

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 2009/10**

Prepared by

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

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

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

HIGHLIGHTS OF FINDINGS

- For Complex Care, there were 64,535 patients who received incentive based care and 137,604 who did not.
- Costs increased consistently by age. For the incentive group, costs were lower for males than females (\$8,211 vs. \$8,706) but were higher for males than for females in the non-incentive group (\$6,633 vs. \$6,447).
- Costs were inversely related to attachment to practice for those who received incentive based care and those who did not.
- Costs clearly increased on a consistent basis, with the number of registries a patient was on.
- While age and sex adjusted costs were lower for patients in RUBs 4 and 5 who received incentive based care, they were much higher in RUB 3 (\$3,685 vs. \$2,842).
- Overall, adjusting for age, sex and RUB, patients who received incentive based care cost \$7,365, compared to \$7,182 for those who did not. When attachment level was added to the adjustment, the corresponding numbers were \$7,644 vs. \$7,026.
- When one adjusts for age, sex, RUB, attachment level, and the number of registries, patients who received incentive based care cost \$7,421 compared to \$7,124 for those who did not.
- For Complex Care patients, total cost avoidance is as follows when one adjusts for age, sex, RUB, attachment level and number of registries, and when one adjusts for age, sex and RUB.

	Costs Adjusted for Age, Sex, RUB, Attachment Level and Number of Registries	Costs Adjusted for Age, Sex, and RUB
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	\$4,406,104	\$11,745,370
Total Cost for Incentives	\$41,735,585	\$41,735,585
Total Dollar Savings/Cost	-\$37,329,481	-\$29,990,215

- For the Complex Care incentive, patients can have combinations of conditions. Overall, for RUBs 3 to 5 combined, the highest cost combination at an average annual cost of \$14,241 was for patients who had a complex care incentive plus incentives for diabetes, chf and COPD, and the next highest cost was for patients with the complex care and chf incentives (\$9,838). The lowest cost was for patients who only had the complex care incentive (\$8,260).

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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 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 2009/10.

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.
- vii. Exclude people not on registries

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. It shows the distribution of all patients compared to patients selected for analysis.

¹ The main conditions are adjusted from time to time. Recently, more than seven main conditions are included (see Appendix A).

Table 1: Patients with Complex Care April 2009 to March 2010 by Services

	Number of Patients	Number of Patients					
		Resource Utilization Band					
		0	1	2	3	4	5
All	267,460	1,424	1,560	14,157	137,944	63,768	48,607
GP Services							
0	207	8	55	25	98	12	9
01	5,464	130	770	2,173	2,049	227	115
02	7,402	138	343	2,244	4,170	359	148
03	9,800	123	175	2,219	6,369	708	206
04	12,145	109	83	1,912	8,591	1,179	271
05	14,233	111	52	1,663	10,295	1,709	403
06	15,022	97	29	1,211	11,009	2,145	531
07	15,422	70	12	805	11,192	2,615	728
08	15,032	61	16	600	10,589	2,946	820
09	14,379	76	5	357	9,713	3,184	1,044
10 or more	158,354	501	20	948	63,869	48,684	44,332

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

There were a number of changes in regard to the complex care incentive for fiscal 09/10. These changes are documented in Appendix A.

3. FINDINGS

3.1 Unadjusted Cost Comparisons

Table 2 presents the patient counts for those who did, and did not receive incentive based care by age, gender, RUB, and attachment level. Table 3 presents the unadjusted costs for people who did and did not, receive incentive based care.

3.2 Adjusted Cost Comparisons

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, attachment level and the number of registries the patient is on.

Table 2: Number of Complex Care Patients: Fiscal 2009/010

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	137,604	82,479	34,559	20,566	64,535	28,253	20,754	15,528
Client Age Group								
0 - 44	8,710	5,568	2,294	848	994	536	289	169
45 - 59	35,212	23,103	7,903	4,206	7,949	4,163	2,325	1,461
60 - 69	35,276	22,260	8,382	4,634	14,217	6,950	4,320	2,947
70 - 79	30,774	17,516	8,198	5,060	19,903	8,700	6,465	4,738
80 and over	27,632	14,032	7,782	5,818	21,472	7,904	7,355	6,213
Gender								
Females	66,526	40,904	16,499	9,123	27,989	12,380	9,074	6,535
Males	71,078	41,575	18,060	11,443	36,546	15,873	11,680	8,993
Attachment to Practice								
1. Less than 40%	5,835	2,271	1,718	1,846	1,444	268	393	783
2. 40% - 59%	21,307	10,336	5,957	5,014	7,023	1,856	2,249	2,918
3. 60% - 79%	31,326	16,630	8,805	5,891	12,744	4,259	4,338	4,147
4. 80% - 89%	25,720	15,965	6,442	3,313	12,206	5,049	4,101	3,056
5. 90% or More	53,416	37,277	11,637	4,502	31,118	16,821	9,673	4,624
Disease Combinations								
Asthma and COPD Only	7,778	4,814	1,995	969	877	435	290	152
CHF Plus	35,586	17,010	10,369	8,207	26,050	9,721	8,547	7,782
CVD and IH Combos	43,029	26,410	11,117	5,502	10,716	4,086	3,928	2,702
Diabetes Plus	47,190	32,105	9,933	5,152	25,806	13,598	7,595	4,613
Other Combos	4,021	2,140	1,145	736	1,086	413	394	279
No of Registries								
2	84,792	55,204	19,896	9,692	22,141	10,726	6,868	4,547
3	35,513	19,797	9,589	6,127	23,345	10,428	7,724	5,193
4	12,948	6,007	3,780	3,161	13,229	5,230	4,385	3,614
5 or More	4,351	1,471	1,294	1,586	5,820	1,869	1,777	2,174

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 3: Average Annual Costs for Complex Care Patients: Fiscal 2009/10

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	6,543	2,793	7,415	20,113	8,426	3,801	7,266	18,389
Client Age Group								
0 - 44	5,918	2,281	7,959	24,271	8,506	3,307	9,255	23,712
45 - 59	5,393	2,332	7,007	19,175	7,374	3,159	7,079	19,855
60 - 69	6,004	2,623	7,135	20,196	7,946	3,452	7,249	19,567
70 - 79	7,197	3,217	7,500	20,482	8,676	4,152	7,271	18,902
80 and over	8,164	3,496	7,883	19,799	8,896	4,095	7,253	16,950
Gender								
Females	6,447	2,931	7,530	20,251	8,706	4,092	7,735	18,797
Males	6,633	2,658	7,310	20,004	8,211	3,575	6,902	18,093
Attachment to Practice								
1. Less than 40%	14,685	4,095	11,732	30,462	25,178	7,185	16,669	35,608
2. 40% - 59%	10,020	3,400	9,513	24,270	15,463	5,190	10,600	25,746
3. 60% - 79%	7,807	3,087	8,206	20,537	11,033	4,498	8,714	20,169
4. 80% - 89%	5,661	2,691	6,904	17,557	8,018	3,915	7,204	15,889
5. 90% or More	3,949	2,458	5,389	12,566	5,152	3,384	5,486	10,888
Disease Combinations								
Asthma and COPD Only	4,769	2,399	5,544	14,947	5,843	2,964	6,491	12,846
CHF Plus	10,114	3,763	9,142	24,506	10,951	4,620	8,575	21,469
CVD and IH Combos	5,213	2,443	6,604	15,698	6,514	3,098	5,519	13,125
Diabetes Plus	5,291	2,628	6,932	18,721	6,791	3,459	6,756	16,673
Other Combos	7,290	2,779	7,115	20,678	7,642	3,644	6,714	14,870
No of Registries								
2	5,095	2,466	6,608	16,963	6,240	3,215	5,887	13,909
3	7,398	3,175	7,749	20,491	7,648	3,623	6,966	16,743
4	10,404	3,936	9,345	23,963	10,366	4,591	8,563	20,910
5 or More	16,284	5,271	11,714	30,228	15,452	5,952	10,701	27,504

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10

Tables 4 to 9 present data on the comparative costs for complex care when one only considers patients who were on the registries. Tables 4 and 5 present the number of patients broken down by the variable of gender, age and RUB. Table 6 presents the detailed comparative costs by gender, age and RUB and whether or not they received incentive based care. Table 7 presents age and sex adjusted cost data by RUB and whether or not the patient received incentive based care. Table 8 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 9 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.

Complex care is different from incentives for single conditions such as diabetes. In analyzing the data it became clear that the number of registries a patient was on had a significant effect on costs. Thus, we added this as another variable in our standardization. In order to do this we truncated age so that we would have adequate numbers in each cell. When we standardize for gender, age, RUB, attachment level, and the number of registries, the costs differential is significantly reduced (see Table 10). In our view, this five variable adjustment is the most appropriate.

Table 11 presents the overall cost summary including the cost of all incentives, and the cost avoidance due to standardized cost differences between those who did, and did not receive incentive based care. As can be seen in Table 11, the overall cost of incentives was \$41.7 million. The use of incentives resulted in cost avoidance of \$16.2 million. Thus, the cost of incentives was estimated to be \$25.5 million instead of the actual cost of \$41.7 million.

Table 4: Number of Patients by RUB, Gender, and Age Group for Complex Care Patients on Registries: Fiscal 2009/10

		No of Patients				All	% of Patients
		Resource Utilization Band					
		3	4	5			
Gender	Client Age Group						
Females	0 - 44	3,510	1,567	491	5,568	2.8	
	45 - 59	13,341	4,715	2,401	20,457	10.1	
	60 - 69	12,820	5,296	2,998	21,114	10.4	
	70 - 79	11,317	5,999	3,862	21,178	10.5	
	80 and over	12,296	7,996	5,906	26,198	13.0	
Males	0 - 44	2,594	1,016	526	4,136	2.0	
	45 - 59	13,925	5,513	3,266	22,704	11.2	
	60 - 69	16,390	7,406	4,583	28,379	14.0	
	70 - 79	14,899	8,664	5,936	29,499	14.6	
	80 and over	9,640	7,141	6,125	22,906	11.3	
Gender							
Females		53,284	25,573	15,658	94,515	46.8	
Males		57,448	29,740	20,436	107,624	53.2	
Client Age Group							
0 - 44		6,104	2,583	1,017	9,704	4.8	
45 - 59		27,266	10,228	5,667	43,161	21.4	
60 - 69		29,210	12,702	7,581	49,493	24.5	
70 - 79		26,216	14,663	9,798	50,677	25.1	
80 and over		21,936	15,137	12,031	49,104	24.3	
All		110,732	55,313	36,094	202,139	100.0	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 5: Number of Patients by RUB, Gender, and Age Group for Complex Care Patients Who Did, and Did Not, Receive Incentive Based Care: Fiscal 2009/10

	No of Patients		
	Complex Care Incentive		All
	No Incentive	Incentive	
Gender			
Females	66,526	27,989	94,515
Males	71,078	36,546	107,624
Client Age Group			
0 - 44	8,710	994	9,704
45 - 59	35,212	7,949	43,161
60 - 69	35,276	14,217	49,493
70 - 79	30,774	19,903	50,677
80 and over	27,632	21,472	49,104
Resource Utilization Band			
3	82,479	28,253	110,732
4	34,559	20,754	55,313
5	20,566	15,528	36,094
All	137,604	64,535	202,139

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 6: Average Annual Costs by RUB, Gender, and Age Group for Complex Care Patients on Registries: Fiscal 2009/10

		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	2,311	3,407	8,054	10,078	26,208	23,267
	45 - 59	2,390	3,260	6,662	7,276	18,833	18,607
	60 - 69	2,838	3,848	6,855	7,750	19,900	20,223
	70 - 79	3,352	4,427	7,720	7,658	20,480	19,463
	80 and over	3,658	4,371	8,546	7,803	20,354	17,762
Males	0 - 44	2,240	3,199	7,809	8,277	22,466	24,132
	45 - 59	2,274	3,082	7,314	6,933	19,431	20,736
	60 - 69	2,443	3,208	7,351	6,942	20,401	19,176
	70 - 79	3,106	3,974	7,338	7,023	20,483	18,553
	80 and over	3,279	3,774	7,091	6,678	19,217	16,226

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 7: Average Annual Costs for Complex Care Patients on Registries Adjusted for Gender and Age Group, Within RUB: Fiscal 2009/10

	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	445	876	702	1,107	1,157	1,560
Specialist Amount	333	336	839	764	1,996	1,833
Diag Fac Amount	387	465	685	715	984	1,044
GP Specialist and Diag Fac Amounts	1,165	1,677	2,226	2,586	4,136	4,438
Hospital Costs	783	689	3,910	3,014	14,187	12,132
Pharmacy Costs	894	1,319	1,311	1,741	1,767	2,121
Total Cost	2,842	3,685	7,446	7,341	20,090	18,691
Attachment to Practice	82	87	77	82	70	75

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 8: Average Annual Costs for Complex Care Patients on Registries: Adjusted for RUB, Gender, and Age Group: Fiscal 2009/10

	Complex Care Incentive	
	No Incentive	Incentive
GP Amount	642	1,061
Specialist Amount	768	721
Diag Fac Amount	575	637
GP Specialist and Diag Fac Amounts	1,986	2,419
Hospital Costs	4,032	3,368
Pharmacy Costs	1,164	1,578
Total Cost	7,182	7,365
Attachment to Practice	79	84

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 9: Average Annual Costs for Complex Care Patients on Registries: Adjusted for RUB, Attachment, Gender, and Age Group: Fiscal 2009/10

	Complex Care Incentive	
	No Incentive	Incentive
GP Amount	634	1,080
Specialist Amount	756	743
Diag Fac Amount	574	639
GP Specialist and Diag Fac Amounts	1,965	2,462
Hospital Costs	3,896	3,606
Pharmacy Costs	1,165	1,575
Average Total Cost	7,026	7,644

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 10: Standardized Rates for Complex Care RUB, Attachment, Number of Registries, and Age/Gender for April 2009 to March 2010

	Complex Care Incentive	
	No Incentive	Incentive
GP Amount	638	1,074
Specialist Amount	764	726
Diag Fac Amount	580	626
GP Specialist and Diag Fac Amounts	1,981	2,426
Hospital Costs	3,948	3,478
Pharmacy Costs	1,195	1,518
Average Total Cost	7,124	7,421

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 11: Summary of Complex Care Incentive Costs: Fiscal 2009/10

	Totals
Number of Patients With Incentives Included Patients	64,535
Total Cost for Incentives	41,735,585
Std Cost Per Patient with Incentives	7,421
Total Cost Per Person With Incentives Excluding Incentive Amount	7,056
Std Cost Per Patient without Incentives	7,124
Savings/Cost Per Person With Incentives Excluding Incentive Amount	68
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	4,406,104
Total Cost for Incentives	41,735,585
Total Dollar Savings/Cost	-37,329,481

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

3.3 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 12 to 15 provide data on this. Table 12 is for all patients (i.e., RUBs 3 to 5). The first column is for patients who received the complex care incentive, the diabetes incentive, the CHF incentive, and the COPD incentive. The second, third and fourth columns refer to patients who received the complex care incentive and the CHF, diabetes and COPD incentives, respectively. The fifth column presents data for patients who only had the complex care incentive. Columns 1 to 5 are for patients who received the complex care incentives. Columns 6 to 9 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 6 is for complex care eligible people who did not have a complex care incentive but did have a CHF incentive. Columns 7 and 8 refer to patients who only had the diabetes or COPD incentives. Column 9 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 14 and 15, 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. Tables 16 to 19 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 16 to 19, 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 the “Other” group. 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 12: Average Annual Costs by Incentive Groups (RUBs 3 to 5): Fiscal 2009/10

Averages for Costs		Incentives Received								
		1. Complex Care Plus Diabetes and CHF and COPD	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Plus COPD	5. Complex Care Only	6. CHF	7. Diabetes	8. COPD	8. None
Patients		905	9,453	24,945	4,095	25,137	5,026	23,899	3,714	104,965
Age		76.2	77.3	69.6	73.1	74.5	75.2	62.7	66.0	66.6
GP Amount		1,661	1,306	1,099	1,266	1,044	847	644	758	586
Specialist Amount		1,016	856	782	748	820	769	622	538	739
Diag Fac Amount		869	752	650	650	678	682	510	484	557
GP Specialist and Diag Fac Amounts		3,546	2,914	2,530	2,664	2,542	2,298	1,776	1,780	1,882
Hospital Costs		7,720	5,369	3,428	4,510	4,334	5,131	2,541	2,992	3,703
Pharmacare Cost		2,975	1,555	1,808	1,742	1,384	1,342	1,383	1,593	1,049
Total Costs		14,241	9,838	7,766	8,916	8,260	8,771	5,701	6,364	6,634

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

Table 13: Average Annual Costs by Incentive Groups (RUB 3): Fiscal 2009/10

Averages for Costs		Incentives Received								
		1. Complex Care Plus Diabetes and CHF and COPD	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Plus COPD	5. Complex Care Only	6. CHF	7. Diabetes	8. COPD	8. None
Patients		322	3,822	12,827	1,642	9,640	2,400	16,539	1,944	61,596
Age		76.2	76.4	68.4	72.4	72.9	74.1	61.3	65.1	65.7
GP Amount		1,277	1,023	902	963	799	584	507	550	414
Specialist Amount		371	353	339	289	331	337	319	243	336
Diag Fac Amount		606	562	456	431	466	514	375	338	382
GP Specialist and Diag Fac Amounts		2,254	1,939	1,698	1,683	1,596	1,435	1,202	1,132	1,132
Hospital Costs		1,404	1,055	588	793	788	1,049	524	669	815
Pharmacare Cost		2,645	1,378	1,482	1,384	1,142	1,070	1,104	1,169	801
Total Costs		6,302	4,372	3,767	3,860	3,527	3,553	2,830	2,969	2,748

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

Table 14: Average Annual Costs by Incentive Groups (RUB 4): Fiscal 2009/10

Averages for Costs		Incentives Received								
		1. Complex Care Plus Diabetes and CHF and COPD	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Plus COPD	5. Complex Care Only	6. CHF	7. Diabetes	8. COPD	8. None
Patients		275	3,057	7,340	1,356	8,726	1,539	4,709	1,156	27,155
Age		76.2	77.6	70.5	73.2	74.9	75.5	64.8	66.4	67.0
GP Amount		1,557	1,272	1,133	1,228	1,008	852	789	811	666
Specialist Amount		787	754	786	632	716	721	865	612	864
Diag Fac Amount		796	757	717	665	679	724	692	558	691
GP Specialist and Diag Fac Amounts		3,140	2,784	2,636	2,526	2,403	2,296	2,346	1,982	2,221
Hospital Costs		4,727	3,948	2,729	3,237	2,890	4,423	3,233	2,650	3,988
Pharmacare Cost		2,937	1,573	1,951	1,817	1,406	1,393	1,806	1,988	1,206
Total Costs		10,804	8,305	7,316	7,580	6,700	8,112	7,385	6,620	7,415

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

Table 15: Average Annual Costs by Incentive Groups (RUB 5): Fiscal 2009/10

Averages for Costs		Incentives Received								
		1. Complex Care Plus Diabetes and CHF and COPD	2. Complex Care Plus CHF	3. Complex Care Plus Diabetes	4. Complex Care Plus COPD	5. Complex Care Only	6. CHF	7. Diabetes	8. COPD	8. None
Patients		308	2,574	4,778	1,097	6,771	1,087	2,651	614	16,214
Age		76.2	78.2	71.4	74.2	76.2	77.3	67.9	68.5	69.3
GP Amount		2,154	1,765	1,572	1,765	1,439	1,421	1,241	1,315	1,107
Specialist Amount		1,897	1,723	1,964	1,579	1,652	1,791	2,081	1,333	2,059
Diag Fac Amount		1,210	1,029	1,066	959	976	993	1,029	807	998
GP Specialist and Diag Fac Amounts		5,261	4,517	4,602	4,302	4,067	4,204	4,350	3,454	4,163
Hospital Costs		16,995	13,463	12,124	11,649	11,243	15,149	13,892	10,991	14,199
Pharmacare Cost		3,354	1,795	2,465	2,186	1,700	1,873	2,375	2,189	1,725
Total Costs		25,610	19,775	19,190	18,137	17,010	21,226	20,616	16,634	20,088

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

Table 16: Average Annual Costs by Disease Combinations (RUBs 3 to 5): Fiscal 2009/10

Averages for Costs		Disease Combination				
		Asthma and COPD Only	CHF Plus	CVD and IH Combos	Diabetes Plus	Other Combos
Patients		8,655	61,636	53,745	72,996	5,107
Age		58.0	75.0	70.4	63.2	57.2
GP Amount		635	978	617	738	748
Specialist Amount		489	974	619	663	885
Diag Fac Amount		403	727	536	538	661
GP Specialist and Diag Fac Amounts		1,527	2,679	1,772	1,939	2,293
Hospital Costs		2,048	6,195	2,895	2,505	3,713
Pharmacare Cost		1,303	1,594	804	1,377	1,358
Total Costs		4,878	10,468	5,472	5,821	7,365

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

Table 17: Average Annual Costs by Disease Combinations (RUB 3): Fiscal 2009/10

Averages for Costs		Disease Combination				
		Asthma and COPD Only	CHF Plus	CVD and IH Combos	Diabetes Plus	Other Combos
Patients		5,249	26,731	30,496	45,703	2,553
Age		58.2	74.1	69.7	61.8	55.6
GP Amount		465	661	458	572	503
Specialist Amount		256	380	312	323	384
Diag Fac Amount		292	505	377	380	450
GP Specialist and Diag Fac Amounts		1,013	1,546	1,147	1,275	1,338
Hospital Costs		543	1,205	733	536	663
Pharmacare Cost		890	1,324	651	1,064	919
Total Costs		2,446	4,075	2,531	2,875	2,919

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

Table 18: Average Annual Costs by Disease Combinations (RUB 4): Fiscal 2009/10

Averages for Costs		Disease Combination				
		Asthma and COPD Only	CHF Plus	CVD and IH Combos	Diabetes Plus	Other Combos
Patients		2,285	18,916	15,045	17,528	1,539
Age		57.7	75.2	70.9	64.7	57.0
GP Amount		754	972	695	873	824
Specialist Amount		594	862	729	837	930
Diag Fac Amount		507	759	650	682	753
GP Specialist and Diag Fac Amounts		1,855	2,594	2,075	2,392	2,506
Hospital Costs		2,172	4,654	3,353	2,756	3,017
Pharmacare Cost		1,636	1,638	893	1,707	1,489
Total Costs		5,664	8,885	6,321	6,855	7,012

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

Table 19: Average Annual Costs by Disease Combinations (RUB 5): Fiscal 2009/10

Averages for Costs		Disease Combination				
		Asthma and COPD Only	CHF Plus	CVD and IH Combos	Diabetes Plus	Other Combos
Patients		1,121	15,989	8,204	9,765	1,015
Age		57.2	76.1	72.2	67.3	61.7
GP Amount		1,191	1,515	1,067	1,271	1,250
Specialist Amount		1,363	2,101	1,559	1,942	2,076
Diag Fac Amount		712	1,060	918	1,016	1,049
GP Specialist and Diag Fac Amounts		3,266	4,675	3,545	4,228	4,375
Hospital Costs		8,841	16,360	10,093	11,272	12,440
Pharmacare Cost		2,555	1,993	1,213	2,253	2,267
Total Costs		14,662	23,028	14,851	17,753	19,082

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2008/10.

3.4 Discussion

There are a few points to note. For fiscal 09/10 we again conducted an analysis to see if the use of incentives for lower care needs patients at RUB 3 slows the progression to RUBs 4 and 5. As with the 08/09 report, there was no evidence in the 09/10 report that incentives have a preventive function *per se*. It may be that people who are more in need of care are somewhat more likely to receive incentive based care. The results for complex care are similar to results for other analyses we conducted on this topic. We shall continue to study this topic and look at other markers such as the percentage of people who die over time. It may also be more appropriate to look at specific diagnoses such as diabetes and chf for which we have data over a longer period of time.

Another important point to note is that it is highly recommended that annual incentives be allowed only once in a 12 month period (i.e., once one bills for a planning fee one cannot bill another planning fee until 12 months have passed), rather than annually (i.e., once per calendar year). We thought this change had been made but there are still GPs who are billing the complex care planning fee twice in a short time period, for example in November of one year and January of the next year. This does comply with the rule that says one can bill annually but would not comply if the rule was changed to once in a twelve month period. The distribution of time between billings for care plans is shown in Table 20.

Table 20: Distribution of Time Between Plans for Patients with Multiple Plans and the Same Practitioner: Fiscal 2009/10

	# of Patients
# of 30 day Periods Between Plans	
0	17
1	259
2	534
3	892
4	960
5	916
6	1,253
7	1,615
8	1,983
9	3,120
10	2,741
11	1,530
12	338
All	16,158

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Appendix A:

Methodological Update for Fiscal 09/10

The analysis of complex care incentives for 2009/10 presented a number of challenges. In January, 2010 there were 18 new diagnostic codes introduced. Twelve of these codes relate to two new categories of disease, chronic neurodegenerative disorder and chronic liver disease. The other six new diagnostic codes relate to a chronic respiratory condition. One of these, chronic respiratory condition with chronic liver disease, is a new disease combination. The others could be thought of mostly as replacement codes although they too would involve additional patients not previously eligible. For example a patient previously coded as asthma and diabetes (A250) or diabetes and COPD (D491) would now be coded as chronic respiratory condition and diabetes (R250). In addition, patients coded with R250 would now include patients with diabetes and cystic fibrosis or pulmonary fibrosis or any other restrictive conditions. Eleven codes were dropped during the year – those related to asthma (6) and those related to COPD (5). All patients with codes that were dropped could be regrouped under a new chronic respiratory condition code with the exception of those patients classified as asthma and COPD only. Note that patients with Chronic Kidney disease and COPD were coded as R491 and are now coded as R585. The group R codes have changed meaning from reporting Chronic kidney disease to reporting chronic respiratory condition.

During 2009/10 there were 131,945 incentives billed. A small number of these (6) were miscoded. The others used either the old or new valid diagnostic codes. There were a total of 115,187 unique patients who had a complex care plan (see Table 1). Some 16,756 of these patients had more than one complex care plan incentive during the year. For this analysis, patients with multiple complex care incentives during the year were grouped according to their first valid diagnostic code. Three patients had no valid code. Such patients were excluded from Tables 1 and 2.

Our initial analysis looked at patients who received a complex care plan. Some regrouping of the data was done in order to separate out the new conditions. In the tables that follow, Chronic Liver Disease includes all patients coded with a suffix of 573, including patients with N573 and R573; chronic neurodegenerative disorders include all patients coded 'N' except for N573. Asthma and COPD patients have been separated from the 'Asthma' category because during the year this code has been eliminated. The other categories correspond to the diagnostic coding on the incentive which is somewhat arbitrary. For example, a patient with diabetes and ischemic heart disease id codes as I250 and will be included under ischemic heart disease and not diabetes. Patients are grouped in a more meaningful way in later reports. Our purpose for fiscal 09/10 was to look at the new groups based on the changes for 2009/10, and to provide some comparison to other data. We review patients before any screens are applied, after applying our normal screens, and then adding the further restriction that patients must be on two registries.

Once we applied our normal screens to the data, and excluded a few "other" patients, the number of patients was reduced from 115,187 to 107,642 (see Tables 1 and 2). For 2009/10 our analysis for chronic diseases excluded patients who were not on the related registry. Applying the same principle to complex care, we looked at the data for those patients on two registries. This condition eliminates a large number of patients

from further analysis and reduces the number of included patients to 64,535 (see Table 3). Note that no registries have been reviewed for chronic neurodegenerative disorder or for chronic liver disease introduced in January, 2010. Because these were in effect for only a three month period, they are presented here but are not included in any comparison with the groups who did not receive an incentive. It would be difficult to conclude that any differences in the groups would be the result of the incentive after such a short period of time. Also only asthma and COPD registries have been reviewed for chronic respiratory conditions. The condition of two registries greatly affects the distribution of patients. Note that the number of diabetes patients drops from 24,316 to 11,781 reducing its share from 22.6 percent to 17.8% with the ischemic heart disease group while dropping from 39,706 to 29,929 patients increases its share from 36.9% to 45.3% (see Tables 2 and 3).

Note that because no registries were reviewed for chronic liver disease or for chronic neurodegenerative disorder, patients included after the two registry screen would necessarily have three conditions, that is, they would need to be on two registries other than one for their main grouping.

Finally in this section we present a summary of patients with a complex care incentive who are included for further analysis. Overall we include 64,535 patients with an average total cost of \$8,426.

Table 1: Complex Care Patients by Diagnostic Code Groups (Based on First Character of Submitted Diagnostic Code): Fiscal 2009/10*

Patients by Diagnostic Code Group		Patients	% of Patients
Asthma	A250 Asthma and Diabetes	3,204	2.78
	A414 Asthma and Ischemic Heart Disease	1,185	1.03
	A428 Asthma and Congestive Heart Failure	285	0.25
	A430 Asthma and Cerebrovascular Disease	630	0.55
	A585 Asthma and Chronic Kidney Disease	1,320	1.15
	All	6,624	5.75
Cerebrovascular Disease	C491 Cerebrovascular Disease and COPD	1,119	0.97
	C585 Cerebrovascular Disease and Chronic Kidney Disease	5,210	4.52
	All	6,329	5.49
Diabetes	D430 Diabetes and Cerebrovascular Disease	5,892	5.12
	D491 Diabetes and COPD	2,665	2.31
	D585 Diabetes and Chronic Kidney Disease	17,436	15.14
	All	25,993	22.57
Congestive Heart Failure	H250 Congestive Heart Failure and Diabetes	2,809	2.44
	H430 Congestive Heart Failure and Cerebrovascular Disease	1,074	0.93
	H491 Congestive Heart Failure and COPD	843	0.73
	H585 Congestive Heart Failure and Chronic Kidney Disease	3,198	2.78
	All	7,924	6.88
Ischemic Heart Disease	I250 Ischemic Heart Disease and Diabetes	18,335	15.92
	I428 Ischemic Heart Disease and Congestive Heart Failure	4,556	3.96
	I430 Ischemic Heart Disease and Cerebrovascular Disease	5,341	4.64
	I491 Ischemic Heart Disease and COPD	2,849	2.47
	I585 Ischemic Heart Disease and Chronic Kidney Disease	11,321	9.83
	All	42,402	36.81
Chronic Liver Disease	C573 Cerebrovascular Disease and Chronic Liver Disease	64	0.06
	D573 Diabetes and Chronic Liver Disease	553	0.48
	H573 Congestive Heart Failure and Chronic Liver Disease	37	0.03
	I573 Ischemic Heart Disease and Chronic Liver Disease	124	0.11
	K573 Chronic Kidney Disease and Chronic Liver Disease	188	0.16
	N573 Chronic Neurodegenerative Disorder and Chronic Liver Disease	110	0.10
	R573 Chronic Respiratory Condition and Chronic Liver Disease	454	0.39
All	1,530	1.33	

Patients by Diagnostic Code Group		Patients	% of Patients
Chronic Neurodegenerative Disorder	N250 Chronic Neurodegenerative Disorder and Diabetes	803	0.70
	N414 Chronic Neurodegenerative Disorder and Ischemic Heart Disease	578	0.50
	N428 Chronic Neurodegenerative Disorder and Congestive Heart Failure	164	0.14
	N430 Chronic Neurodegenerative Disorder and Cerebrovascular Disease	432	0.38
	N519 Chronic Neurodegenerative Disorder and Chronic Respiratory Condition	736	0.64
	N585 Chronic Neurodegenerative Disorder and Chronic Kidney Disease	734	0.64
	All	3,447	2.99
Asthma and COPD	A491 Asthma and COPD	2,669	2.32
	All	2,669	2.32
Chronic Respiratory Condition	R250 Chronic Respiratory Condition and Diabetes	5,792	5.03
	R414 Chronic Respiratory Condition and Ischemic Heart Disease	4,301	3.73
	R428 Chronic Respiratory Condition and Congestive Heart Failure	1,192	1.03
	R430 Chronic Respiratory Condition and Cerebrovascular Disease	1,590	1.38
	R491 Chronic Kidney Disease and COPD	2,066	1.79
	R585 Chronic Respiratory Condition and Chronic Kidney Disease	3,328	2.89
	All	18,269	15.86
All	115,187	100.00	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

* A question was raised at the GPSC meeting about why Chronic Kidney Disease was not included in Table 1 in the draft Appendix. Table 1 now presents all diagnostic codes and combinations in major groups. Chronic Kidney Disease, along with other conditions, can be seen to be included in several diagnostic codes. Tables 2 and 3 show patients and costs in their major groups. Diagnostic code K573 for Chronic Kidney Disease and Chronic Liver Disease is grouped into Chronic Liver Disease.

Table 2: Complex Care Patients by Diagnostic Group After Applying Screens Including Patients Not on Two Registries: Fiscal 2009/10

	Patients	% of Patients	Patients R.U.B.		
			3	4	5
Diagnostic Code Group					
Asthma	6,255	5.8	3,648	1,754	853
Cerebrovascular Disease	5,758	5.3	303	2,682	2,773
Diabetes	24,316	22.6	12,684	7,013	4,619
Congestive Heart Failure	7,210	6.7	2,879	2,400	1,931
Ischemic Heart Disease	39,706	36.9	17,791	13,087	8,828
Chronic Liver Disease	1,465	1.4	297	597	571
Chronic Neurodegenerative Disorder	3,224	3.0	1,282	1,075	867
Asthma and COPD	2,429	2.3	1,450	673	306
Chronic Respiratory Condition	17,279	16.1	8,550	5,435	3,294
All	107,642	100.0	48,886	34,716	24,042

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.

Table 3: Complex Care Included Patients by Diagnostic Group: Fiscal 2009/10

	Patients	Average Total Cost
Diagnostic Code Group		
Asthma	3,658	6452.6
Cerebrovascular Disease	1,779	9816.1
Diabetes	11,781	8958.0
Congestive Heart Failure	6,138	9887.1
Ischemic Heart Disease	29,929	8178.8
Asthma and COPD	885	6851.1
Chronic Respiratory Condition	10,365	8260.1
All	64,535	8425.7

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2009/10.