

British Columbia Ministry of Health Services and the General Practice Services Committee

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

Final Report: Evaluation of Chronic Disease Management Payment Incentives
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Prepared by

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HIGHLIGHTS OF FINDINGS

- The usual screens were used for the analysis of utilization and costs in this report for diabetes, chf and hypertension.
- A surprising finding in this report was that there was limited cost avoidance in fiscal 09/10 for diabetes and chf compared to 08/09. For example, for diabetes, adjusting for age, sex, RUB and attachment level, the cost avoidance based on incentives was \$15,842,116 in fiscal 08/09, while it was -\$1,645,785 for fiscal 09/10. That is, it cost more to care for patients who received incentive based care than for patients who did not.
- A range of investigations were conducted to try to understand this difference. There were changes, for fiscal 09/10, in how RUBs were calculated, and how the diabetes and chf registries were constructed. It was not possible to tease out the implications of each change. However, there was a clear finding about what happened to costs. Costs for RUB 5 patients who did not receive incentive based care were over \$1,000 lower per patient in fiscal 09/10 compared to 08/09. This accounted for most of the cost difference in regard to cost avoidance. While there were a number of changes, the main change which could have had an impact on RUB 5 patients who did not receive incentive based care was that patients who had previously paid privately for insulin (and, thus, were lower cost as they would primarily have been community based patients because if they had hospital admissions they would have already been on the registry) were added to the registries in fiscal 09/10. Thus, costs for patients not receiving incentive based care were lower and this significantly decreased the cost differential between patients who received incentive based care and those who did not.
- Another finding in our investigations was that the number of chronic disease registries a patient was on (using conditions for complex care and CDM), the higher the cost. Thus, we have added cost analyses where we control for age, sex, RUB, attachment level, and the number of registries.
- For diabetes our analysis included 126,264 patients who had received incentive based care and 103,558 patients who had not received incentives based care. The corresponding numbers for chf and hypertension were 14,486 and 47,992 and 166,465 and 193,901, respectively.
- Costs for patients with diabetes increased with age. Costs were very similar for females and males who received incentive based care, but were lower for females who had not received incentive based care (\$5,079 for females vs. \$5,570 for males). The patterns were similar for hypertension. Patterns were more mixed for chf.
- There was an inverse relationship between attachment and costs for all three conditions.

Cost Breakdowns for Diabetes, CHF and Hypertension: Fiscal 09/10

Average (Annual Cost for RUBs 3 to 5 Combined)	Type of Condition					
	Diabetes		CHF		Hypertension	
	Incentive: No	Incentive: Yes	Incentive: No	Incentive: Yes	Incentive: No	Incentive: Yes
Raw Costs	\$5,381	\$4,947	\$10,635	\$10,011	\$3,628	\$2,970
Costs Adjusted for Age, Sex and RUB	\$5,171	\$5,060	\$10,627	\$10,021	\$3,509	\$3,079
Costs Adjusted for Age, Sex, RUB and Attachment Level	\$5,041	\$5,179	\$10,482	\$10,581	\$3,436	\$3,170

Provincial Cost Avoidance Including Adjustments for Attachment Level

Diabetes		CHF		Hypertension	
Without Registries	With Registries	Without Registries	With Registries	Without Registries	With Registries
-\$21,750,285	-\$18,108,904	-\$2,130,293	-\$2,589,752	\$41,574,540	\$40,358,615

Using all adjustments including the number of registries, the net cost avoidance across the three conditions is \$19,659,959. This is a conservative estimate. The cost avoidance would be considerably higher if one only adjusted for age, sex and RUB. Attachment is not a true independent variable. It is also impacted by the use of incentives such that GPs who are high users of incentives also have higher attachment levels. The relative weight of attachment versus the use of incentives should be determined, and will be analyzed in the near future. We shall also study whether or not registries are a relevant independent variable or whether their effects are mostly covered by RUBs, as both are variables related to higher costs. The following table shows estimated cost avoidance when one only adjusts for age, sex and RUB. These are maximum numbers. We expect that the actual cost avoidance will be between these numbers and the numbers noted above where adjustments have been made for attachment levels.

	Diabetes	CHF	Hypertension
Cost Avoidance from Incentive Based Care	\$42,424,704	\$10,589,266	\$79,903,200
Cost of Incentives	\$20,104,500	\$2,510,250	-\$11,014,550
Net Cost Avoidance	\$22,320,204	\$8,079,016	\$68,888,650

TABLE OF CONTENTS

Highlights of Findings i

1. Introduction1

2. Year Over Year Comparisons.....5

3. Cost Breakdowns by Year24

4. Costs Adjusted for Differences in Distributions for Gender, Age, RUB and/or Attachment Level.....32

5. Discussion.....41

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 the Chronic Disease Management (CDM) Incentives for Diabetes, CHF and Hypertension. The Hypertension fee incentive has only been in place for four years. Thus, it is not possible to do the full longitudinal analysis on this incentive. This report focuses primarily on a longitudinal analysis of diabetes and CHF from fiscal 2002/03 to fiscal 2009/10.

It should be noted that in this report we focus on people with somewhat higher care needs. Thus, the analyses in this report typically focus on people with a RUB level of 3 or higher. In addition, it is recognized that there may be some false positives, or very low care needs diabetics, on the diabetes registry. Thus, in order to ensure that our analysis is based on active patients, who need at least a modest amount of service, we have limited the patients in the analysis to those who have had at least five services in a given year. In addition, prior analyses have indicated that relatively few patients who received incentive based care had fewer than five GP services in a year. We have shaded the areas which represent what we have selected for our analyses in the following tables. As can be seen, they represent by far the majority of patients for each group. It should also be noted that the results in this report differ somewhat from previous reports in that for diabetes and chf, patients with incentives cost more rather than less for fiscal 2009/10. This issue is reviewed in the Discussion chapter of this report.

Many readers of this report will have been trained in a health related discipline and will be familiar with concepts from the field of epidemiology such as age and sex standardization. Epidemiology deals with the correlates of disease in a population and most of the analysis focuses on populations. For example, one would age and sex standardize mortality rates across provinces to the population distribution of Canada as a whole to obtain, for example, Standardized Mortality Rates (SMRs).

However, many social science disciplines also adjust data to control for confounds based on differential age and sex distributions (and distributions in other key variables). Thus, epidemiological standardization is actually a sub-set of a broader concept of “Adjustment” which “encompasses both standardization and other procedures from removing the effects of factors that distort or *confound* comparison.”¹ In our analysis we adjust for differences in age, sex, RUB and attachment level distributions in relation to costs and utilization. However, the mathematics of standardizing for these variables is the same as for standardizing in epidemiology. The difference is that our outcome variables are not related to SMRs, or incidence or prevalence rates of a disease in a population, rather they are related to cost and utilization patterns for an experimental group and a comparison group. In this report we have used what is referred to as indirect standardization, the same approach used by the Ministry.

¹ Schoenbach, V.J. & Rosamond, W.D. (2000). *Understanding the Fundamentals of Epidemiology: An Evolving Text*. Chapel Hill, North Carolina: University of North Carolina at Chapel Hill, p. 131.

Tables 1-3 indicate the population included in our analysis in the shaded areas. As can be seen, this includes patients who receive regular care and were at the intermediate to high end of the care continuum.

Table 1: Patients with Diabetes By Services: April 2009 to March 2010

	Number of Patients	Number of Patients				% of Patients			
		Resource Utilization Band				Resource Utilization Band			
		2 or Lower	3	4	5	2 or Lower	3	4	5
All	317,464	43,488	191,225	50,563	32,188	100.0	100.0	100.0	100.0
GP Services									
03 or Lower	35,507	18,410	15,816	918	363	42.3	8.3	1.8	1.1
04	19,382	6,066	12,276	835	205	13.9	6.4	1.7	0.6
05	22,887	5,689	15,677	1,243	278	13.1	8.2	2.5	0.9
06	23,926	4,283	17,631	1,657	355	9.8	9.2	3.3	1.1
07	23,481	2,952	17,947	2,098	484	6.8	9.4	4.1	1.5
08	21,843	2,097	16,743	2,475	528	4.8	8.8	4.9	1.6
09	19,825	1,330	15,114	2,671	710	3.1	7.9	5.3	2.2
10 or More	150,613	2,661	80,021	38,666	29,265	6.1	41.8	76.5	90.9

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

**Table 2: Patients with Congestive Heart Failure By Services:
April 2009 to March 2010**

	Number of Patients	Number of Patients				% of Patients			
		Resource Utilization Band				Resource Utilization Band			
		2 or Lower	3	4	5	2 or Lower	3	4	5
All	85,095	3,050	34,844	23,361	23,840	100.0	100.0	100.0	100.0
GP Services									
03 or Lower	5,020	1,456	2,916	409	239	47.7	8.4	1.8	1.0
04	2,515	312	1,776	336	91	10.2	5.1	1.4	0.4
05	3,093	288	2,164	476	165	9.4	6.2	2.0	0.7
06	3,271	209	2,250	616	196	6.9	6.5	2.6	0.8
07	3,445	139	2,325	728	253	4.6	6.7	3.1	1.1
08	3,483	116	2,211	865	291	3.8	6.3	3.7	1.2
09	3,441	83	2,095	900	363	2.7	6.0	3.9	1.5
10 or More	60,827	447	19,107	19,031	22,242	14.7	54.8	81.5	93.3

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

Table 3: Patients with Hypertension By Services: April 2009 to March 2010

Hypertension	Number of Patients	Number of Patients						% of Patients					
		Resource Utilization Band						Resource Utilization Band					
		0	1	2	3	4	5	0	1	2	3	4	5
All	542,649	4,303	8,024	81,935	345,618	70,144	32,625	100.0	100.0	100.0	100.0	100.0	100.0
GP Services													
0	320	19	109	51	131	6	4	0.4	1.4	0.1	0.0	0.0	0.0
01	21,814	534	4,363	12,095	4,561	209	52	12.4	54.4	14.8	1.3	0.3	0.2
02	30,210	590	1,890	14,137	13,064	441	88	13.7	23.6	17.3	3.8	0.6	0.3
03	38,979	519	805	14,440	22,162	913	140	12.1	10.0	17.6	6.4	1.3	0.4
04	45,625	506	407	12,761	30,085	1,607	259	11.8	5.1	15.6	8.7	2.3	0.8
05	48,295	457	196	10,373	34,492	2,425	352	10.6	2.4	12.7	10.0	3.5	1.1
06	46,672	318	93	6,835	35,724	3,168	534	7.4	1.2	8.3	10.3	4.5	1.6
07	43,087	268	59	4,300	34,072	3,683	705	6.2	0.7	5.2	9.9	5.3	2.2
08	37,782	205	28	2,570	30,022	4,112	845	4.8	0.3	3.1	8.7	5.9	2.6
09	32,203	173	19	1,536	25,273	4,162	1,040	4.0	0.2	1.9	7.3	5.9	3.2
10 or More	197,662	714	55	2,837	116,032	49,418	28,606	16.6	0.7	3.5	33.6	70.5	87.7

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

2. YEAR OVER YEAR COMPARISONS

This section presents data on a year by year basis, that is, each year is separate and the data only pertain to the year in question. In this analysis we excluded:

- People who died in the year.
- People with hospital costs greater than \$100,000.
- People with billings for more than 25 payees.
- People with less than five GP services in the year.
- People who were in a long term care facility at the end of the 2008/09 fiscal year.
- People who were not on the respective registry.

Thus, the total number of patients in the subsequent tables are somewhat lower than those noted in Tables 1-3.

It should also be noted that while the analyses for diabetes and chf can include people with one or both of the additional conditions (e.g., for diabetes we include diabetes, only diabetes with chf, diabetes with hypertension and diabetes with chf and hypertension), this is not the case for hypertension. The hypertension data only includes people with hypertension because people with hypertension and diabetes or chf, or both are not eligible to receive the hypertension incentive.

The overall findings seem to indicate that the use of incentives appears to increase costs for the people with low to moderate care needs (i.e., RUB 3), for some conditions. The pattern, however, seems to change for RUBs four and five. This change appears to be the result of people having higher care needs and greater hospital costs.

Tables 4 to 22 present data for three years for each of the three CDM conditions: diabetes, chf and hypertension. For each of the conditions two tables are presented. The first table presents the number of patients in each cell for a number of variables such as age, gender and attachment to practice. The first line in the tables presents data for all patients, and for patients by RUB. Overall, average annual costs for females with diabetes tended to be lower than for males for females who did not receive incentive based care. The costs were fairly similar for females who receive incentives based care.

For diabetes, and hypertension, costs seem to increase with age whether or not incentive based care was provided. This pattern seems to hold across the three years of data presented and across RUBs. The pattern is more mixed for chf patients.

With regard to attachment to practice, the inverse relationship between the level of attachment and costs seems to hold across time periods, conditions and RUBs. Finally, a comparison is provided, in Table 10, regarding the average number of A1C tests, over time, for patients who did, and did not, receive incentives based care. There is a consistent pattern over time, and by RUB, which indicates that patients who receive incentives based care have about one more A1C test per year than patients who do not receive incentives based care.

Table 4: Number of Diabetes Patients: April 2007 to March 2008

Averages	Diabetes Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	88,143	59,725	18,299	10,119	110,036	77,968	21,075	10,993
Client Age Group								
0 - 44	9,973	7,262	2,165	546	7,369	5,881	1,169	319
45 - 59	23,309	17,452	3,997	1,860	28,243	22,302	4,144	1,797
60 - 69	22,201	15,637	4,249	2,315	30,899	22,628	5,472	2,799
70 - 79	20,485	12,791	4,683	3,011	28,828	19,008	6,310	3,510
80 and over	12,175	6,583	3,205	2,387	14,697	8,149	3,980	2,568
Gender								
Females	45,144	31,348	9,418	4,378	51,483	37,191	9,829	4,463
Males	42,999	28,377	8,881	5,741	58,553	40,777	11,246	6,530
Attachment to Practice								
1. Less than 40%	3,071	1,492	816	763	1,762	837	425	500
2. 40% - 59%	13,025	7,668	3,084	2,273	10,574	6,364	2,317	1,893
3. 60% - 79%	18,658	11,637	4,188	2,833	19,589	12,542	4,219	2,828
4. 80% - 89%	15,765	10,765	3,292	1,708	19,911	13,791	4,001	2,119
5. 90% or More	37,624	28,163	6,919	2,542	58,200	44,434	10,113	3,653

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

Table 5: Average Annual Total Cost for Diabetes Patients: April 2007 to March 2008

Averages	Diabetes Incentive							
	No Total Costs				Yes Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
		3	4	5		3	4	5
All	5,424	2,412	7,032	20,297	4,931	2,631	6,640	17,967
Client Age Group								
0 - 44	3,928	1,824	6,716	20,857	3,319	1,954	6,374	17,284
45 - 59	4,086	1,886	6,290	19,991	3,599	2,016	6,107	17,464
60 - 69	5,174	2,394	6,922	20,743	4,696	2,516	6,561	18,673
70 - 79	6,673	3,015	7,530	20,878	5,944	3,323	6,878	18,458
80 and over	7,569	3,328	7,587	19,241	6,804	3,505	7,002	16,965
Gender								
Females	5,213	2,452	7,257	20,588	4,916	2,787	6,998	18,071
Males	5,646	2,368	6,793	20,075	4,944	2,488	6,326	17,896
Attachment to Practice								
1. Less than 40%	12,481	3,782	10,307	31,815	13,658	3,613	12,677	31,307
2. 40% - 59%	8,167	2,757	8,796	25,568	8,436	3,066	9,147	25,622
3. 60% - 79%	6,644	2,589	8,084	21,173	6,287	2,757	7,712	19,814
4. 80% - 89%	4,882	2,296	6,746	17,585	4,862	2,561	6,711	16,340
5. 90% or More	3,521	2,217	5,358	12,972	3,597	2,535	5,336	11,689

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

Table 6: Number of Diabetes Patients: April 2008 to March 2009

Averages	Diabetes Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	92,225	62,757	19,024	10,444	118,163	84,306	22,119	11,738
Client Age Group								
0 - 44	10,243	7,418	2,291	534	7,488	5,929	1,221	338
45 - 59	24,357	18,315	4,097	1,945	29,785	23,571	4,301	1,913
60 - 69	23,576	16,608	4,475	2,493	33,906	25,174	5,803	2,929
70 - 79	21,350	13,592	4,739	3,019	30,529	20,271	6,535	3,723
80 and over	12,699	6,824	3,422	2,453	16,455	9,361	4,259	2,835
Gender								
Females	47,260	32,917	9,810	4,533	55,279	40,196	10,168	4,915
Males	44,965	29,840	9,214	5,911	62,884	44,110	11,951	6,823
Attachment to Practice								
1. Less than 40%	3,310	1,560	895	855	2,137	968	545	624
2. 40% - 59%	13,966	8,250	3,263	2,453	12,458	7,524	2,787	2,147
3. 60% - 79%	20,251	12,611	4,684	2,956	21,977	14,072	4,684	3,221
4. 80% - 89%	16,676	11,527	3,391	1,758	21,914	15,575	4,160	2,179
5. 90% or More	38,022	28,809	6,791	2,422	59,677	46,167	9,943	3,567

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

Table 7: Average Annual Total Cost for Diabetes Patients: April 2008 to March 2009

Averages	Diabetes Incentive							
	No Total Costs				Yes Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
		3	4	5		3	4	5
All	5,466	2,445	6,969	20,878	4,937	2,623	6,659	18,312
Client Age Group								
0 - 44	3,993	1,888	6,580	22,134	3,405	2,021	6,294	17,248
45 - 59	4,133	1,958	6,318	20,014	3,605	2,041	5,993	17,500
60 - 69	5,199	2,362	6,863	21,115	4,609	2,502	6,447	19,079
70 - 79	6,588	3,080	7,376	21,146	5,948	3,246	7,069	18,690
80 and over	7,818	3,296	7,585	20,721	6,845	3,445	7,095	17,698
Gender								
Females	5,225	2,527	6,935	21,117	4,938	2,777	7,014	18,309
Males	5,719	2,354	7,006	20,696	4,936	2,482	6,357	18,314
Attachment to Practice								
1. Less than 40%	12,465	3,316	10,739	30,963	15,018	4,105	12,350	34,277
2. 40% - 59%	8,415	2,921	8,785	26,397	8,135	3,062	8,769	25,089
3. 60% - 79%	6,698	2,655	7,845	22,129	6,394	2,880	7,689	19,862
4. 80% - 89%	4,816	2,363	6,550	17,558	4,633	2,562	6,676	15,535
5. 90% or More	3,402	2,202	5,205	12,613	3,483	2,462	5,262	11,737

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

Table 8: Number of Diabetes Patients: April 2009 to March 2010

Averages	Diabetes Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	103,558	70,079	21,534	11,945	126,264	89,361	24,092	12,811
Client Age Group								
0 - 44	11,448	8,297	2,551	600	7,792	6,176	1,248	368
45 - 59	27,362	20,636	4,546	2,180	31,130	24,626	4,529	1,975
60 - 69	26,969	18,908	5,196	2,865	36,620	27,013	6,418	3,189
70 - 79	23,108	14,502	5,377	3,229	32,635	21,459	7,150	4,026
80 and over	14,671	7,736	3,864	3,071	18,087	10,087	4,747	3,253
Gender								
Females	53,179	36,729	11,146	5,304	59,000	42,523	11,090	5,387
Males	50,379	33,350	10,388	6,641	67,264	46,838	13,002	7,424
Attachment to Practice								
1. Less than 40%	4,159	2,003	1,092	1,064	2,426	1,123	597	706
2. 40% - 59%	16,197	9,460	3,855	2,882	13,207	7,816	2,923	2,468
3. 60% - 79%	22,581	14,049	5,238	3,294	24,000	15,145	5,313	3,542
4. 80% - 89%	18,499	12,771	3,832	1,896	23,233	16,315	4,558	2,360
5. 90% or More	42,122	31,796	7,517	2,809	63,398	48,962	10,701	3,735

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

Table 9: Average Annual Total Cost for Diabetes Patients: April 2009 to March 2010

Averages	Diabetes Incentive							
	No Total Costs				Yes Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
		3	4	5		3	4	5
All	5,318	2,393	6,838	19,738	4,947	2,600	6,647	18,122
Client Age Group								
0 - 44	3,907	1,911	6,507	20,462	3,576	1,990	6,655	19,747
45 - 59	3,984	1,892	6,041	19,494	3,562	2,012	6,045	17,193
60 - 69	5,017	2,312	6,600	19,996	4,527	2,456	6,489	18,123
70 - 79	6,374	3,025	7,309	19,862	5,912	3,213	6,826	18,674
80 and over	7,796	3,259	7,658	19,399	7,034	3,494	7,164	17,819
Gender								
Females	5,079	2,437	6,915	19,514	4,952	2,772	6,852	18,256
Males	5,570	2,344	6,754	19,917	4,943	2,445	6,472	18,025
Attachment to Practice								
1. Less than 40%	12,262	3,458	10,836	30,301	14,841	4,005	13,004	33,631
2. 40% - 59%	8,107	2,845	8,468	24,897	8,409	3,071	8,901	24,732
3. 60% - 79%	6,376	2,562	7,718	20,510	6,372	2,908	7,654	19,263
4. 80% - 89%	4,653	2,335	6,456	16,630	4,669	2,548	6,577	15,638
5. 90% or More	3,284	2,140	5,002	11,637	3,411	2,415	5,207	11,312

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

Table 10: Average Number of A1C Tests by Year For All Patients with Diabetes

Average Number of A1C Tests			Diabetes Incentive						
			No						
			Year						
			200304	200405	200506	200607	200708	200809	200910
RUB									
3			1.44	1.45	1.44	1.42	1.34	1.36	1.37
4			1.47	1.45	1.48	1.42	1.46	1.42	1.45
5			1.50	1.51	1.55	1.52	1.48	1.46	1.50

Average Number of A1C Tests			Diabetes Incentive						
			Yes						
			Year						
			200304	200405	200506	200607	200708	200809	200910
RUB									
3			2.22	2.28	2.35	2.39	2.39	2.42	2.43
4			2.34	2.43	2.49	2.52	2.60	2.61	2.61
5			2.39	2.47	2.56	2.61	2.67	2.66	2.66

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

Table 11: Number of Congestive Heart Failure Patients: April 2007 to March 2008

Averages	CHF Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	44,133	19,605	13,294	11,234	12,511	5,226	4,047	3,238
Client Age Group								
0 - 44	951	425	349	177	107	48	35	24
45 - 59	4,426	2,157	1,231	1,038	836	413	240	183
60 - 69	8,132	3,885	2,291	1,956	1,889	882	571	436
70 - 79	13,512	6,016	4,056	3,440	3,734	1,541	1,217	976
80 and over	17,112	7,122	5,367	4,623	5,945	2,342	1,984	1,619
Gender								
Females	21,010	9,562	6,380	5,068	5,531	2,416	1,781	1,334
Males	23,123	10,043	6,914	6,166	6,980	2,810	2,266	1,904
Attachment to Practice								
1. Less than 40%	1,455	300	383	772	179	24	45	110
2. 40% - 59%	6,095	1,855	1,814	2,426	1,204	295	375	534
3. 60% - 79%	9,383	3,310	2,906	3,167	2,149	616	707	826
4. 80% - 89%	8,176	3,550	2,582	2,044	2,291	772	836	683
5. 90% or More	19,024	10,590	5,609	2,825	6,688	3,519	2,084	1,085

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

Table 12: Average Annual Total Cost for Congestive Heart Failure Patients: April 2007 to March 2008

Averages	CHF Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	10,472	3,961	8,947	23,637	10,083	4,561	8,572	20,883
Client Age Group								
0 - 44	11,450	3,186	12,471	29,282	10,465	2,878	7,558	29,879
45 - 59	10,290	3,474	9,395	25,517	9,152	3,837	8,168	22,437
60 - 69	10,639	3,803	9,017	26,114	10,597	4,619	8,847	24,983
70 - 79	10,958	4,251	8,909	25,104	10,800	4,916	8,933	22,419
80 and over	10,000	3,996	8,615	20,859	9,593	4,468	8,339	18,544
Gender								
Females	10,447	4,101	9,444	23,683	9,871	4,775	8,757	20,586
Males	10,494	3,827	8,489	23,600	10,251	4,377	8,427	21,091
Attachment to Practice								
1. Less than 40%	25,178	6,300	14,952	37,588	32,213	9,584	18,227	42,872
2. 40% - 59%	17,428	5,212	12,572	30,400	19,004	6,294	13,886	29,618
3. 60% - 79%	13,442	4,731	10,936	24,846	14,627	5,778	10,976	24,353
4. 80% - 89%	9,517	3,871	8,709	20,343	10,274	5,030	8,874	17,916
5. 90% or More	6,063	3,465	6,445	15,045	6,359	4,066	6,471	13,581

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

Table 13: Number of Congestive Heart Failure Patients: April 2008 to March 2009

Averages	CHF Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	45,335	20,217	13,683	11,435	13,367	5,679	4,220	3,468
Client Age Group								
0 - 44	933	431	315	187	134	52	58	24
45 - 59	4,584	2,240	1,271	1,073	928	422	290	216
60 - 69	8,657	4,141	2,553	1,963	1,966	967	582	417
70 - 79	13,526	6,137	3,983	3,406	3,918	1,665	1,234	1,019
80 and over	17,635	7,268	5,561	4,806	6,421	2,573	2,056	1,792
Gender								
Females	21,426	9,892	6,416	5,118	5,905	2,569	1,837	1,499
Males	23,909	10,325	7,267	6,317	7,462	3,110	2,383	1,969
Attachment to Practice								
1. Less than 40%	1,600	315	412	873	271	59	63	149
2. 40% - 59%	6,738	2,095	1,993	2,650	1,355	367	410	578
3. 60% - 79%	10,203	3,714	3,291	3,198	2,612	788	862	962
4. 80% - 89%	8,360	3,726	2,643	1,991	2,567	1,017	815	735
5. 90% or More	18,434	10,367	5,344	2,723	6,562	3,448	2,070	1,044

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

Table 14: Average Annual Total Cost for Congestive Heart Failure Patients: April 2008 to March 2009

Averages	CHF Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	10,669	4,012	8,993	24,442	9,930	4,328	8,592	20,731
Client Age Group								
0 - 44	11,863	3,617	11,138	32,089	9,069	4,146	8,748	20,512
45 - 59	10,954	3,594	9,462	28,086	10,937	4,273	10,044	25,156
60 - 69	10,581	3,774	9,141	26,811	9,953	4,255	8,838	24,724
70 - 79	11,016	4,279	9,317	25,143	10,459	4,606	8,944	21,856
80 and over	10,308	4,075	8,465	21,868	9,472	4,189	8,101	18,631
Gender								
Females	10,697	4,244	9,448	24,737	9,904	4,390	8,728	20,796
Males	10,643	3,791	8,591	24,204	9,950	4,277	8,486	20,681
Attachment to Practice								
1. Less than 40%	27,065	6,830	15,945	39,614	28,276	6,842	17,941	41,134
2. 40% - 59%	17,459	5,468	12,412	30,734	17,719	6,046	12,795	28,623
3. 60% - 79%	13,028	4,606	10,469	25,440	13,897	5,370	11,317	23,193
4. 80% - 89%	9,644	4,100	8,933	20,964	9,970	4,624	8,773	18,694
5. 90% or More	5,923	3,388	6,302	14,826	5,969	3,777	6,268	12,615

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

Table 15: Number of Congestive Heart Failure Patients: April 2009 to March 2010

Averages	CHF Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	47,992	20,894	14,605	12,493	14,486	6,069	4,592	3,825
Client Age Group								
0 - 44	1,010	440	363	207	160	83	52	25
45 - 59	4,765	2,314	1,356	1,095	1,039	519	296	224
60 - 69	9,086	4,350	2,613	2,123	2,252	1,061	689	502
70 - 79	13,932	6,122	4,241	3,569	4,099	1,697	1,314	1,088
80 and over	19,199	7,668	6,032	5,499	6,936	2,709	2,241	1,986
Gender								
Females	22,734	10,047	6,977	5,710	6,364	2,694	2,049	1,621
Males	25,258	10,847	7,628	6,783	8,122	3,375	2,543	2,204
Attachment to Practice								
1. Less than 40%	1,959	414	557	988	343	66	90	187
2. 40% - 59%	7,395	2,163	2,223	3,009	1,504	355	473	676
3. 60% - 79%	10,817	3,821	3,464	3,532	2,846	873	947	1,026
4. 80% - 89%	8,804	3,891	2,819	2,094	2,789	1,105	888	796
5. 90% or More	19,017	10,605	5,542	2,870	7,004	3,670	2,194	1,140

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

Table 16: Average Annual Total Cost for Congestive Heart Failure Patients: April 2009 to March 2010

Averages	CHF Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	10,635	4,029	8,994	23,601	10,011	4,228	8,485	21,017
Client Age Group								
0 - 44	12,212	3,261	11,446	32,580	9,326	4,151	9,784	25,555
45 - 59	10,885	3,476	9,420	28,355	10,002	3,943	8,134	26,506
60 - 69	10,384	3,770	8,777	25,915	9,872	4,007	9,265	23,102
70 - 79	10,817	4,241	8,973	24,289	10,415	4,489	8,541	21,921
80 and over	10,476	4,217	8,859	20,978	9,834	4,208	8,229	19,318
Gender								
Females	10,784	4,225	9,469	23,933	10,000	4,498	8,639	20,863
Males	10,500	3,847	8,559	23,322	10,019	4,013	8,361	21,130
Attachment to Practice								
1. Less than 40%	25,375	6,446	16,443	38,342	27,114	7,984	17,489	38,497
2. 40% - 59%	17,258	5,404	12,744	29,113	19,411	6,626	12,580	30,905
3. 60% - 79%	13,008	4,768	10,496	24,386	13,480	5,222	10,475	23,281
4. 80% - 89%	9,384	4,061	8,340	20,678	9,561	4,451	8,892	17,402
5. 90% or More	5,771	3,376	6,134	13,916	5,923	3,625	6,209	12,772

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

Table 17: Number of Hypertension Patients: April 2007 to March 2008

	Hypertension Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	186,661	137,940	34,655	14,066	152,926	120,154	23,473	9,299
Client Age Group								
0 - 44	19,218	14,505	4,097	616	7,610	6,468	969	173
45 - 59	53,414	43,211	7,523	2,680	40,348	34,821	4,262	1,265
60 - 69	45,383	34,850	7,630	2,903	40,286	33,048	5,410	1,828
70 - 79	40,561	28,159	8,413	3,989	38,706	28,838	6,991	2,877
80 and over	28,085	17,215	6,992	3,878	25,976	16,979	5,841	3,156
Gender								
Females	108,976	82,074	20,029	6,873	89,335	71,238	13,238	4,859
Males	77,685	55,866	14,626	7,193	63,591	48,916	10,235	4,440
Attachment to Practice								
1. Less than 40%	6,225	3,668	1,578	979	2,095	1,272	465	358
2. 40% - 59%	29,181	19,761	6,212	3,208	15,068	10,814	2,764	1,490
3. 60% - 79%	41,806	29,232	8,747	3,827	28,707	21,104	5,216	2,387
4. 80% - 89%	35,814	27,040	6,273	2,501	30,470	24,009	4,568	1,893
5. 90% or More	73,635	58,239	11,845	3,551	76,586	62,955	10,460	3,171

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

Table 18: Average Annual Total Cost for Hypertension Patients: April 2007 to March 2008

Averages	Hypertension Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	3,517	1,894	5,509	14,530	2,877	1,767	4,973	11,925
Client Age Group								
0 - 44	2,735	1,359	5,496	16,775	1,766	1,126	4,431	10,784
45 - 59	2,609	1,469	4,966	14,378	1,899	1,261	4,186	11,743
60 - 69	3,273	1,844	5,282	15,147	2,576	1,682	4,950	11,720
70 - 79	4,255	2,385	5,750	14,301	3,535	2,220	5,273	12,495
80 and over	5,109	2,709	6,057	14,054	4,208	2,446	5,300	11,660
Gender								
Females	3,398	1,947	5,580	14,359	2,880	1,854	5,140	11,770
Males	3,685	1,815	5,410	14,694	2,873	1,641	4,757	12,095
Attachment to Practice								
1. Less than 40%	7,208	2,684	8,380	22,266	7,724	2,846	9,886	22,250
2. 40% - 59%	4,990	2,228	6,751	18,597	4,441	2,188	6,603	16,785
3. 60% - 79%	4,209	2,122	6,091	15,847	3,685	2,050	5,747	13,635
4. 80% - 89%	3,183	1,858	5,289	12,228	2,825	1,764	5,037	10,949
5. 90% or More	2,391	1,632	4,161	8,927	2,154	1,580	3,910	7,772

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

Table 19: Number of Hypertension Patients: April 2008 to March 2009

	Hypertension Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	184,647	136,056	34,704	13,887	161,608	126,645	25,049	9,914
Client Age Group								
0 - 44	18,826	14,167	3,995	664	7,703	6,549	979	175
45 - 59	52,890	42,437	7,861	2,592	42,149	36,231	4,608	1,310
60 - 69	46,125	35,375	7,748	3,002	43,382	35,362	5,978	2,042
70 - 79	39,332	27,306	8,257	3,769	40,791	30,423	7,293	3,075
80 and over	27,474	16,771	6,843	3,860	27,583	18,080	6,191	3,312
Gender								
Females	107,160	80,461	19,921	6,778	93,965	74,568	14,311	5,086
Males	77,487	55,595	14,783	7,109	67,643	52,077	10,738	4,828
Attachment to Practice								
1. Less than 40%	6,415	3,767	1,644	1,004	2,382	1,425	580	377
2. 40% - 59%	28,726	19,402	6,209	3,115	16,447	11,615	3,136	1,696
3. 60% - 79%	41,388	29,075	8,492	3,821	30,637	22,536	5,572	2,529
4. 80% - 89%	35,657	26,707	6,482	2,468	31,943	25,080	4,898	1,965
5. 90% or More	72,461	57,105	11,877	3,479	80,199	65,989	10,863	3,347

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

Table 20: Average Annual Total Cost By for Hypertension Patients: April 2008 to March 2009

Averages	Hypertension Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	3,579	1,924	5,581	14,788	2,949	1,794	5,056	12,377
Client Age Group								
0 - 44	2,850	1,494	5,593	15,281	1,869	1,139	4,768	12,959
45 - 59	2,700	1,540	5,000	14,713	1,976	1,331	4,412	11,244
60 - 69	3,334	1,865	5,462	15,154	2,639	1,676	4,906	12,683
70 - 79	4,281	2,350	5,808	14,924	3,573	2,222	5,280	12,883
80 and over	5,174	2,688	6,100	14,336	4,303	2,471	5,461	12,136
Gender								
Females	3,429	1,954	5,646	14,422	2,944	1,870	5,198	12,356
Males	3,785	1,880	5,492	15,137	2,956	1,686	4,866	12,398
Attachment to Practice								
1. Less than 40%	7,374	2,773	8,112	23,426	7,747	2,944	8,745	24,369
2. 40% - 59%	5,092	2,282	7,121	18,552	4,759	2,318	6,856	17,594
3. 60% - 79%	4,271	2,157	6,164	16,146	3,784	2,066	6,059	14,083
4. 80% - 89%	3,230	1,871	5,284	12,538	2,895	1,793	5,065	11,553
5. 90% or More	2,419	1,652	4,170	9,031	2,138	1,585	3,820	7,577

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

Table 21: Number of Hypertension Patients: April 2009 to March 2010

	Hypertension Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	193,901	141,606	36,509	15,786	166,465	128,969	26,730	10,766
Client Age Group								
0 - 44	19,562	15,013	3,859	690	7,553	6,436	933	184
45 - 59	55,368	44,249	8,178	2,941	42,412	36,288	4,672	1,452
60 - 69	49,355	37,449	8,423	3,483	45,634	37,165	6,356	2,113
70 - 79	40,407	27,655	8,585	4,167	41,764	30,516	7,935	3,313
80 and over	29,209	17,240	7,464	4,505	29,102	18,564	6,834	3,704
Gender								
Females	111,988	83,400	20,724	7,864	96,402	75,600	15,162	5,640
Males	81,913	58,206	15,785	7,922	70,063	53,369	11,568	5,126
Attachment to Practice								
1. Less than 40%	7,365	4,325	1,840	1,200	2,963	1,819	687	457
2. 40% - 59%	31,244	20,949	6,721	3,574	17,707	12,390	3,472	1,845
3. 60% - 79%	44,292	30,576	9,229	4,487	32,765	23,747	6,174	2,844
4. 80% - 89%	36,625	27,417	6,501	2,707	32,705	25,374	5,179	2,152
5. 90% or More	74,375	58,339	12,218	3,818	80,325	65,639	11,218	3,468

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

Table 22: Average Annual Total Cost By for Hypertension Patients: April 2009 to March 2010

Averages	Hypertension Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	3,628	1,909	5,572	14,550	2,970	1,781	5,020	12,115
Client Age Group								
0 - 44	2,811	1,401	5,902	16,200	1,983	1,170	5,177	14,248
45 - 59	2,765	1,543	5,147	14,533	2,017	1,309	4,520	11,656
60 - 69	3,374	1,845	5,371	14,983	2,571	1,653	4,862	11,839
70 - 79	4,289	2,349	5,662	14,335	3,548	2,175	5,197	12,247
80 and over	5,326	2,727	5,990	14,172	4,407	2,523	5,284	12,228
Gender								
Females	3,515	1,957	5,636	14,448	2,983	1,875	5,187	11,914
Males	3,782	1,841	5,488	14,651	2,951	1,648	4,803	12,336
Attachment to Practice								
1. Less than 40%	7,361	2,856	8,227	22,272	7,345	2,965	8,140	23,585
2. 40% - 59%	5,124	2,322	6,959	18,096	4,773	2,278	7,135	17,085
3. 60% - 79%	4,351	2,092	6,283	15,767	3,773	2,061	5,821	13,628
4. 80% - 89%	3,251	1,827	5,256	12,855	2,833	1,753	4,791	10,849
5. 90% or More	2,385	1,634	4,040	8,575	2,138	1,564	3,840	7,505

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

3. COST BREAKDOWNS BY YEAR

Tables 23 to 31 present cost breakdowns by year and RUB for the three CDM conditions. As can be seen, for RUB 3, the main costs are typically MSP related costs (costs for GPs, Specialists and diagnostic services). For RUBs 4 and 5 the main costs are for hospital care. For RUB 3 the comparative costs, for patients who did and did not receive incentives based care, are mixed across conditions. However, for RUBs 4 and 5, costs were typically lower for patients who received incentives based care. This is primarily due to the avoidance of hospital costs for RUBs 4 and 5 patients who received incentives based care.

Table 23: Average Annual Cost Summaries by Year for Patients with Diabetes: RUB 3

Resource Utilization Band 3

Averages		Diabetes Incentive						
		No						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	362	359	352	362	423	409	420
	GP Specialist and Diag Fac Amounts	999	971	970	997	1,038	1,053	1,064
	Pharmacy Costs	741	797	809	807	759	753	728
	Hospital Costs	664	715	702	675	615	639	602
	Total Costs	2,404	2,483	2,482	2,479	2,412	2,445	2,393

Resource Utilization Band 3

Averages		Diabetes Incentive						
		Yes						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	435	427	420	471	614	566	587
	GP Specialist and Diag Fac Amounts	1,102	1,050	1,063	1,120	1,224	1,199	1,226
	Pharmacy Costs	873	924	935	969	921	929	911
	Hospital Costs	552	572	561	537	486	494	463
	Total Costs	2,528	2,547	2,559	2,626	2,631	2,623	2,600

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

Table 24: Average Annual Cost Summaries by Year for Patients with Diabetes: RUB 4

Resource Utilization Band 4

Averages		Diabetes Incentive						
		No						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	638	623	608	623	765	714	744
	GP Specialist and Diag Fac Amounts	2,118	2,032	2,029	2,083	2,198	2,194	2,240
	Pharmacy Costs	1,294	1,380	1,409	1,435	1,422	1,404	1,381
	Hospital Costs	3,951	4,040	3,847	3,692	3,411	3,371	3,216
	Total Costs	7,364	7,452	7,285	7,211	7,032	6,969	6,838

Resource Utilization Band 4

Averages		Diabetes Incentive						
		Yes						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	727	699	679	730	1,024	905	942
	GP Specialist and Diag Fac Amounts	2,240	2,132	2,104	2,202	2,363	2,292	2,353
	Pharmacy Costs	1,480	1,559	1,637	1,651	1,634	1,646	1,611
	Hospital Costs	3,557	3,582	3,457	3,390	2,643	2,721	2,683
	Total Costs	7,276	7,273	7,198	7,243	6,640	6,659	6,647

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

Table 25: Average Annual Cost Summaries by Year for Patients with Diabetes: RUB 5

Resource Utilization Band 5

Averages		Diabetes Incentive						
		No						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	1,048	1,009	1,006	1,029	1,214	1,167	1,226
	GP Specialist and Diag Fac Amounts	4,067	3,929	3,994	4,065	4,159	4,212	4,265
	Pharmacy Costs	1,803	1,951	2,025	2,040	2,051	2,040	1,988
	Hospital Costs	14,969	15,387	15,209	14,635	14,087	14,625	13,486
	Total Costs	20,839	21,267	21,228	20,740	20,297	20,878	19,738

Resource Utilization Band 5

Averages		Diabetes Incentive						
		Yes						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	1,126	1,070	1,050	1,121	1,473	1,339	1,408
	GP Specialist and Diag Fac Amounts	4,103	3,839	3,871	3,965	4,126	4,109	4,213
	Pharmacy Costs	2,101	2,103	2,278	2,265	2,189	2,265	2,163
	Hospital Costs	13,219	13,420	12,851	13,095	11,652	11,937	11,747
	Total Costs	19,424	19,362	19,000	19,325	17,967	18,312	18,122

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

Table 26: Average Annual Cost Summaries by Year for Patients with Heart Disease: RUB 3

Resource Utilization Band 3

Averages		Heart Failure Incentive						
		No						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	453	448	437	455	627	569	599
	GP Specialist and Diag Fac Amounts	1,302	1,265	1,267	1,298	1,458	1,438	1,478
	Pharmacy Costs	1,168	1,273	1,313	1,362	1,324	1,348	1,319
	Hospital Costs	1,500	1,543	1,413	1,284	1,179	1,227	1,231
	Total Costs	3,970	4,081	3,993	3,944	3,961	4,012	4,029

Resource Utilization Band 3

Averages		Heart Failure Incentive						
		Yes						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	595	566	552	603	1,015	830	877
	GP Specialist and Diag Fac Amounts	1,549	1,389	1,437	1,467	1,880	1,734	1,780
	Pharmacy Costs	1,232	1,301	1,328	1,376	1,423	1,379	1,340
	Hospital Costs	1,545	1,578	1,498	1,276	1,257	1,215	1,108
	Total Costs	4,325	4,268	4,263	4,118	4,561	4,328	4,228

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

Table 27: Average Annual Cost Summaries by Year for Patients with Heart Disease: RUB 4

Resource Utilization Band 4

Averages		Heart Failure Incentive						
		No						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	725	710	695	718	957	859	914
	GP Specialist and Diag Fac Amounts	2,363	2,242	2,239	2,314	2,507	2,468	2,569
	Pharmacy Costs	1,413	1,536	1,618	1,683	1,692	1,679	1,649
	Hospital Costs	5,816	5,954	5,668	5,513	4,749	4,846	4,776
	Total Costs	9,593	9,732	9,525	9,510	8,947	8,993	8,994

Resource Utilization Band 4

Averages		Heart Failure Incentive						
		Yes						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	879	834	810	851	1,330	1,121	1,159
	GP Specialist and Diag Fac Amounts	2,397	2,283	2,260	2,315	2,740	2,636	2,654
	Pharmacy Costs	1,431	1,524	1,564	1,524	1,643	1,673	1,619
	Hospital Costs	5,397	5,449	5,071	4,759	4,189	4,283	4,212
	Total Costs	9,225	9,256	8,895	8,597	8,572	8,592	8,485

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

Table 28: Average Annual Cost Summaries by Year for Patients with Heart Disease: RUB 5

Resource Utilization Band 5

Averages		Heart Failure Incentive						
		No						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	1,163	1,146	1,141	1,171	1,436	1,363	1,455
	GP Specialist and Diag Fac Amounts	4,257	4,166	4,172	4,314	4,514	4,633	4,709
	Pharmacy Costs	1,714	1,811	1,972	2,018	2,041	2,077	2,011
	Hospital Costs	17,587	18,390	17,913	18,013	17,082	17,732	16,881
	Total Costs	23,557	24,367	24,057	24,344	23,637	24,442	23,601

Resource Utilization Band 5

Averages		Heart Failure Incentive						
		Yes						
		Year						
		200304	200405	200506	200607	200708	200809	200910
Average	GP Amount	1,332	1,265	1,261	1,342	1,822	1,618	1,719
	GP Specialist and Diag Fac Amounts	4,322	4,002	4,074	4,184	4,502	4,337	4,526
	Pharmacy Costs	1,801	1,765	1,893	2,000	1,997	2,063	1,964
	Hospital Costs	16,794	16,658	16,153	16,076	14,384	14,330	14,527
	Total Costs	22,917	22,426	22,119	22,260	20,883	20,731	21,017

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

Table 29: Average Annual Cost Summaries by Year for Hypertension Patients: RUB 3

R.U.B. 3

Averages for Costs		Hypertension Incentive								
		No					Yes			
		200506	200607	200708	200809	200910	200607	200708	200809	200910
GP Amount		334	335	358	357	374	374	401	395	413
GP Specialist and Diag Fac Amounts		844	873	900	921	944	881	900	912	937
Hospital Costs		594	613	611	622	598	504	482	497	471
Pharmacare Cost		411	405	383	381	367	418	385	385	373
Total Costs		1,849	1,891	1,894	1,924	1,909	1,803	1,767	1,794	1,781

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

Table 30: Average Annual Cost Summaries by Year for Hypertension Patients: RUB 4

R.U.B. 4

Averages for Costs		Hypertension Incentive								
		No					Yes			
		200506	200607	200708	200809	200910	200607	200708	200809	200910
GP Amount		563	573	641	624	657	603	720	675	711
GP Specialist and Diag Fac Amounts		1,770	1,834	1,899	1,921	1,981	1,820	1,883	1,876	1,923
Hospital Costs		2,959	3,036	2,833	2,865	2,803	2,663	2,320	2,389	2,286
Pharmacare Cost		774	759	777	794	787	791	770	790	811
Total Costs		5,503	5,629	5,509	5,581	5,572	5,274	4,973	5,056	5,020

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

Table 31: Average Annual Cost Summaries by Year for Hypertension Patients: RUB 5

R.U.B. 5

Averages for Costs		Hypertension Incentive								
		No					Yes			
		200506	200607	200708	200809	200910	200607	200708	200809	200910
GP Amount		845	864	995	967	1,029	865	1,072	994	1,048
GP Specialist and Diag Fac Amounts		3,037	3,192	3,308	3,373	3,437	3,105	3,096	3,129	3,176
Hospital Costs		9,989	10,576	10,030	10,201	9,901	9,147	7,740	8,207	7,858
Pharmacare Cost		1,161	1,165	1,192	1,215	1,213	1,084	1,089	1,041	1,081
Total Costs		14,188	14,933	14,530	14,788	14,550	13,336	11,925	12,377	12,115

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

4. COSTS ADJUSTED FOR DIFFERENCES IN DISTRIBUTIONS FOR GENDER, AGE, RUB AND/OR ATTACHMENT LEVEL

So far in this report we have found that it appears that patients who receive incentives based care cost less than patients who do not. While this is an important finding it could be a *spurious* finding, that is, the difference in costs could be accounted for by other factors that are also known to impact costs, such as age. For example, if the patients who receive incentive based care are young and, therefore, cost less (in general costs are lower for younger people as was shown earlier in this report), and patients who do not receive incentives based care are older, and cost more, then the finding that patients who receive incentives based care cost less could be an artifact of the different age distributions between the two groups. Thus, in this section we adjust for the potential impact that other factors could have on the findings.

Tables 32, 34 and 36 present average annual cost data adjusted for differences in age and sex distributions. As can be seen, the adjusted costs are similar to the raw, or unadjusted, costs. For example, Table 32 shows a total cost of \$2,422 and \$2,580 for RUB 3 diabetes patients who did not, and did, receive incentives based care. The unadjusted costs were \$2,393 and \$2,600 (see Table 23 and/or Table 9). Overall, the finding was that, except for hypertension, costs were higher for RUB 3 patients who received incentives based care. For RUBs 4 and 5 the costs, adjusted for differences in age and sex distributions, were lower for patients who received incentives based care.

Tables 33, 35 and 37 show results for adjustments for gender, age and RUB distributions. When all three RUB levels are combined, there is a consistent, lower cost for patients who received incentives based care. However, the patients also have higher, average attachment levels. This could account for the observed differences. Thus, it is important to adjust for differences in attachment levels between the two groups.

Tables 38 to 45 shed light on this issue. There is a set of three tables for each condition. The first table in each set (Tables 38, 41 and 44) present age and sex adjusted costs by

attachment level and RUB. For hypertension, costs are lower for RUBs 4 and 5, within levels of attachment, for patients who received incentives based care.

The second table in each set (Table 39, 42 and 45) presents costs, adjusted for differences in gender, age and RUB distributions, within attachment level. Again while the picture is somewhat mixed for diabetes, there is a clear pattern for hypertension patients of adjusted costs being lower for patients who received incentives based care.

Finally, Tables 40, 43 and 46 present the data adjusted for gender, age, RUB and attachment level. These tables indicate a slightly higher adjusted cost for diabetes patients who received incentives based care. The results are similar for chf. We can now compare the differences in costs where adjustments have been made for gender, age and RUB (recall that those who received incentives based care had higher attachment levels), and for the above three factors and attachment. These results are presented in Table 47. As can be seen in Table 47, costs for patients who received incentive based care was lower for the unadjusted cost, and for costs standardized for differences in age, sex and RUB distributions. It is only when one adjusts for age, sex, RUB and attachment level that the costs become higher for patients who received incentive based care for diabetes and chf.

Table 32: Average Annual Costs for Diabetes within RUB Adjusted for Differences in Gender and Age Group Distributions for April 2009 to March 2010

	Resource Utilization Band					
	3		4		5	
	Diabetes Incentive		Diabetes Incentive		Diabetes Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	424	583	747	938	1,226	1,407
Specialist Amount	307	284	850	775	2,048	1,841
Diag Fac Amount	343	351	646	638	991	967
GP Specialist and Diag Fac Amounts	1,073	1,219	2,242	2,351	4,265	4,215
Hospital Costs	611	458	3,243	2,675	13,513	11,724
Pharmacy Costs	737	903	1,388	1,614	1,966	2,179
Total Cost	2,422	2,580	6,873	6,640	19,744	18,118
Attachment to Practice	82	86	77	81	71	75

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

Table 33: Average Annual Costs for Diabetes Adjusted for Differences in RUB, Gender, and Age Group for April 2009 to March 2010

	Diabetes Incentive	
	No Incentive	Incentive
GP Amount	574	742
Specialist Amount	602	549
Diag Fac Amount	473	475
GP Specialist and Diag Fac Amounts	1,649	1,766
Hospital Costs	2,524	2,112
Pharmacy Costs	998	1,182
Total Cost	5,171	5,060
Attachment to Practice	80	84

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

Table 34: Average Annual Costs for Congestive Heart Failure within RUB Adjusted for Differences in Gender and Age Group Distributions for April 2009 to March 2010

	Resource Utilization Band					
	3		4		5	
	Heart Failure Incentive		Heart Failure Incentive		Heart Failure Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	602	866	918	1,146	1,458	1,705
Specialist Amount	387	356	887	755	2,166	1,824
Diag Fac Amount	489	560	756	767	1,055	1,064
GP Specialist and Diag Fac Amounts	1,479	1,781	2,561	2,669	4,680	4,594
Hospital Costs	1,239	1,105	4,772	4,195	16,800	14,711
Pharmacy Costs	1,317	1,354	1,640	1,669	1,987	2,020
Total Cost	4,035	4,240	8,973	8,533	23,467	21,324
Attachment to Practice	84	88	79	83	71	76

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

Table 35: Average Annual Costs for Congestive Heart Failure Adjusted for Differences in RUB, Gender, and Age Group for April 2009 to March 2010

	Heart Failure Incentive	
	No Incentive	Incentive
GP Amount	923	1,171
Specialist Amount	1,005	862
Diag Fac Amount	719	755
GP Specialist and Diag Fac Amounts	2,647	2,789
Hospital Costs	6,389	5,608
Pharmacy Costs	1,592	1,624
Total Cost	10,627	10,021
Attachment to Practice	79	83

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

Table 36: Average Annual Costs for Hypertension within RUB Adjusted for Differences in Gender and Age Group Distributions for April 2009 to March 2010

	Resource Utilization Band					
	3		4		5	
	Hypertension Incentive		Hypertension Incentive		Hypertension Incentive	
	No	Yes	No	Yes	No	Yes
GP Amount	377	409	657	706	1,034	1,037
Specialist Amount	279	239	753	682	1,575	1,380
Diag Fac Amount	299	277	567	538	812	768
GP Specialist and Diag Fac Amounts	955	925	1,977	1,925	3,420	3,185
Hospital Costs	613	457	2,808	2,281	9,893	7,860
Pharmacy Costs	378	358	799	797	1,196	1,093
Total Cost	1,945	1,740	5,583	5,003	14,509	12,138
Attachment to Practice	80	85	77	80	72	76

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

Table 37: Average Annual Costs for Hypertension Adjusted for Differences in RUB, Gender, and Age Group for April 2009 to March 2010

	Hypertension Incentive	
	No	Yes
GP Amount	475	507
Specialist Amount	458	401
Diag Fac Amount	383	359
GP Specialist and Diag Fac Amounts	1,316	1,267
Hospital Costs	1,682	1,323
Pharmacy Costs	512	489
Total Cost	3,509	3,079
Attachment to Practice	79	83

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

Table 38: Average Annual Costs for Diabetes Adjusted for Differences in Gender and Age Distributions by Attachment Level and RUB: April 2009 to March 2010

Average Total Costs				Resource Utilization Band		
				3	4	5
Diabetes Incentive	Attachment to Practice					
	No Incentive	1. Less than 40%				
		2. 40% - 59%				
		3. 60% - 79%				
		4. 80% - 89%				
		5. 90% or More				
Incentive	1. Less than 40%					
	2. 40% - 59%					
	3. 60% - 79%					
	4. 80% - 89%					
	5. 90% or More					

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

Table 39: Average Annual Costs for Diabetes Adjusted for Differences in Gender, Age and RUB by Attachment Level: April 2009 to March 2010

Average Total Costs			Diabetes Incentive	
			No Incentive	Incentive
Attachment to Practice				
1. Less than 40%			12,772	13,888
2. 40% - 59%			8,208	8,302
3. 60% - 79%			6,404	6,352
4. 80% - 89%			4,644	4,681
5. 90% or More			3,231	3,444

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

Table 40: Average Annual Costs for Diabetes Adjusted for Differences in Gender, Age, RUB and Attachment Level Distributions: April 2009 to March 2010

	Diabetes Incentive	
	No Incentive	Incentive
GP Amount	567	749
Specialist Amount	591	560
Diag Fac Amount	472	476
GP Specialist and Diag Fac Amounts	1,631	1,785
Hospital Costs	2,410	2,213
Pharmacy Costs	1,000	1,181
Average Total Cost	5,041	5,179

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

Table 41: Average Annual Costs for Congestive Heart Failure Adjusted for Differences in Gender and Age Distributions by Attachment Level and RUB: April 2009 to March 2010

Average Total Costs				Resource Utilization Band		
				3	4	5
Heart Failure Incentive	Attachment to Practice					
No Incentive	1. Less than 60%			5,597	13,499	31,279
	2. 60% - 79%			4,790	10,475	24,249
	3. 80% - 89%			4,067	8,339	20,613
	4. 90% or More			3,372	6,115	13,848
Incentive	1. Less than 60%			6,740	13,207	33,043
	2. 60% - 79%			5,249	10,529	23,432
	3. 80% - 89%			4,463	8,894	17,511
	4. 90% or More			3,644	6,284	12,904

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

Table 42: Average Annual Costs for Congestive Heart Failure Adjusted for Differences in Gender, Age and RUB by Attachment Level: April 2009 to March 2010

Average Total Costs				Heart Failure Incentive	
				No Incentive	Incentive
Attachment to Practice					
1. Less than 60%				19,098	20,083
2. 60% - 79%				13,117	13,019
3. 80% - 89%				9,558	9,133
4. 90% or More				5,802	5,856

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

Table 43: Average Annual Costs for Diabetes Adjusted for Differences in Gender, Age, RUB and Attachment Level Distributions: April 2009 to March 2010

	Heart Failure Incentive	
	No Incentive	Incentive
GP Amount	917	1,198
Specialist Amount	994	902
Diag Fac Amount	718	758
GP Specialist and Diag Fac Amounts	2,629	2,858
Hospital Costs	6,261	6,090
Pharmacy Costs	1,592	1,633
Average Total Cost	10,482	10,581

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

Table 44: Average Annual Costs for Hypertension Adjusted for Differences in Gender and Age Distributions by Attachment Level and RUB: April 2009 to March 2010

Average Total Costs				Resource Utilization Band		
				3	4	5
Hypertension Incentive No Incentive	Attachment to Practice					
	1. Less than 40%			2,925	8,338	22,331
	2. 40% - 59%			2,378	7,019	18,156
	3. 60% - 79%			2,136	6,337	15,785
	4. 80% - 89%			1,859	5,280	12,815
	5. 90% or More			1,654	4,029	8,539
Incentive	1. Less than 40%			2,812	7,767	22,504
	2. 40% - 59%			2,187	6,944	16,963
	3. 60% - 79%			2,002	5,753	13,611
	4. 80% - 89%			1,719	4,767	10,863
	5. 90% or More			1,541	3,851	7,540

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

Table 45: Average Annual Costs for Hypertension Adjusted for Differences in Gender, Age and RUB by Attachment Level: April 2009 to March 2010

Average Total Costs			Hypertension Incentive	
			No Incentive	Incentive
Attachment to Practice				
1. Less than 40%			7,363	7,183
2. 40% - 59%			5,091	4,813
3. 60% - 79%			4,274	3,856
4. 80% - 89%			3,203	2,873
5. 90% or More			2,338	2,174

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

Table 46: Average Annual Costs for Hypertension Adjusted for Differences in Gender, Age, RUB and Attachment Level Distributions: April 2009 to March 2010

	Hypertension Incentive	
	No Incentive	Incentive
GP Amount	470	514
Specialist Amount	451	409
Diag Fac Amount	383	360
GP Specialist and Diag Fac Amounts	1,304	1,284
Hospital Costs	1,619	1,400
Pharmacy Costs	514	487
Average Total Cost	3,436	3,170

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

Table 47: Average Annual Total Adjusted and Unadjusted Costs for Patients who did, and did not, Receive Incentives Based Care: Fiscal 2009/10

	No Incentives (\$)	Incentives (\$)
<u>Diabetes</u>		
Raw (Unadjusted Costs)	5,381	4,947
Costs Adjusted for Gender, Age and RUB	5,171	5,060
Costs Adjusted for Gender, Age, RUB and Attachment level	5,041	5,179
<u>Chf</u>		
Raw (Unadjusted Costs)	10,635	10,011
Costs Adjusted for Gender, Age and RUB	10,627	10,021
Costs Adjusted for Gender, Age, RUB and Attachment level	10,482	10,581
<u>Hypertension</u>		
Raw (Unadjusted Costs)	3,628	2,970
Costs Adjusted for Gender, Age and RUB	3,509	3,079
Costs Adjusted for Gender, Age, RUB and Attachment level	3,436	3,170

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

5. DISCUSSION

While the pattern for fiscal 2009/10 of having lower standardized costs for people who received incentive based care was maintained for hypertension, it was reversed for diabetes and chf. There are several possible reasons for this. There were some adjustments in the formula for determining who is on the chf registry. However, adjustments to registries are only likely to have had a modest effect.

When we initially started doing these reports, we included people who were on registries and those not on a registry who had received incentive based care as we argued that if a GP provided incentive based care their patient would indeed have the condition in question. We then found in the complex care analysis that the results were quite different if one only considers people on registries or people on registries plus people not on registries who receive incentive based care. Initially, there appeared to be very few people in this second group for the three CDM conditions so we continued to use a base of people on registries and people not on registries who had received incentive based care. Given the consistent pattern of findings for complex care, over time, we realized that we did not have an appropriate comparison group for people who were not on registries but had received incentive based care in the “no incentives” group. Thus, for fiscal 2009/10, we limited the analyses to people on the registries. We initially thought we had made an error and underestimated the impact of the group of people who were not on registries but who had received incentive based care. We thought the reversal in findings was due to the change of only including people on the registries in the analysis. However, this may only be a partial cause of the difference for fiscal 2009/10. We know this because when we did the multi-year extracts we only did them for people on the registries. What we found was that, for fiscal 2008/09, the previous pattern of lower costs for people who received incentive based care still pertained (although the cost differential was reduced). Tables 48 to 50 show the

data for 2008/09 (with and without the group of people who were not on registries but who received incentive based care for the three CDM conditions) and fiscal 2009/10.

We have also produced a report on health indicators. In this report it appears that higher proportions of people who received incentive based care lived longer. Thus, another possibility is that people were kept alive longer due to the use of incentives but that this effect has run its course and now some of the people are dying or have become more complex (i.e., moved from a low RUB 4 to a high RUB 4). While we excluded people who died from our analysis, health costs began to escalate three to six months prior to death and some of these costs could have been included in fiscal 2009/10 data. This is simply one of a potential number of hypotheses which could explain this difference and more research is clearly required.

We investigated further, and while the above may have been factors, another potential reason occurred. There were a number of changes for fiscal 2009/10 in terms of how RUBs were calculated (there was a switch to using BC data in calculating the RUBs, rather than using metrics from John Hopkins University) and registries were structured. However, it appears that one possible reason for the difference in results for fiscal 2009/10 was that people who privately paid for insulin were added to the registries. This would have been a lower cost group. It was also clear that the main cost difference between fiscal 08/09 and 09/10 was for RUB 5 patients with patients not receiving incentive based care costing less due to reduced hospital costs. Thus, even a modest addition of new RUB 5 patients who had previously not been on the registry because they paid for insulin privately could have affected the results for fiscal 09/10.

In looking at the data in Tables 48 and 49 it is clear that whatever the cause it resulted in narrowing the cost gap for hospital care between people who did, and did not receive incentives. This increased the cost for people who received incentive based care to the point that their costs were higher than for patients who had not received incentive based care.

Finally we conducted a new analysis for this report where we looked at the net economic benefit of providing incentive based care. Given the different finding for fiscal 2009/10, we did this analysis, for people on registries only, for both fiscal 2008/09 and 2009/10. In the data tables 51 to 53, the costs/savings of incentive based care are not additive as people with diabetes and chf can also have other CDM conditions. However, the cost avoidance noted for hypertension can stand alone as it is based on people who only had billings for hypertension. In the following tables we note: the number of people on the registry, the number of people who received incentive based care who were in our analysis, the total cost avoidance (we net out the cost of the incentive plus the difference between those who did and did not receive incentive based care, standardized for age, sex, RUB and attachment level), the cost of incentives for everyone in BC, the cost avoidance obtained through incentives and the net cost/savings for the conditions analysed.

As can be seen for fiscal 2008/09, there was considerable cost avoidance, even if one only considers hypertension. For 2009/10 the savings from incentive based care were minimal or non-existent. Nevertheless, even if one combines the additional costs for diabetes and chf, these costs would be at least offset by the savings/cost avoidance for hypertension of \$41.5 million.

Table 48: Comparison of Standardized Costs for Diabetes

	Original 08/09 Data		Registries Only 08/09 Data		Registries Only 09/10 Data	
	Diabetes Incentive		Diabetes Incentive		Diabetes Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	550	719	545	717	567	749
Specialist Amount	586	544	583	542	591	560
Diag Fac Amount	467	469	470	470	472	476
GP Specialist and Diag Fac Amounts	1,603	1,731	1,598	1,730	1,631	1,785
Hospital Costs	2,166	1,844	2,547	2,221	2,410	2,213
Pharmacy Costs	1,036	1,193	1,023	1,208	1,000	1,181
Average Total Cost	4,806	4,768	5,168	5,159	5,041	5,179

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

Table 49: Comparison of Standardized Costs for Congestive Heart Failure

	Original 08/09 Data		Registries Only 08/09 Data		Registries Only 09/10 Data	
	CHF Incentive		CHF Incentive		CHF Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	858	1,109	857	1,130	917	1,198
Specialist Amount	939	829	965	877	994	902
Diag Fac Amount	693	722	714	760	718	758
GP Specialist and Diag Fac Amounts	2,490	2,660	2,536	2,766	2,629	2,858
Hospital Costs	5,287	4,581	6,377	5,972	6,261	6,090
Pharmacy Costs	1,580	1,589	1,623	1,675	1,592	1,633
Average Total Cost	9,358	8,829	10,536	10,413	10,482	10,581

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

Table 50: Comparison of Standardized Costs for Hypertension

	Original 08/09 Data		Registries Only 08/09 Data		Registries Only 09/10 Data	
	Hypertension Incentive		Hypertension Incentive		Hypertension Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	445	489	443	487	470	514
Specialist Amount	442	404	437	399	451	409
Diag Fac Amount	377	356	377	354	383	360
GP Specialist and Diag Fac Amounts	1,264	1,249	1,256	1,241	1,304	1,284
Hospital Costs	1,361	1,169	1,617	1,415	1,619	1,400
Pharmacy Costs	526	487	518	484	514	487
Average Total Cost	3,152	2,904	3,391	3,140	3,436	3,170

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

Table 51: Summary of Diabetes Incentive Costs Based on 125 Per Incentive

	Fiscal 2008/09	Fiscal 2009/10
Total on Registry	296,079	317,464
On Registry, Incentive, Included	118,163	126,264
Incentive Amount Total Patients with Incentives	19,336,875	20,104,500
Total Cost Per Person With Incentives	5,159	5,179
Total Cost Per Person With Incentives Excluding Incentive Amount(\$125)	5,034	5,054
Total Cost Per Person Without Incentives	5,168	5,041
Savings/Cost Per Person With Incentives Excluding Incentive Amount	134	-13
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	15,842,116	-1,645,785
Cost of Incentives	-19,336,875	-20,104,500
Total Dollar Savings/Cost	-3,494,759	-21,750,285

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

Table 52: Summary of Congestive Heart Failure Incentive Costs Based on 125 Per Incentive

	Fiscal 2008/09	Fiscal 2009/10
Total on Registry	82,270	85,095
On Registry, Incentive, Included	13,367	14,486
Incentive Amount Total Patients with Incentives	2,437,625	2,510,250
Total Cost Per Person With Incentives	10,413	10,581
Total Cost Per Person With Incentives Excluding Incentive Amount(\$125)	10,288	10,456
Total Cost Per Person Without Incentives	10,536	10,482
Savings/Cost Per Person With Incentives Excluding Incentive Amount	249	26
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	3,324,580	379,957
Cost of Incentives	-2,437,625	-2,510,250
Total Dollar Savings/Cost	886,955	-2,130,293

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

Table 53: Summary of Hypertension Incentive Costs Based on 50 Per Incentive

	Fiscal 2008/09	Fiscal 2009/10
Total on Registry	528,215	542,649
On Registry, Incentive, Included	161,608	166,465
Incentive Amount Total Patients with Incentives	10,929,550	11,014,550
Total Cost Per Person With Incentives	3,140	3,170
Total Cost Per Person With Incentives Excluding Incentive Amount(\$50)	3,090	3,120
Total Cost Per Person Without Incentives	3,391	3,436
Savings/Cost Per Person With Incentives Excluding Incentive Amount	301	316
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	48,705,513	52,589,090
Cost of Incentives	-10,929,550	-11,014,550
Total Dollar Savings/Cost	37,775,963	41,574,540

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

In conducting our various investigations it also became clear that the number of registries a patient was on was, for most conditions, related to cost. Thus, we have added an additional possible variable to our costing adjustments, that is, the number of registries a patient is on (based on the complex care and CDM registries). This had an effect on the adjusted costs for diabetes and chf but not for hypertension as there was little difference in costs in regard to the number of registries a patient was on for hypertension.

Tables 54 and 55 present the comparative costs, and provincial cost avoidance, adjusting for RUB, age, sex, attachment level and number of registries. Comparable data are presented for chf and hypertension in Tables 56 and 57, and 58 and 59.

Table 54: Standardized Rates for Diabetes RUB, Attachment, Gender, and Age Group and Number of Registries: Fiscal 2009/10

	Diabetes Incentive	
	No Incentive	Incentive
GP Amount	567	749
Specialist Amount	592	557
Diag Fac Amount	472	476
GP Specialist and Diag Fac Amounts	1,631	1,783
Hospital Costs	2,420	2,197
Pharmacy Costs	1,000	1,180
Average Total Cost	5,051	5,160

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

Table 55: Summary of Diabetes Incentive Costs Based on \$125 per Incentive Adjusted Rates Including the Number of Registries: Fiscal 2009/10

Patients on Registry or with Incentives	321,912
Total on Registry	317,464
Not On Registry, Incentive, Excluded	4,448
On Registry, Incentive, Excluded	30,124
On Registry, No Incentive, Excluded	57,518
On Registry, Incentive, Included	126,264
On Registry, No Incentive, Included	103,558
Total Patients with Incentives	160,836
Incentive Amount Not On Registry, Incentive, Excluded	556,000
Incentive Amount Patients On Registry, Incentive, Excluded	3,765,500
Incentive Amount On Registry, Incentive, Included	15,783,000
Incentive Amount Total Patients with Incentives	20,104,500
Total Cost Per Person With Incentives	5,160
Total Cost Per Person With Incentives Excluding Incentive Amount(\$125)	5,035
Total Cost Per Person Without Incentives	5,051
Savings/Cost Per Person With Incentives Excluding Incentive Amount	16
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	1,995,596
Cost of Incentives	-20,104,500
Total Dollar Savings/Cost	-18,108,904

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

Table 56: Standardized Rates for Congestive Heart Failure RUB, Attachment, Gender, and Age Group and Number of Registries: Fiscal 2009/10

	Heart Failure Incentive	
	No Incentive	Incentive
GP Amount	916	1,199
Specialist Amount	994	906
Diag Fac Amount	718	759
GP Specialist and Diag Fac Amounts	2,629	2,863
Hospital Costs	6,261	6,116
Pharmacy Costs	1,590	1,632
Average Total Cost	10,481	10,611

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

Table 57: Summary of Congestive Heart Failure Incentive Costs Based on \$125 per Incentive Adjusted Rates Including the Number of Registries: Fiscal 2009/10

Patients on Registry or with Incentives	88,233
Total on Registry	85,095
Not On Registry, Incentive, Excluded	3,138
On Registry, Incentive, Excluded	2,458
On Registry, No Incentive, Excluded	20,159
On Registry, Incentive, Included	14,486
On Registry, No Incentive, Included	47,992
Total Patients with Incentives	20,082
Incentive Amount Not On Registry, Incentive, Excluded	392,250
Incentive Amount Patients On Registry, Incentive, Excluded	307,250
Incentive Amount On Registry, Incentive, Included	1,810,750
Incentive Amount Total Patients with Incentives	2,510,250
Total Cost Per Person With Incentives	10,611
Total Cost Per Person With Incentives Excluding Incentive Amount(\$125)	10,486
Total Cost Per Person Without Incentives	10,481
Savings/Cost Per Person With Incentives Excluding Incentive Amount	-5
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	-79,502
Cost of Incentives	-2,510,250
Total Dollar Savings/Cost	-2,589,752

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

Table 58: Standardized Rates for Hypertension Gender, and Age Group and Attachment, and No of Registries within RUB: Fiscal 2009/10

	Hypertension Incentive	
	No Incentive	Incentive
GP Amount	470	515
Specialist Amount	451	409
Diag Fac Amount	382	361
GP Specialist and Diag Fac Amounts	1,303	1,285
Hospital Costs	1,619	1,400
Pharmacy Costs	512	490
Average Total Cost	3,433	3,175

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

Table 59: Summary of Hypertension Incentive Costs Based on \$50 per Incentive: Fiscal 2009/19

Patients on Registry or with Incentives	547,570
Total on Registry	542,649
Dropped, Incentive, Diabetes or CHF	28,435
Dropped, No Incentive, Diabetes or CHF	229,989
Not On Registry, Incentive, Excluded	4,921
On Registry, Incentive, Excluded	48,905
On Registry, No Incentive, Excluded	133,378
On Registry, Incentive, Included	166,465
On Registry, No Incentive, Included	193,901
Total Patients with Incentives	220,291
Incentive Amount Not On Registry, Incentive, Excluded	246,050
Incentive Amount Patients On Registry, Incentive, Excluded	2,445,250
Incentive Amount On Registry, Incentive, Included	8,323,250
Incentive Amount Total Patients with Incentives	11,014,550
Total Cost Per Person With Incentives	3,175
Total Cost Per Person With Incentives Excluding Incentive Amount(\$50)	3,125
Total Cost Per Person Without Incentives	3,433
Savings/Cost Per Person With Incentives Excluding Incentive Amount	309
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	51,373,165
Cost of Incentives	-11,014,550
Total Dollar Savings/Cost	40,358,615

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

Using all adjustments including the number of registries, the net cost avoidance across the three conditions is \$19,659,959. This is a conservative estimate. The cost avoidance would be considerably higher if one only adjusted for age, sex and RUB. Attachment is not a true independent variable. It is also impacted by the use of incentives such that GPs who are high users of incentives also have higher attachment levels. The relative weight of attachment versus the use of incentives should be determined, and will be analyzed in the near future. We shall also study whether or not registries are a relevant independent variable or whether their effects are mostly covered by RUBs, as both are variables related to higher costs.

The following table shows estimated cost avoidance when one only adjusts for age, sex and RUB. These are maximum numbers. We expect that the actual cost avoidance will be

between these numbers and the numbers noted above where adjustments have been made for attachment levels.

	Diabetes	CHF	Hypertension
Cost Avoidance from Incentive Based Care	\$42,424,704	\$10,589,266	\$79,903,200
Cost of Incentives	\$20,104,500	\$2,510,250	-\$11,014,550
Net Cost Avoidance	\$22,320,204	\$8,079,016	\$68,888,650