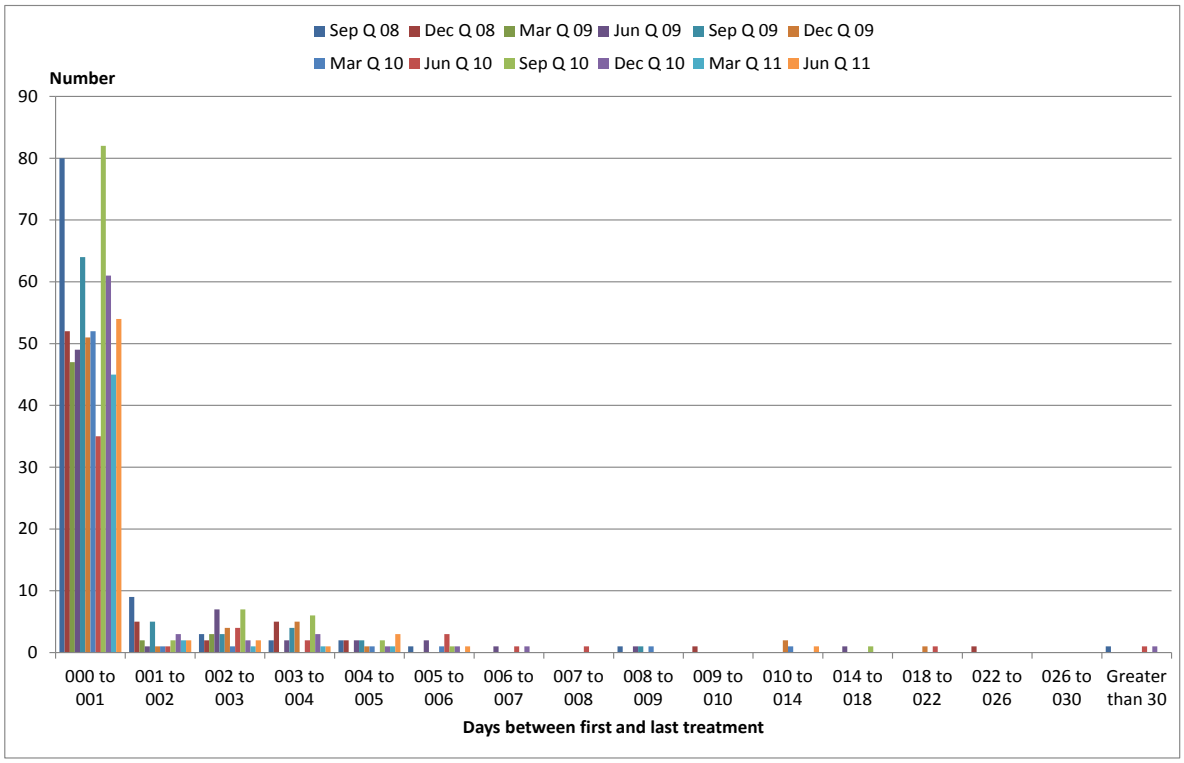


Source: IVIg Stars database maintained by the Blood Service.

Note: Polymyositis, while it is treated in short term bursts, is subject to relapses. Which is reflected in the large numbers in the Greater than 133 days category.
The groups of days “n to m” is greater than n and less than or equal to m.

For conditions considered short term, most patients receive treatment with IVIg for less than a week. However, it is of interest to note that 55% of patients who received IVIg for kidney transplants post-transplant received IVIg long term and less than 20% of patients receiving IVIg for polymyositis had treatment courses less than a week. Figure 40 shows the treatment periods for Kawasaki disease. The vast majority receive treatment with IVIg for only one day and a few receive additional treatments.

Figure 40 Days in treatment for Kawasaki disease by quarter of first joining



Source: IVIg Stars database maintained by the Blood Service.

Note: The groups of days “n to m” is greater than n and less than or equal to m.

9. CONCLUSIONS

The data that are available raise a number of questions regarding the use of IVIg in Australia. Most significantly are:

- Why is Australia's demand for IVIg per 1000 population higher than many other countries with similar, well developed health care systems?
- Are patient outcomes in the different countries equivalent? Is Australia seeing patient benefits from the higher use?
- What are the clinical factors influencing the continued increase in the rate of ordering within neurology?
- What are the known causes for the variability in per head of population use of IVIg between conditions and between jurisdictions?

Gaps in the data that need to be addressed to better understand drivers of demand include:

- recording of each IVIg use event, as this would provide a basis for better analysis of IVIg use
- inclusion of high quality demographic (such as height, weight and age) data for all patients
- IVIg efficacy and patient outcomes.

APPENDIX A
IVIG BY GRAMS PER 1000 HEAD OF POPULATION - 2010/11 BY JURISDICTION AND PRIMARY DIAGNOSIS

Disease Category	Primary Diagnosis	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Grand Total
Chapter 5	Chronic inflammatory demyelinating polyneuropathy	26.99	29.20	25.07	27.19	18.04	38.82	20.37	3.07	26.42
	Chronic lymphocytic leukaemia	11.41	8.60	13.19	2.96	9.70	13.36	15.36	2.06	10.09
	Common variable immunodeficiency disease	24.05	12.14	16.17	7.64	17.77	10.74	43.82	3.91	17.14
	Dermatomyositis	1.68	1.36	0.38	0.60	1.91	3.94	2.24	0.00	1.28
	Guillain-Barré syndrome	4.57	5.68	4.19	2.80	4.05	3.34	3.57	0.00	4.45
	Hypogammaglobulinaemia Unclassified	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Inclusion body myositis	1.77	0.69	0.94	0.00	1.17	4.22	0.00	0.00	1.11
	ITP associated with HIV	0.04	0.07	0.18	0.00	0.00	0.00	0.00	0.00	0.07
	ITP in pregnancy	0.73	0.21	0.37	0.25	0.43	0.30	1.16	1.30	0.46
	ITP in specific circumstances (surgery, corticosteroids contraindicated, chronic ITP)	2.76	2.30	3.89	1.10	3.28	0.74	2.05	1.94	2.68
	ITP refractory	3.16	2.33	4.45	2.40	2.25	2.61	7.20	3.06	3.12
	ITP with life-threatening haemorrhage	1.83	0.06	0.39	0.06	2.68	0.20	0.40	0.31	0.90
	Kawasaki disease	0.70	0.57	0.40	0.28	0.52	0.39	0.60	0.00	0.53
	Lambert-Eaton myasthenic syndrome	0.32	0.10	0.17	0.00	0.14	0.00	0.00	0.00	0.17

Disease Category	Primary Diagnosis	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Grand Total
	Multifocal motor neuropathy with persistent conduction block	7.57	7.27	6.00	12.29	10.84	1.69	1.16	13.38	7.73
	Multiple myeloma	6.94	5.02	16.24	0.99	1.33	26.80	12.90	0.31	7.80
	Myasthenia gravis	8.18	8.61	11.08	7.61	2.74	11.52	5.68	0.00	8.37
	Neonatal haemochromatosis	0.00	0.42	1.02	0.00	0.00	0.00	0.00	0.00	0.31
	Non-Hodgkins lymphoma	5.92	4.57	14.54	1.13	4.41	10.43	14.82	0.00	6.92
	Other primary immunodeficiency	2.11	2.10	0.43	1.30	1.07	0.66	0.03	2.28	1.54
	Other relevant haematological malignancies	4.49	2.72	3.26	1.20	0.46	3.63	1.42	0.30	3.05
	Polymyositis	5.19	3.11	3.99	0.45	4.84	2.16	1.92	0.00	3.74
	Severe combined Immunodeficiency	0.01	0.33	1.66	0.00	0.00	0.00	0.00	0.00	0.42
	Stiff person syndrome	0.71	0.44	1.71	0.00	0.30	1.19	0.00	0.90	0.74
	Wiskott-Aldrich syndrome	0.03	0.01	0.08	0.17	0.09	0.32	0.00	0.00	0.06
	X linked agammaglobulinaemia	0.70	2.83	1.14	0.90	1.20	0.00	1.09	0.00	1.36
Chapter 5 Total		121.85	100.75	130.93	71.30	89.22	137.05	135.78	32.81	110.49
Chapter 6	Acute disseminated encephalomyelitis	0.59	0.04	0.17	0.05	0.07	0.29	0.00	0.00	0.25
	ANCA (PR3 or MPO)-positive idiopathic rapidly progressive glomerulonephritis	0.03	0.05	0.09	0.05	0.00	0.00	0.00	0.00	0.04
	Autoimmune haemolytic anaemia	0.41	0.59	1.02	0.23	0.55	0.49	0.53	0.00	0.57

Disease Category	Primary Diagnosis	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Grand Total
	Bullous pemphigoid	0.44	0.16	0.13	0.00	0.15	0.00	0.00	0.00	0.22
	Cicatricial pemphigoid	0.29	0.21	0.85	0.00	0.00	0.00	2.70	0.00	0.36
	Evans syndrome	0.08	0.00	0.04	0.06	0.12	0.00	0.00	0.00	0.05
	Foeto-maternal /neonatal alloimmune thrombocytopenia (Antenatal)	0.07	0.52	1.04	1.45	0.22	0.00	0.02	0.00	0.53
	Foeto-maternal /neonatal alloimmune thrombocytopenia (Neonatal)	0.04	0.01	0.00	0.01	0.52	0.00	0.00	0.03	0.05
	Haemophagocytic syndrome	0.19	0.27	0.39	0.00	0.02	0.21	0.00	0.00	0.21
	HSCT (for prevention of GvHD in high risk Allogeneic HSCT).	0.17	1.96	6.19	0.02	3.12	0.00	0.00	0.00	2.03
	IgG subclass deficiency EXISTING patients only	5.24	1.84	1.13	0.71	2.49	4.56	2.69	0.00	2.78
	Ig para-proteinaemic neuropathy	0.61	0.34	0.44	0.97	0.54	0.00	0.00	0.00	0.51
	ITP in children	0.21	0.38	0.41	0.04	0.47	0.12	0.06	1.41	0.30
	Kidney transplantation post-transplant	0.94	6.65	1.27	1.04	0.49	3.08	1.21	0.00	2.44
	Kidney transplantation pre-transplant	0.38	0.90	0.02	0.02	0.07	0.00	0.00	0.00	0.36
	Microscopic polyangiitis	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.01
	Multiple sclerosis - severe relapse with no response to high dose methylprednisolone	0.07	0.11	0.35	0.00	0.00	1.50	0.00	0.00	0.16
	Multiple sclerosis in pregnancy	0.04	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.02

Disease Category	Primary Diagnosis	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Grand Total
	Multiple sclerosis in young patients severe/relapsing/remitting in whom other therapies have failed	0.01	0.00	0.16	0.00	0.00	0.72	0.00	0.00	0.05
	Opsoclonus myoclonus ataxia	0.08	0.10	0.01	0.20	0.13	0.00	0.00	0.00	0.08
	Pemphigus foliaceus	0.20	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	Pemphigus vulgaris	0.56	0.26	0.63	0.29	0.99	0.00	0.00	0.00	0.48
	Post transfusion purpura	0.01	0.04	0.00	0.06	0.00	0.00	0.00	0.00	0.02
	Secondary hypogammaglobulinaemia (excludes haematological malignancies)	2.93	2.36	6.90	1.30	1.26	13.08	1.42	1.08	3.49
	Specific antibody deficiency	1.52	0.86	1.74	3.13	1.71	0.32	4.89	0.77	1.60
	Toxic epidermal necrolysis/Steven Johnson syndrome	0.36	0.44	0.06	0.13	0.17	1.18	0.31	0.46	0.30
	TSS - staphylococcal	0.23	0.11	0.08	0.09	0.04	0.00	1.09	0.00	0.15
	TSS - streptococcal	0.30	0.45	0.49	0.11	0.00	0.06	0.88	0.64	0.34
	Wegener’s granulomatosis	0.04	0.04	0.00	0.00	0.19	0.00	0.00	0.00	0.04
Chapter 6 Total		16.03	18.71	23.69	9.96	13.32	25.61	15.79	4.40	17.52
Chapter 7	Acute leukaemia in children	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Autoimmune congenital heart block	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.01
	Autoimmune diabetic neuropathy	0.11	0.04	0.00	0.00	0.00	3.00	0.00	0.00	0.11

Disease Category	Primary Diagnosis	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Grand Total
	Autoimmune neutropenia	0.26	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.11
	Catastrophic antiphospholipid syndrome	0.13	0.03	0.24	0.14	0.24	0.00	0.00	0.00	0.13
	Coagulation factor inhibitors	0.12	0.02	0.35	0.00	0.29	0.00	0.00	0.94	0.15
	Devic disease (neuromyelitis optica)	0.31	0.01	0.13	0.03	0.00	0.65	0.00	0.00	0.15
	Epidermolysis bullosa acquisita	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.03
	Epilepsy (rare childhood cases)	0.15	0.68	0.58	0.58	0.00	0.00	0.00	0.00	0.39
	Graves ophthalmopathy	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Haemolytic disease of the newborn	0.42	0.23	0.92	0.02	0.04	0.01	0.06	0.00	0.38
	Haemolytic transfusion reaction	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
	Myocarditis in children	0.01	0.03	0.07	0.09	0.00	0.00	0.00	0.00	0.04
	Paraneoplastic syndromes	0.29	0.38	0.10	0.54	0.10	0.28	1.73	0.00	0.31
	Potassium channel antibody-associated encephalopathy	0.45	0.38	0.15	0.13	0.80	0.21	0.93	0.00	0.36
	Pure red cell aplasia	0.09	0.20	0.32	0.12	0.09	2.76	0.00	0.00	0.22
	Pure white cell aplasia	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.01
	Scleromyxedema	0.23	0.15	0.00	0.31	0.00	0.00	0.00	0.00	0.14
	Sepsis - neonatal	0.01	0.02	0.01	0.00	0.00	0.01	0.00	0.01	0.01

Disease Category	Primary Diagnosis	NSW	Vic.	Qld.	WA	SA	Tas.	ACT	NT	Grand Total
	Sjogren's Syndrome	0.20	0.00	0.19	0.33	0.90	0.00	2.30	0.00	0.24
	Solid organ - heart	0.05	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.03
	Solid organ - heart/lung	0.02	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.02
	Solid organ - liver	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01
	Solid organ - lung	0.60	0.18	0.17	0.00	0.40	0.61	0.00	0.51	0.32
	Solid organ - other	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.01
	Susac syndrome	0.32	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.16
Chapter 7 Total		3.78	2.43	3.83	2.65	2.90	7.52	5.03	1.47	3.35
Chapter 8	Asthma	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.09
	Atopic dermatitis/eczema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Recurrent foetal loss (with or without antiphospholipid syndrome)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Systemic lupus erythematosus	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.02
Chapter 8 Total		0.00	0.37	0.00	0.20	0.00	0.00	0.00	0.00	0.11
DO	DO issue	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Grand Total		141.66	122.30	158.46	84.11	105.44	170.17	156.60	38.68	131.48

APPENDIX B
IVIG AVERAGE GRAM PER EPISODE ISSUED FOR 2010/11 BY JURISDICTION AND PRIMARY DIAGNOSIS

Disease Category	Primary Diagnosis	ACT	NSW	NT	Qld.	SA	Tas.	Vic.	WA	Grand Total
Chapter 5	Chronic inflammatory demyelinating polyneuropathy	46.98	32.78	40.53	32.36	43.48	51.03	35.78	46.37	35.79
	Chronic lymphocytic leukaemia	29.83	28.39	23.90	26.55	26.46	22.99	27.11	25.77	27.22
	Common variable immunodeficiency disease	27.79	28.68	34.97	26.89	26.41	27.78	27.54	24.63	27.67
	Dermatomyositis	46.91	29.24		28.85	42.72	83.15	40.75	51.07	35.73
	Guillain-Barré syndrome	33.18	31.69	81.38	29.92	41.25	39.52	32.38	59.41	33.47
	Hypogammaglobulinaemia Unclassified							70.00		70.00
	Idiopathic thrombocytopenic purpura - Adult				25.00					25.00
	Inclusion body myositis	72.00	32.75		35.93	39.74	38.44	33.71	60.00	34.71
	ITP associated with HIV	96.14	29.04		36.94			55.56	80.00	39.14
	ITP in pregnancy	70.00	39.79	50.14	30.37	48.47	44.40	49.24	66.36	41.68
	ITP in specific circumstances (surgery, corticosteroids contraindicated, chronic ITP)	76.60	36.20	74.53	31.52	59.74	62.89	50.88	61.26	40.26
	ITP refractory	69.51	37.36	79.59	31.82	59.91	51.21	51.97	61.85	41.07
	ITP with life-threatening haemorrhage	80.11	37.63	52.00	34.83	61.23	71.25	65.38	74.88	41.87
	Kawasaki disease	37.88	32.49	21.86	33.91	32.89	26.31	31.22	29.46	32.04

Disease Category	Primary Diagnosis	ACT	NSW	NT	Qld.	SA	Tas.	Vic.	WA	Grand Total
	Lambert-Eaton myasthenic syndrome		33.38	39.00	25.07	225.00		35.36	63.00	33.59
	Multifocal motor neuropathy with persistent conduction block	23.14	33.73	83.52	30.49	50.59	34.91	38.30	55.24	38.16
	Multiple myeloma	33.13	28.38	38.40	25.38	24.33	28.63	27.13	26.66	26.83
	Myasthenia gravis	44.00	32.81		32.32	36.80	41.10	36.99	47.89	35.19
	Neonatal haemochromatosis		73.89		70.84	3.00		57.31	68.57	67.98
	Non-Hodgkins lymphoma	28.50	28.34	36.00	25.29	26.18	26.21	28.97	28.71	26.94
	Other primary immunodeficiency	17.90	26.34	20.06	23.10	35.07	24.40	28.23	23.68	26.74
	Other relevant haematological malignancies	28.72	27.77	25.80	25.14	21.72	27.08	27.60	22.17	26.73
	Polymyositis	38.34	31.09	40.13	33.38	47.62	55.29	43.73	42.32	35.58
	Severe combined Immunodeficiency		15.00		25.39	3.00		20.37		23.49
	Stiff person syndrome		41.08	21.00	60.98	46.93	35.33	40.85	66.00	47.77
	Wiskott-Aldrich syndrome		16.29		23.30	14.25	33.00	7.42	26.13	21.20
	X linked agammaglobulinaemia	13.50	22.46		24.61	25.60	27.00	26.64	22.43	24.99
Chapter 5 Total		32.71	30.71	47.12	28.76	35.63	35.65	32.81	40.24	31.67
Chapter 6	Acute disseminated encephalomyelitis	3.00	32.02		28.47	37.23	30.94	30.42	42.24	32.32
	ANCA (PR3 or MPO)-positive idiopathic rapidly progressive glomerulonephritis		36.63		24.45			25.63	38.63	29.70

Disease Category	Primary Diagnosis	ACT	NSW	NT	Qld.	SA	Tas.	Vic.	WA	Grand Total
	Autoimmune haemolytic anaemia	75.77	34.86		33.06	56.81	79.00	52.65	63.78	40.70
	Bullous pemphigoid		55.63		27.00	255.00		59.53	30.00	49.55
	Churg-Strauss syndrome		21.00						144.00	41.50
	Cicatricial pemphigoid	65.40	65.18		44.02			116.63		60.56
	Evans syndrome	35.00	31.22		19.88	68.50		51.00	55.25	31.37
	Foeto-maternal /neonatal alloimmune thrombocytopenia (Antenatal)	6.00	75.79		70.24	55.68	3.39	63.95	73.20	49.64
	Foeto-maternal /neonatal alloimmune thrombocytopenia (Neonatal)		11.39	5.50	3.23	60.78	3.00	34.82	3.25	33.32
	Haemophagocytic syndrome		37.33		31.18	27.42	47.00	47.99	9.86	38.40
	HSCT (for prevention of GvHD in high risk Allogeneic HSCT).		26.34		23.28	43.61		30.17	31.50	25.65
	IgG subclass deficiency EXISTING patients only	22.81	26.92		20.94	29.19	26.08	27.13	25.65	26.25
	Ig para-proteinaemic neuropathy		30.84		30.67	25.14	120.00	35.19	52.14	34.11
	ITP in children	22.60	24.16	40.09	27.23	29.93	13.50	24.08	28.39	26.27
	Kidney transplantation post-transplant	39.14	26.88		15.07	25.36	42.09	32.90	66.50	30.33
	Kidney transplantation pre-transplant		40.22		13.04	18.53		21.94	24.90	24.74
	Microscopic polyangiitis		30.00		23.40			36.67	48.90	37.72

Disease Category	Primary Diagnosis	ACT	NSW	NT	Qld.	SA	Tas.	Vic.	WA	Grand Total
	Multiple sclerosis - severe relapse with no response to high dose methylprednisolone		33.26		33.13		40.16	22.22		30.11
	Multiple sclerosis in pregnancy		29.33		30.00					29.57
	Multiple sclerosis in young patients severe/relapsing/remitting in whom other therapies have failed		17.50		27.66	33.00	34.71	35.00		26.19
	Opsoclonus myoclonus ataxia		29.43		35.45	26.33	27.50	19.52	22.73	24.36
	Pemphigus foliaceus		70.07					66.00		69.29
	Pemphigus vulgaris		52.97		40.93	85.48		57.84	138.00	55.85
	Post transfusion purpura		45.94		35.00	27.60		64.25	75.00	46.55
	Secondary hypogammaglobulinaemia (excludes haematological malignancies)	32.71	25.71	34.13	23.92	22.08	35.74	26.00	19.70	24.99
	Specific antibody deficiency	20.99	23.78	8.19	20.61	25.78	26.75	26.84	23.32	23.28
	Toxic epidermal necrolysis/Steven Johnson syndrome	22.80	43.46	54.00	36.43	85.88	70.95	63.80	93.60	55.09
	TSS - staphylococcal	66.25	65.58	88.00	47.34	80.00	70.00	52.38	81.85	60.31
	TSS - streptococcal	92.25	86.00	150.00	62.28	59.29	128.25	76.17	151.00	75.12
	Wegener’s granulomatosis		31.09		38.54	24.00	111.00	47.22	24.00	37.44
Chapter 6 Total		28.49	29.09	21.85	24.77	32.90	28.86	32.61	30.51	28.84

Disease Category	Primary Diagnosis	ACT	NSW	NT	Qld.	SA	Tas.	Vic.	WA	Grand Total
Chapter 7	Acute leukaemia in children		12.00		12.48	13.50	5.00	14.79	15.00	12.87
	Autoimmune congenital heart block				60.00			62.50		61.07
	Autoimmune diabetic neuropathy		22.32		30.00	17.40	77.24	50.49		44.83
	Autoimmune neutropenia		58.46		33.21			37.00	34.00	43.20
	Catastrophic antiphospholipid syndrome	120.00	37.48		32.64	66.68		47.71	66.00	41.94
	Coagulation factor inhibitors		40.65	73.00	36.76	47.53		57.59	45.78	43.73
	Devic disease (neuromyelitis optica)		32.02		22.97		30.00	31.64	71.67	30.71
	Epidermolysis bullosa acquisita								64.80	64.80
	Epilepsy (rare childhood cases)		31.34		27.61		66.00	36.81	33.64	32.93
	Graves ophthalmopathy		35.00					45.00		36.74
	Haemolytic disease of the newborn	2.81	17.41	3.00	76.50	3.32	3.00	14.20	3.00	22.82
	Haemolytic transfusion reaction	3.00	30.00					50.00	85.00	36.78
	Myocarditis in children		27.75		63.46	17.50		15.38	52.13	32.71
	PANDAS/tic disorders							24.00		24.00
	Paraneoplastic syndromes	37.06	32.39		25.07	29.27	18.00	29.97	50.41	32.95
	Potassium channel antibody-associated encephalopathy	30.64	29.48		28.26	39.61	27.00	34.65	46.92	32.83

Disease Category	Primary Diagnosis	ACT	NSW	NT	Qld.	SA	Tas.	Vic.	WA	Grand Total
	Pure red cell aplasia		36.63		30.50	39.33	39.74	40.18	34.70	35.44
	Pure white cell aplasia				24.96					24.96
	Scleromyxedema	36.00	38.92		35.40			21.35	106.13	30.24
	Sepsis - neonatal		3.05	3.00	4.50	3.00	3.00	3.10	3.00	3.25
	Sjogren's Syndrome	32.54	29.69		25.87	121.85		37.26	45.53	43.00
	Solid organ - heart		20.09		18.00	18.00		38.72	150.00	25.11
	Solid organ - heart/lung		37.85		28.36	35.54		36.00		32.99
	Solid organ - liver		21.00		28.50			21.15		22.06
	Solid organ - lung		32.87	120.00	26.05	48.65	28.32	29.69	69.00	31.56
	Solid organ - other				10.22			25.60		12.30
	Solid organ - pancreas							7.50		7.50
	Susac syndrome		32.62		48.39			41.81		38.66
Chapter 7 Total		28.39	29.32	49.71	32.74	45.18	46.94	29.11	42.74	32.50
Chapter 8	Acute optic neuritis									
	Amegakaryocytic thrombocytopenia									
	Asthma							38.33		38.33
	Atopic dermatitis/eczema				27.00					27.00

Disease Category	Primary Diagnosis	ACT	NSW	NT	Qld.	SA	Tas.	Vic.	WA	Grand Total
	Female infertility							27.00		27.00
	Paraneoplastic cerebellar degeneration (Yo antibodies)								102.50	102.50
	Recurrent foetal loss (with or without antiphospholipid syndrome)									
	Sepsis (other than neonatal sepsis)							56.88		56.88
	Systemic lupus erythematosus								39.00	39.00
Chapter 8 Total					27.00			38.63	45.68	39.67
Chapter DO	DO issue				40.00			33.41	25.00	32.68
Chapter DO Total					40.00			33.41	25.00	32.68
Grand Total		32.12	30.48	43.74	28.14	35.43	34.79	32.71	38.54	31.27