

The General Practice Services Committee

Evaluation of the Full Service Family Practice Incentive Program and the Practice Support Program

**Final Report: Complex Care Incentive Payments:
Fiscal 2008/09**

Prepared by

**Marcus J. Hollander, PhD
Angela Tessaro, BA**

November 2010

This report has been prepared by Hollander Analytical Services Ltd. for the project funder the BC General Practice Services Committee. The authors are solely responsible for the content of the report. The opinions expressed are those of the authors and do not necessarily reflect the views or policies of the GPSC, the BC Ministry of Health Services or the British Columbia Medical Association.



Hollander Analytical Services Ltd.
300 – 895 Fort Street
Victoria, BC, V8W 1H7

Tel: (250) 384-2776
Fax: (250) 389-0105
info@hollanderanalytical.com

TABLE OF CONTENTS

1. Introduction	1
2. Methods	1
3. Findings	2
3.1 Changes in Incentive Billing Structures	2
3.2 Unadjusted Cost Comparisons	4
3.3 Adjusted Cost Comparisons	7
3.3.1 Adjusted Cost Comparisons for Patients on the Registries Plus Patients for Whom an Incentive was Billed	7
3.3.2 Adjusted Cost Comparisons for Patients on The Registries Only	11
3.3.3 Discussion	11
3.4 Combinations of Complex Care Conditions	15
3.5 Additional Analyses	20

1. INTRODUCTION

The General Practice Services Committee (GPSC) has contracted with Hollander Analytical Services Ltd. to conduct an evaluation of incentive payments instituted under the Full Service Family Practice Incentive Program (FSFPIP). As part of the project to evaluate the FSFPIP, a range of analyses have been conducted on administrative health data. This report presents data on Complex Care.

2. METHODS

This analysis focuses on complex care patients. The universe of complex care patients is comprised of those who received GP services for two or more of the seven designated conditions in the fiscal year.¹ Starting in the 2007/08 fiscal year such patients were eligible for complex care incentive payments. Thus, from the defined universe of patients some received incentive based services and some did not. In this report we present data on the differences in costs of health services (MSP, Pharmacare and hospitals) and compare those who did and did not receive incentive based care, primarily for fiscal 2008/09.

In order to maximize the validity of the analysis a number of screens were applied in order to derive comparable populations for analysis. The screens were as follows:

- i. Exclude patients with less than 5 GP services (our standard exclusion criterion to ensure patients in the analysis are active patients).
- ii. Exclude patients at less than RUB 3.
- iii. Exclude people who died in fiscal 2008/09.
- iv. Exclude people who were in a long term care facility at the end of the 2007/08 fiscal year.
- v. Exclude people with expenditures of more than \$100,000 for hospital costs (we wanted to ensure that we were including people living at home, and were not spending inordinate amounts of time in the hospital).
- vi. Exclude people who received services from more than 25 payees in a year.

A wide range of methodological and cost based analyses were conducted for this project. Table 1 provides the distribution of GP services used by complex care patients who did, and did not, receive incentive based care. Table 1 shows the distribution of all patients compared to patients selected for analysis. As can be seen, our procedure of selecting RUBs 3, 4 and 5 patients who had at least five services (i.e., screens i and ii) included 245,672 of a total of

¹ The seven conditions are: Asthma; Cerebrovascular Disease (CVD); Chronic Obstructive Pulmonary Disease (COPD); Chronic Renal Failure (CRF); Congestive Heart Failure (CHF); Diabetes Mellitus; and Ischemic Heart Disease (IH).

288,978 patients or 85% of the patients. Once screens iii to vi noted above were applied, 224,816 patients were included in the analyses conducted for this report.

Table 1: Patients with Complex Care April 2008 to March 2009 by Services

	Number of Patients	Number of Patients					
		Resource Utilization Band					
		0	1	2	3	4	5
All	288,978	2,316	1,664	13,671	145,610	72,502	53,215
GP Services							
0	191	46	8	25	96	11	5
01	5,866	201	869	2,313	2,107	251	125
02	7,863	186	358	2,374	4,369	427	149
03	10,053	166	182	2,024	6,656	813	212
04	12,461	144	100	1,783	8,843	1,256	335
05	14,849	146	58	1,578	10,624	1,992	451
06	16,213	134	36	1,083	11,666	2,669	625
07	17,150	145	16	761	12,077	3,351	800
08	16,525	105	9	459	11,439	3,473	1,040
09	15,774	105	10	318	10,379	3,738	1,224
10 or More	172,033	938	18	953	67,354	54,521	48,249

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

3. FINDINGS

3.1 Changes in Incentive Billing Structures

There were significant changes in how GPs could bill for complex care services between fiscal 2007/08 and 2008/09. Tables 2 and 3 outline the changes between the fiscal years in terms of services and expenditures. The number of incentive services provided and the expenditures for the complex care incentive decreased between fiscal 2007/08 and 2008/09. However, the number of incentives for telephone calls increased significantly. Tables 4 and 5 indicate that the number of GPs billing for incentives, and the number of patients receiving incentive based care, stayed relatively constant over the two fiscal years. However, the number of incentive payments which were billed, and their associated expenditures, decreased significantly.

Table 2: Paid Services and Amounts for Complex Care Incentives

	Total Services	
	200708	200809
Fee Type		
14030 Major Plan	18,029	.
14031 Minor Review	7,232	.
14032 Complex Care Visit	13,925	.
14033 Complex Care Plan	145,795	127,544
14039 Phone Call	1,150	10,790
Total	186,131	138,334

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 3: Paid Services and Amounts for Complex Care Incentives

	Total Amount	
	200708	200809
Fee Type		
14030 Major Plan	1,802,900	.
14031 Minor Review	542,400	.
14032 Complex Care Visit	487,375	.
14033 Complex Care Plan	45,925,425	40,176,360
14039 Phone Call	17,250	161,850
Total	48,775,350	40,338,210

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 4: Practitioner Participation for Complex Care Incentives

	No of Unique GPs	Total		Average	
		Incentive Services	Paid for Incentives	Incentive Services	Paid for Incentives
Year					
200708	2,551	186,131	48,775,350	73.0	19,120.09
200809	2,573	138,334	40,338,210	53.8	15,677.50

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 5: Patient Participation for Complex Care Incentives

	No of Unique Patients	Total		Average	
		Incentive Services	Paid for Incentives	Incentive Services	Paid for Incentives
Year	113,09		48,775,35		
200708	7	186,131	0	1.6	431.27
200809	109,56	138,334	40,338,21	1.3	368.17
	3		0		

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

3.2 Unadjusted Cost Comparisons

Table 6 presents the patient counts for those who did, and did not receive incentive based care by age, gender, RUB, and attachment level. Table 7 presents the unadjusted costs for people who did and did not, receive incentive based care. It should be noted that the data set we analyzed included patients who were on the seven registries plus patients for whom a complex care incentive was billed but who were not on two of the relevant registries. As shall be shown later, the costs for people for whom incentives were billed, but who were not on registries, were lower than for people for whom incentives were billed and were on the registries.

Table 6: Number of Complex Care Patients: Fiscal 2008/09

Averages	Complex Care Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	123,727	71,924	31,976	19,827	100,974	46,707	32,339	21,928
Client Age Group								
0 - 44	9,489	5,961	2,571	957	1,540	834	483	223
45 - 59	29,804	18,702	7,153	3,949	11,559	6,303	3,299	1,957
60 - 69	30,603	18,599	7,662	4,342	22,031	11,622	6,582	3,827
70 - 79	29,321	16,481	7,688	5,152	33,116	15,408	10,627	7,081
80 and over	24,510	12,181	6,902	5,427	32,728	12,540	11,348	8,840
Gender								
Females	57,246	34,105	14,669	8,472	47,431	22,264	15,401	9,766
Males	66,481	37,819	17,307	11,355	53,543	24,443	16,938	12,162
Attachment to Practice								
1. Less than 40%	5,076	1,793	1,540	1,743	1,757	324	524	909
2. 40% - 59%	19,425	9,224	5,464	4,737	9,896	3,046	3,184	3,666
3. 60% - 79%	28,029	14,496	7,927	5,606	18,918	6,780	6,439	5,699
4. 80% - 89%	23,341	13,846	6,073	3,422	18,664	8,165	6,174	4,325
5. 90% or More	47,856	32,565	10,972	4,319	51,739	28,392	16,018	7,329
Disease Combinations								
Asthma and COPD Combos	9,010	5,831	2,163	1,016	3,159	1,746	969	444
CHF Plus	35,627	17,448	10,172	8,007	26,168	9,834	8,744	7,590
CVD and IH Combos	39,038	23,317	10,398	5,323	10,851	3,959	4,021	2,871
Diabetes Plus	36,014	23,131	8,074	4,809	42,902	24,161	12,072	6,669
Other	4,038	2,197	1,169	672	17,894	7,007	6,533	4,354

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 7: Average Annual Costs for Complex Care Patients: Fiscal 2008/09

Averages	Complex Care Incentive							
	No				Yes			
	Total Costs				Total Costs			
		Resource Utilization Band				Resource Utilization Band		
	All	3	4	5	All	3	4	5
All	6,728	2,827	7,261	20,020	6,745	3,307	6,054	15,086
Client Age Group								
0 - 44	5,465	2,239	7,185	20,936	6,680	2,686	6,766	21,431
45 - 59	5,686	2,448	6,889	18,843	6,049	2,820	6,219	16,164
60 - 69	6,230	2,664	7,005	20,133	6,329	3,049	6,050	16,770
70 - 79	7,500	3,265	7,573	20,938	6,937	3,565	6,139	15,475
80 and over	8,185	3,355	7,613	19,754	7,078	3,515	5,899	13,646
Gender								
Females	6,658	2,976	7,434	20,139	6,768	3,478	6,291	15,018
Males	6,789	2,693	7,115	19,931	6,724	3,151	5,838	15,141
Attachment to Practice								
1. Less than 40%	15,134	4,055	11,341	29,881	21,443	6,090	12,900	31,841
2. 40% - 59%	10,136	3,369	9,221	24,368	12,284	4,214	8,875	21,951
3. 60% - 79%	8,007	3,112	7,918	20,794	9,122	3,825	7,396	17,375
4. 80% - 89%	5,898	2,716	6,918	16,965	6,552	3,418	6,161	13,025
5. 90% or More	4,109	2,527	5,428	12,689	4,386	3,022	4,689	9,010
Disease Combinations								
Asthma and COPD Combos	4,559	2,169	5,523	16,220	5,081	2,820	5,905	12,172
CHF Plus	9,373	3,496	8,412	23,399	10,165	4,521	8,041	19,926
CVD and IH Combos	5,570	2,538	6,744	16,561	6,505	3,164	5,545	12,458
Diabetes Plus	5,980	2,791	7,122	19,401	5,650	3,102	5,805	14,599
Other	6,109	2,717	6,027	17,340	4,806	2,511	4,189	9,424

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

3.3 Adjusted Cost Comparisons

3.3.1 Adjusted Cost Comparisons for Patients on the Registries Plus Patients for Whom an Incentive was Billed

We compared the results related to costs adjusting for the impact of a number of key variables. Age standardization is commonly used in epidemiological analyses when one wants to age standardize two different things, such as disease rates across the general population. However, the principle which underlies the concept of standardization is that one adjusts variables which may have an impact on the results of interest against the population of relevance. We adjusted by age, gender, RUB level and attachment level.

Tables 8 to 12 present data on the comparative costs for complex care when one considers patients on the seven registries plus patients who received incentive based care (some patients received incentive based care but were not on the corresponding registries.) When this group of patients is analyzed those who received incentive based care cost less on an unadjusted (see Table 4), and adjusted basis.

Table 8 presents the number of patients broken down by the variables of gender, age, and RUB. Table 9 presents the detailed comparative costs by each of the variables used for adjustment. Table 10 presents age and sex adjusted cost data by RUB and whether or not the patient received incentive based care. Table 11 presents the comparative costs for those who did, and did not receive incentive based care, adjusted for differences in gender, age and RUB levels between the two groups. It should be noted that while those who received incentive based care cost less, they also had higher levels of attachment (which are correlated with lower costs). Thus, Table 12 presents comparative data adjusted for gender, age, RUB and attachment level which shows that, even after all of the adjustments are made, patients who received incentive based care cost less.

Table 8: Number of Patients by RUB, Gender, and Age Group for Complex Care Patients: Fiscal 2008/09

		No of Patients				All	% of Patients
		Resource Utilization Band					
		3	4	5			
Gender	Client Age Group						
Females	0 - 44	3,719	1,872	603	6,194	2.8	
	45 - 59	11,806	4,705	2,409	18,920	8.4	
	60 - 69	12,749	5,897	3,103	21,749	9.7	
	70 - 79	14,215	7,843	4,949	27,007	12.0	
	80 and over	13,880	9,753	7,174	30,807	13.7	
Males	0 - 44	3,076	1,182	577	4,835	2.2	
	45 - 59	13,199	5,747	3,497	22,443	10.0	
	60 - 69	17,472	8,347	5,066	30,885	13.7	
	70 - 79	17,674	10,472	7,284	35,430	15.8	
	80 and over	10,841	8,497	7,093	26,431	11.8	
Gender							
Females		56,369	30,070	18,238	104,677	46.6	
Males		62,262	34,245	23,517	120,024	53.4	
Client Age Group							
0 - 44		6,795	3,054	1,180	11,029	4.9	
45 - 59		25,005	10,452	5,906	41,363	18.4	
60 - 69		30,221	14,244	8,169	52,634	23.4	
70 - 79		31,889	18,315	12,233	62,437	27.8	
80 and over		24,721	18,250	14,267	57,238	25.5	
All		118,631	64,315	41,755	224,701	100.0	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 9: Average Annual Costs by RUB, Gender, and Age Group for Complex Care Patients: Fiscal 2008/09

		Total Cost					
		Resource Utilization Band					
		3		4		5	
		Complex Care Incentive		Complex Care Incentive		Complex Care Incentive	
		No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
Gender	Client Age Group						
Females	0 - 44	2,263	2,617	7,189	7,698	20,218	22,910
	45 - 59	2,512	2,947	6,578	6,479	18,518	16,365
	60 - 69	2,840	3,251	7,169	6,205	19,769	16,082
	70 - 79	3,428	3,668	7,902	6,251	21,232	15,303
	80 and over	3,628	3,699	8,125	6,254	20,483	14,041
Males	0 - 44	2,207	2,746	7,178	5,565	21,709	20,067
	45 - 59	2,387	2,721	7,145	6,009	19,065	16,022
	60 - 69	2,536	2,901	6,895	5,934	20,351	17,202
	70 - 79	3,141	3,476	7,348	6,048	20,746	15,595
	80 and over	3,013	3,274	7,041	5,485	19,020	13,246

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 10: Average Annual Costs for Complex Care Patients Adjusted for Gender and Age Group, Within RUB: Fiscal 2008/09

	Resource Utilization Band					
	3		4		5	
	Complex Care Incentive		Complex Care Incentive		Complex Care Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	423	824	670	1,015	1,128	1,405
Specialist Amount	338	293	833	659	2,071	1,586
Diag Fac Amount	406	416	698	638	977	924
GP Specialist and Diag Fac Amounts	1,167	1,533	2,202	2,312	4,176	3,915
Hospital Costs	801	542	3,801	2,272	14,106	9,560
Pharmacy Costs	934	1,140	1,333	1,512	1,799	1,899
Total Cost	2,901	3,215	7,336	6,096	20,081	15,373
Attachment to Practice	83	88	78	84	71	77

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 11: Average Annual Costs for Complex Care Patients Adjusted for RUB, Gender, and Age Group: Fiscal 2008/09

	Complex Care Incentive	
	No Incentive	Incentive
GP Amount	625	987
Specialist Amount	802	638
Diag Fac Amount	596	574
GP Specialist and Diag Fac Amounts	2,022	2,199
Hospital Costs	4,132	2,713
Pharmacy Costs	1,209	1,388
Total Cost	7,363	6,299
Attachment to Practice	79	85

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 12: Average Annual Costs for Complex Care Patients Adjusted for RUB, Attachment Level, Gender, and Age Group: Fiscal 2008/09

	Complex Care Incentive	
	No Incentive	Incentive
GP Amount	612	1,001
Specialist Amount	780	660
Diag Fac Amount	594	579
GP Specialist and Diag Fac Amounts	1,986	2,240
Hospital Costs	3,910	2,909
Pharmacy Costs	1,210	1,389
Average Total Cost	7,106	6,538

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

3.3.2 Adjusted Cost Comparisons for Patients on The Registries Only

Tables 13 to 17 present data on the comparative costs for complex care when one only considers patients who were on the registries. When this group of patients is considered, those receiving incentive based care cost more.

Table 13 presents the number of patients broken down by the variable of gender, age and RUB. Table 14 presents the detailed comparative costs by each of the variables used for adjustment. Table 15 presents age and sex adjusted cost data by RUB and whether or not the patient received incentive based care. Table 16 presents the comparative costs for those who did, and did not receive incentive based care, adjusted for differences in gender, age and RUB levels between the two groups. It should be noted that while the costs for patients who did, and did not, receive incentive based care were similar, those who did receive incentive based care had a higher average attachment level. Thus, one would expect that if one adjusts for attachment level, their costs would increase (i.e., their attachment level would be decreased to be comparable to the level of patients who did not receive incentive based care. Lowering the attachment level would increase the cost). Table 17 presents comparative data adjusted for gender, age, RUB and attachment level. As can be seen, the adjusted costs are higher for patients who received incentive based care.

3.3.3 Discussion

In comparing Tables 12 and 17, one can note a number of points. The adjusted cost differential for GP services, for complex care, is considerably higher than for most other conditions. While GP costs were some \$400 higher for complex care patients who received incentives, they were \$169 higher for diabetes, \$25 higher for CHF and \$44 higher for hypertension. In addition, on average, drug costs for CDM patients were reasonably similar between those who did and did not receive incentive based care. For complex care patients, drugs costs were considerably higher for those who received incentive based care. These factors

would account for most of the differences in costs seen for complex care patients. When one considers people on registries plus people who received incentive based care and were not on registries, hospital costs were considerably higher for those who received incentive based care. The lower hospital costs more than offset higher GP and drug costs due to the use of incentives. For the registries only group, there was a much narrower differential in hospital costs between the two groups. The differential was not enough to compensate for increased GP costs and drug costs for people who received incentives based care.

Table 13: Number of Patients by RUB, Gender, and Age Group for Complex Care Patients on Registries: Fiscal 2008/09

		No of Patients				% of Patients
		Resource Utilization Band			All	
		3	4	5		
Gender	Client Age Group					
Females	0 - 44	3,553	1,751	567	5,871	3.2
	45 - 59	10,625	4,172	2,150	16,947	9.2
	60 - 69	10,180	4,631	2,594	17,405	9.5
	70 - 79	10,356	5,552	3,793	19,701	10.7
	80 and over	10,564	6,999	5,340	22,903	12.4
Males	0 - 44	2,865	1,111	541	4,517	2.5
	45 - 59	11,863	5,168	3,185	20,216	11.0
	60 - 69	14,762	7,136	4,438	26,336	14.3
	70 - 79	14,378	8,428	6,103	28,909	15.7
	80 and over	8,878	6,655	5,692	21,225	11.5
Gender						
Females		45,278	23,105	14,444	82,827	45.0
Males		52,746	28,498	19,959	101,203	55.0
Client Age Group						
0 - 44		6,418	2,862	1,108	10,388	5.6
45 - 59		22,488	9,340	5,335	37,163	20.2
60 - 69		24,942	11,767	7,032	43,741	23.8
70 - 79		24,734	13,980	9,896	48,610	26.4
80 and over		19,442	13,654	11,032	44,128	24.0
All		98,024	51,603	34,403	184,030	100.0

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 14: Average Annual Costs by RUB, Gender, and Age Group for Complex Care Patients on Registries: Fiscal 2008/09

		Total Cost					
		Resource Utilization Band					
		3		4		5	
		Complex Care Incentive		Complex Care Incentive		Complex Care Incentive	
Gender	Client Age Group	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
Females	0 - 44	2,263	2,869	7,189	9,256	20,218	25,521
	45 - 59	2,512	3,424	6,578	7,536	18,518	18,437
	60 - 69	2,840	3,993	7,169	7,412	19,769	19,435
	70 - 79	3,428	4,449	7,902	7,705	21,232	18,821
	80 and over	3,628	4,370	8,125	7,756	20,483	17,074
Males	0 - 44	2,207	3,208	7,178	6,823	21,709	24,323
	45 - 59	2,387	3,127	7,145	7,108	19,065	17,773
	60 - 69	2,536	3,361	6,895	6,825	20,351	19,183
	70 - 79	3,141	3,968	7,348	6,923	20,746	18,072
	80 and over	3,013	3,709	7,041	6,269	19,020	15,388

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 15: Average Annual Costs for Complex Care Patients on Registries Adjusted for Gender and Age Group, Within RUB: Fiscal 2008/09

	Resource Utilization Band					
	3		4		5	
	Complex Care Incentive		Complex Care Incentive		Complex Care Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	420	847	665	1,065	1,122	1,496
Specialist Amount	338	338	837	754	2,087	1,843
Diag Fac Amount	403	468	699	726	984	1,044
GP Specialist and Diag Fac Amounts	1,161	1,653	2,202	2,545	4,193	4,383
Hospital Costs	792	700	3,780	2,871	14,057	11,434
Pharmacy Costs	918	1,373	1,321	1,795	1,810	2,201
Total Cost	2,871	3,727	7,303	7,211	20,060	18,018
Attachment to Practice	82	87	77	83	71	75

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 16: Average Annual Costs for Complex Care Patients on Registries: Adjusted for RUB, Gender, and Age Group: Fiscal 2008/09

	Complex Care Incentive	
	No Incentive	Incentive
GP Amount	620	1,029
Specialist Amount	805	736
Diag Fac Amount	595	648
GP Specialist and Diag Fac Amounts	2,020	2,414
Hospital Costs	4,110	3,316
Pharmacy Costs	1,198	1,646
Total Cost	7,327	7,376
Attachment to Practice	79	84

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 17: Average Annual Costs for Complex Care Patients on Registries: Adjusted for RUB, Attachment, Gender, and Age Group: Fiscal 2008/09

	Complex Care Incentive	
	No Incentive	Incentive
GP Amount	612	1,046
Specialist Amount	791	763
Diag Fac Amount	594	652
GP Specialist and Diag Fac Amounts	1,997	2,462
Hospital Costs	3,971	3,547
Pharmacy Costs	1,199	1,644
Average Total Cost	7,167	7,652

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

3.4 Combinations of Complex Care Conditions

Patients can have different combinations of diseases and there can be considerable variability in costs depending on the disease combinations that complex care patients have. Tables 18 to 21 provide data on this. Table 18 is for all patients (i.e., RUBs 3 to 5). The first column is for patients who received incentive based care. They received the complex care incentive, the diabetes incentive and the CHF incentive. The second and third columns refer to patients who received the complex care incentive and the CHF and diabetes incentives, respectively. The fourth column presents data for patients who only had the complex care incentive. Columns 1 to 4 are for patients who received the complex care incentives. Columns 5 to 8 are for people who would qualify as complex care (i.e., they would be on two of the seven registries) but would not have had the complex care incentive billed for them. Column 5 is for complex care eligible people who did not have a complex care incentive but did have both a CHF and diabetes incentive. Columns 6 and 7 refer to patients who only had the CHF or diabetes incentives. Column 8 refers to patients who were complex care eligible but for whom no incentives of any kind were billed. It is interesting to note, in Tables 17 and 18, that for higher care needs patients (i.e., RUBs 4 and 5), the costs for patients who had no incentives were higher than for those who only had the complex care incentive (i.e., neither group had separate CHF and diabetes incentives). Tables 22 to 25 present data on selected combinations of patients. Each patient can only be in one group so patients are removed at each step of the selection process. For example, combinations with Diabetes would not include CHF patients as they would have been removed in the first step of selecting patients with CHF. The selection process was as follows:

- Combinations with CHF.
- Combinations with Diabetes.
- Combinations with CVD, and IH.
- Combinations with Asthma and COPD.
- Other Combinations.

As can be seen in Tables 22 to 25, the highest cost patients were those who had CHF plus one or more of the other seven conditions. The next highest cost combination was for those who had diabetes plus one of more of the other seven conditions. These findings again confirm that CHF patients have high costs. However, the uptake for the CHF incentive has been much lower than for diabetes or hypertension. This again points out that the CHF incentive may need to be reviewed so that a higher percentage of CHF patients can receive incentive based care.

Table 18: Average Annual Costs by Incentive Groups (RUBs 3 to 5): Fiscal 2008/09

Averages for Costs		Incentives Received							
		1. Complex Care Plus Diabetes and CHF	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Only	5. Diabetes and CHF	6. CHF	7. Diabetes	8. None
Patients		3,438	7,292	38,130	52,114	914	3,912	19,391	99,510
Age		74.8	78.4	70.2	74.2	75.1	75.8	64.5	65.7
GP Amount		1,341	1,217	1,012	970	946	789	651	569
Specialist Amount		890	772	634	669	952	723	695	762
Diag Fac Amount		801	717	567	583	758	658	552	572
GP Specialist and Diag Fac Amounts		3,032	2,705	2,212	2,222	2,656	2,170	1,898	1,903
Hospital Costs		4,888	4,627	2,454	3,133	6,004	4,664	2,834	3,743
Pharmacare Cost		2,287	1,406	1,595	1,235	2,187	1,232	1,537	1,082
Total Costs		10,207	8,739	6,262	6,590	10,846	8,066	6,269	6,728

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 19: Average Annual Costs by Incentive Groups (RUB 3): Fiscal 2008/09

Averages for Costs		Incentives Received							
		1. Complex Care Plus Diabetes and CHF	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Only	5. Diabetes and CHF	6. CHF	7. Diabetes	8. None
Patients		1,468	2,818	21,216	21,205	408	1,905	12,610	57,001
Age		74.3	77.9	69.4	72.6	74.0	74.9	63.4	64.7
GP Amount		1,068	946	856	774	645	536	495	394
Specialist Amount		397	342	293	282	375	303	326	339
Diag Fac Amount		601	540	411	411	515	509	400	394
GP Specialist and Diag Fac Amounts		2,066	1,828	1,559	1,467	1,535	1,348	1,221	1,127
Hospital Costs		1,081	1,176	448	569	877	958	557	815
Pharmacare Cost		2,008	1,205	1,302	1,019	1,658	974	1,217	824
Total Costs		5,154	4,209	3,310	3,056	4,070	3,280	2,996	2,766

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 20: Average Annual Costs by Incentive Groups (RUB 4): Fiscal 2008/09

Averages for Costs		Incentives Received							
		1. Complex Care Plus Diabetes and CHF	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Only	5. Diabetes and CHF	6. CHF	7. Diabetes	8. None
Patients		1,100	2,452	10,664	18,123	264	1,186	4,116	26,410
Age		75.1	78.4	70.8	74.7	76.0	75.0	65.5	66.0
GP Amount		1,326	1,181	1,058	953	894	801	763	635
Specialist Amount		763	693	677	595	756	739	866	849
Diag Fac Amount		825	722	642	599	825	703	720	697
GP Specialist and Diag Fac Amounts		2,914	2,596	2,377	2,147	2,475	2,244	2,348	2,181
Hospital Costs		3,326	3,430	2,107	2,172	4,066	4,018	3,196	3,799
Pharmacare Cost		2,370	1,380	1,768	1,280	2,334	1,296	1,895	1,224
Total Costs		8,610	7,406	6,252	5,599	8,875	7,557	7,439	7,204

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 21: Average Annual Costs by Incentive Groups (RUB 5): Fiscal 2008/09

Averages for Costs		Incentives Received							
		1. Complex Care Plus Diabetes and CHF	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Only	5. Diabetes and CHF	6. CHF	7. Diabetes	8. None
Patients		870	2,022	6,250	12,786	242	821	2,665	16,099
Age		75.3	79.1	71.8	76.2	75.9	78.8	68.4	68.9
GP Amount		1,821	1,637	1,462	1,318	1,510	1,361	1,213	1,081
Specialist Amount		1,881	1,467	1,718	1,416	2,137	1,675	2,175	2,116
Diag Fac Amount		1,109	956	967	847	1,094	935	1,014	994
GP Specialist and Diag Fac Amounts		4,811	4,061	4,148	3,581	4,741	3,971	4,402	4,191
Hospital Costs		13,286	10,887	9,855	8,746	16,763	14,195	13,043	14,019
Pharmacare Cost		2,653	1,720	2,298	1,529	2,918	1,740	2,501	1,761
Total Costs		20,750	16,668	16,301	13,856	24,422	19,907	19,947	19,972

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 22: Average Annual Costs by Disease Combinations (RUBs 3 to 5): Fiscal 2008/09

Averages for Costs	Disease Combination				
	Asthma and COPD Combos	CHF Plus	CVD and IH Combos	Diabetes Plus	Other
Patients	12,169	61,795	49,889	78,916	21,932
Age	53.4	75.0	68.5	66.2	72.9
GP Amount	674	925	587	792	852
Specialist Amount	488	911	706	647	557
Diag Fac Amount	376	702	586	540	505
GP Specialist and Diag Fac Amounts	1,537	2,538	1,879	1,978	1,913
Hospital Costs	1,869	5,578	3,086	2,407	2,151
Pharmacare Cost	1,288	1,592	809	1,415	982
Total Costs	4,694	9,709	5,774	5,800	5,046

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 23: Average Annual Costs by Disease Combinations (RUB 3): Fiscal 2008/09

Averages for Costs	Disease Combination				
	Asthma and COPD Combos	CHF Plus	CVD and IH Combos	Diabetes Plus	Other
Patients	7,577	27,282	27,276	47,292	9,204
Age	52.1	74.1	67.7	65.2	70.6
GP Amount	498	627	425	637	673
Specialist Amount	252	356	337	309	269
Diag Fac Amount	263	494	408	391	373
GP Specialist and Diag Fac Amounts	1,014	1,478	1,170	1,337	1,315
Hospital Costs	475	1,083	793	488	468
Pharmacare Cost	830	1,305	666	1,125	778
Total Costs	2,319	3,866	2,629	2,950	2,560

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 24: Average Annual Costs by Disease Combinations (RUB 4): Fiscal 2008/09

Averages for Costs		Disease Combination				
		Asthma and COPD Combos	CHF Plus	CVD and IH Combos	Diabetes Plus	Other
Patients		3,132	18,916	14,419	20,146	7,702
Age		54.7	75.1	68.8	67.2	73.5
GP Amount		815	927	656	884	863
Specialist Amount		633	794	781	754	542
Diag Fac Amount		489	739	698	653	530
GP Specialist and Diag Fac Amounts		1,937	2,460	2,135	2,290	1,934
Hospital Costs		2,108	4,134	3,378	2,383	1,521
Pharmacare Cost		1,597	1,647	897	1,660	1,013
Total Costs		5,642	8,241	6,410	6,333	4,468

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 25: Average Annual Costs by Disease Combinations (RUB 5): Fiscal 2008/09

Averages for Costs		Disease Combination				
		Asthma and COPD Combos	CHF Plus	CVD and IH Combos	Diabetes Plus	Other
Patients		1,460	15,597	8,194	11,478	5,026
Age		57.5	76.3	70.4	68.8	76.1
GP Amount		1,279	1,445	1,002	1,267	1,163
Specialist Amount		1,402	2,023	1,806	1,851	1,106
Diag Fac Amount		718	1,020	981	955	709
GP Specialist and Diag Fac Amounts		3,399	4,489	3,788	4,072	2,978
Hospital Costs		8,587	15,191	10,206	10,361	6,196
Pharmacare Cost		3,002	2,029	1,130	2,177	1,308
Total Costs		14,989	21,709	15,124	16,611	10,482

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

3.5 Additional Analyses

The GPSC has an interest in seeing if incentive payments have a preventive effect in that they reduce the proportion of people moving to higher care needs over time. In this section we present data on this topic. Data are presented, starting at two points, fiscal 06/07 and fiscal 07/08. The complex care incentive started in fiscal 07/08. Thus, fiscal 06/07 is a pre-incentive base year. For the fiscal 06/07 data the people who are shown as receiving incentives were those who had an incentive in fiscal 07/08.

What we see is a mixed picture and it will take additional years of data and analyses, to tease out a pattern, if there is one. However, the data presented here provide a good start. Table 26 presents data, starting in fiscal 06/07 on the percentage of patients who moved to a higher or lower RUB (we have included RUB 2 into our analyses to account for people at RUB 3 who moved to a lower RUB, overall there were relatively few patients at RUB 2). Table 27 presents the same data using fiscal 07/08, the first year in which people could receive incentives based care, as the base year. Table 26 indicates that, overall, 37.4% of patients who received incentive based care moved to a higher RUB. This was the case for 25.6% of patients who did not receive incentive based care. The incentive group also had a higher proportion of patients who moved to a lower RUB. In contrast, Table 27 shows that only 22.7% of patients, starting in fiscal 07/08, who received incentive based care, moved to a higher RUB, compared to 26.6% of patients who did not receive incentive based care. It may be that people whose health was deteriorating were the first to receive incentive based care. If so, one hypothesis would be that because they were deteriorating in fiscal 06/07 they were more likely to move into a higher RUB in fiscal 07/08 and to receive an incentive, resulting in the data which show that higher proportions of people who received incentive based care progressed to a higher RUB. Tables 28 and 29 show a more detailed breakdown of the same data.

We also conducted cost analyses. These analyses seem to indicate that for people who did not receive incentive based care, their costs increased more if they went to a higher rub, and decreased more if they went to a lower RUB. Tables 30 and 31 show the differences in costs. For example, Table 30 shows that people who started at RUB 3 and ended at RUB 5, and did not receive incentive based care, cost \$16,665 more at RUB 5 in fiscal 08/09 than they did at RUB 3 in fiscal 06/07. The comparable cost differential for patients who received incentive based care was \$11,317. For patients who started at RUB 4, the cost decrease was \$3,522 for people ended at RUB 3, and did not receive incentive based care, compared to a decrease of \$3,263 for patients who received incentive based care. The comparable figures were decreases of \$5,566 and \$2,258 for patients who moved from RUB 4 in fiscal 06/07 to RUB 2 in fiscal 08/09. However, those were relatively few patients. Similar, but more modest, cost differentials can also be seen in Table 31 with fiscal 07/08 as the base year.

Table 26: Changes in RUB from 2006/07 to 2008/09 for Complex Care Patients

	Change in RUB					
	Higher RUB		Lower RUB		Same RUB	
	Number of Patients	% of Patients	Number of Patients	% of Patients	Number of Patients	% of Patients
Complex Care Incentive						
No	52,394	25.6	48,570	23.7	103,592	50.6
Yes	63,340	37.4	27,462	16.2	78,464	46.4
All	115,734	31.0	76,032	20.3	182,056	48.7

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 27: Changes in RUB from 2007/08 to 2008/09 for Complex Care Patients Using Incentives from 2007/08

	Change in RUB					
	Higher RUB		Lower RUB		Same RUB	
	Number of Patients	% of Patients	Number of Patients	% of Patients	Number of Patients	% of Patients
Complex Care Incentive						
No	63,766	26.6	51,468	21.4	124,776	52.0
Yes	36,538	22.7	41,636	25.9	82,770	51.4
All	100,304	25.0	93,104	23.2	207,546	51.8

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 28: Changes in RUB from 2006/07 to 2008/09 for Complex Care Patients

		Change in RUB					
		Higher RUB		Lower RUB		Same RUB	
		Number of Patients	% of Patients	Number of Patients	% of Patients	Number of Patients	% of Patients
Rub Base Year	Complex Care Incentive						
3	No	42,884	33.8	4,514	3.6	79,648	62.7
	Yes	52,096	48.4	304	0.3	55,330	51.4
	All	94,980	40.5	4,818	2.1	134,978	57.5
4	Complex Care Incentive						
	No	9,510	18.5	25,656	50.0	16,184	31.5
	Yes	11,244	28.4	13,638	34.4	14,762	37.2
	All	20,754	22.8	39,294	43.2	30,946	34.0
5	Complex Care Incentive						
	No	.	.	18,400	70.3	7,760	29.7
	Yes	.	.	13,520	61.8	8,372	38.2
	All	.	.	31,920	66.4	16,132	33.6

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 29: Changes in RUB from 2007/08 to 2008/09 for Complex Care Patients Using Incentives from 2007/08

		Change in RUB					
		Higher RUB		Lower RUB		Same RUB	
		Number of Patients	% of Patients	Number of Patients	% of Patients	Number of Patients	% of Patients
Rub Base Year	Complex Care Incentive						
3	No	51,260	34.5	4,316	2.9	93,048	62.6
	Yes	24,496	33.8	706	1.0	47,346	65.3
	All	75,756	34.3	5,022	2.3	140,394	63.5
4	Complex Care Incentive						
	No	12,506	21.0	26,614	44.7	20,364	34.2
	Yes	12,042	22.7	20,142	38.0	20,806	39.3
	All	24,548	21.8	46,756	41.6	41,170	36.6
5	Complex Care Incentive						
	No	.	.	20,538	64.4	11,364	35.6
	Yes	.	.	20,788	58.7	14,618	41.3
	All	.	.	41,326	61.4	25,982	38.6

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 30: Net Cost Changes by RUB from 2006/07 to 2008/09 for Complex Care Patients

200809

Change in Total Cost			Rub Final Year							
			2		3		4		5	
			Complex Care Incentive		Complex Care Incentive		Complex Care Incentive		Complex Care Incentive	
			No	Yes	No	Yes	No	Yes	No	Yes
Change in Costs	Rub Base Year									
	3	-839	7	165	471	3,974	2,638	16,665	11,317	
	4	-5,566	-2,258	-3,522	-3,263	-168	-529	10,710	6,973	
	5	-18,842	-8,422	-14,404	-14,088	-9,314	-9,556	1,031	-445	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.

Table 31: Net Cost Changes by RUB from 2007/08 to 2008/09 for Complex care Patients Using Incentives from 2007/08

200809

Change in Total Cost			Rub Final Year							
			2		3		4		5	
			Complex Care Incentive		Complex Care Incentive		Complex Care Incentive		Complex Care Incentive	
			No	Yes	No	Yes	No	Yes	No	Yes
Change in Costs	Rub Base Year									
	3		-734	-969	176	-267	3,608	2,394	14,613	13,487
	4		-4,842	-3,906	-3,301	-2,560	-106	-52	9,040	8,051
	5		-13,059	-13,083	-13,568	-11,415	-9,768	-7,679	-297	147

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/09.