

The General Practice Services Committee

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

Final Report: Evaluation of Diabetes Payment Incentives to March 31, 2011

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HIGHLIGHTS OF FINDINGS

- In terms of unadjusted costs, the average, annual costs for patients who did, and did not, receive incentive based care were \$4,873 and \$5,225 respectively. When one adjusts for the impacts of age, gender and RUB distributions, the costs were \$4,993 and \$5,059 respectively.
- When we adjust for age, gender, RUB and attachment level, however, costs were higher for patients who received incentive based care compared to those who did not, i.e., \$5,091 compared to \$4,943. This meant that for diabetes the use of incentives was not cost-effective. Overall there was a negative cost avoidance of some \$24.7 million. However, the opposite is true for chf, COPD and hypertension, so, overall, it appears that incentive based care is cost-effective for the four chronic diseases for which there are incentives.
- Patients who received incentive based care typically had about one more A1C test per year than patients who did not, across time and RUB level.
- In terms of hospital utilization, patients who received incentive based care had fewer days in hospital per 1,000 patients both across time and care levels.
- Similarly, there were fewer readmissions per 1,000 admissions for patients who received incentive based care.
- Finally, for patients who received incentive based care, the length of time spent in hospital per admission was less than for patients who did not receive incentive based care.
- The above results, unlike the results for costs, were maintained when one adjusted for differences in age, gender, RUB and attachment level.
- The adjusted cost differential between patients who did, and did not, receive incentive based care were very similar when we analyzed data for all diabetes patients versus patients who only had diabetes. Thus, the analysis of all diabetes patients, including those who received incentive payments for other chronic conditions, still appears to be relatively robust.

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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 the Diabetes Incentive to March 31, 2011.

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.

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 BC Ministry of Health.

¹Schoenbach, 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.

2. METHODS

In order to derive a group of patients who were comparable, and may or may not have received incentive based care, and to exclude extreme outliers, 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 estimated to be in a long term care facility during the 2010/11 fiscal year.

The overall findings seem to indicate that the use of incentives appears to increase costs for people with low to moderate care needs (i.e., RUB 3). The pattern, however, seems to change for RUBs 4 and 5. This change appears to be the result of people having higher care needs and greater hospital costs.

3. SERVICES, RUBS AND SAMPLE SELECTION

The GPSC expressed an interest in obtaining more information about services and RUB levels. In fiscal 2010/11, there were 310 patients on the diabetes registry who had no services. For RUBs, RUB 0 (zero) is a holding category for patients who could not be placed in RUBs 1 to 5. There were 3,068 patients at RUB 0. The following tables exclude patients at RUB 0 and patients with no services in the fiscal year.

Table 1 presents detailed information on the number of patients who received at least one service and were at least at RUB 1. As can be seen in Table 1, there were relatively few patients who received incentive based care both in absolute numbers, and in relation to the number of people who did not receive incentive based care, for people who had one to four services. Our selected sample is in the shaded area in Table 1. Tables 1 and 2 also include comparative, raw, or unadjusted, cost data for patients who did, and did not, receive incentive based care. Table 3 shows the number of patients at each intersection between the number of services and RUB levels. There is clearly a direct relationship between RUB level and the number of services. Table 3 shows that more people with low number of services were at low RUB levels and more people with high numbers of services were at higher RUB levels.

It should be noted that Tables 1 to 3 refer to our initial selection of patients. Once the patients were selected we applied some of our screens (excluding RUB levels and the number of services) (see Methods section). Once the screens were applied, the number of people in the analysis dropped from 331,795 to 313,992, Table 4 presents data on the patients in our analysis. After we applied the RUB and services screens 238,702 patients remained in our analysis. As can be seen in Tables 2 and 4, costs increase the more services one has and the higher the RUB level. Table 4 indicates unadjusted annual costs at \$5,225 for patients who did not have an incentive compared to \$4,873 for patients who did receive incentive based care. Tables 5 to 8 show the comparative, unadjusted costs for people who did, and did not, receive incentive based care in fiscal 10/11, overall and by RUB level. These Tables also show cost breakdowns over time.

It is interesting to note that total, annual, raw costs, remained relatively constant over time for RUB 3 patients for those who did, and did not, receive incentive based care, while costs decreased over time, for both groups, for RUBs 4 and 5.

Table 1: Patients with Diabetes for RUBs 1 to 5 and at Least One GP Service (April 2010 to March 2011)

Diabetes			Number of Patients with Related Incentive		% of Patients with Related Incentive By Services		Average Total Cost		% of Patients with Related Incentive Within Service Group
	Number Of Patients	% of Patients	No	Yes	No	Yes	No	Yes	
All	331,795	100.0	163,954	167,841	100.0	100.0	5,528	4,898	50.6
GP Services									
01	9,268	2.8	8,249	1,019	5.0	0.6	1,353	1,164	11.0
02	12,462	3.8	9,972	2,490	6.1	1.5	1,450	986	20.0
03	16,895	5.1	11,447	5,448	7.0	3.2	1,597	1,253	32.2
04	21,128	6.4	12,488	8,640	7.6	5.1	1,668	1,244	40.9
05	25,009	7.5	12,716	12,293	7.8	7.3	1,939	1,471	49.2
06	25,633	7.7	11,966	13,667	7.3	8.1	2,152	1,737	53.3
07	24,715	7.4	10,986	13,729	6.7	8.2	2,411	1,958	55.5
08	22,711	6.8	9,771	12,940	6.0	7.7	2,703	2,312	57.0
09	20,341	6.1	8,479	11,862	5.2	7.1	3,047	2,577	58.3
10-14	68,081	20.5	28,425	39,656	17.3	23.6	4,150	3,576	58.2
15-19	33,070	10.0	14,141	18,929	8.6	11.3	6,409	5,637	57.2
20 or More	52,482	15.8	25,314	27,168	15.4	16.2	19,906	15,573	51.8
Resource Utilization Band									
1	2,471	0.7	2,471	.	1.5	.	294	.	0.0
2	40,544	12.2	21,735	18,809	13.3	11.2	639	863	46.4
3	200,004	60.3	95,047	104,957	58.0	62.5	2,187	2,482	52.5
4	53,713	16.2	26,117	27,596	15.9	16.4	6,927	6,582	51.4
5	35,063	10.6	18,584	16,479	11.3	9.8	27,062	22,066	47.0

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 2: Patients with Diabetes for RUBs 1 to 5 and at Least One GP Service (April 2010 to March 2011)

Diabetes	Number of Patients	% of Patients	Number of Patients with Related Incentive		% of Patients with Related Incentive By Services		Average Total Cost		% of Patients with Related Incentive Within Service Group
			No	Yes	No	Yes	No	Yes	
All	331,795	100.0	163,954	167,841	100.0	100.0	5,528	4,898	50.6
1. Rub 1 or 2 with Less than 5 GP services	25,453	7.7	17,659	7,794	10.8	4.6	489	639	30.6
2. Rub 1 or 2 with 5 or More GP services	17,562	5.3	6,547	11,015	4.0	6.6	916	1,021	62.7
3. Rub 3,4,5 with Less than 5 GP services	34,300	10.3	24,497	9,803	14.9	5.8	2,290	1,656	28.6
4. Rub 3,4,5 with 5 or More GP services	254,480	76.7	115,251	139,229	70.3	83.0	7,251	5,671	54.7

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 3: Patients with Diabetes for RUBs 1 to 5 and at Least One GP Service (April 2010 to March 2011)

	Number of Patients	Number of Patients					% of Patients				
		Resource Utilization Band					Resource Utilization Band				
Diabetes		1	2	3	4	5	1	2	3	4	5
All	331,795	2,471	40,544	200,004	53,713	35,063	100.0	100.0	100.0	100.0	100.0
GP Services											
01	9,268	1,473	5,059	2,465	196	75	59.6	12.5	1.2	0.4	0.2
02	12,462	524	5,773	5,737	319	109	21.2	14.2	2.9	0.6	0.3
03	16,895	221	6,188	9,733	577	176	8.9	15.3	4.9	1.1	0.5
04	21,128	110	6,105	13,763	915	235	4.5	15.1	6.9	1.7	0.7
05	25,009	54	5,743	17,529	1,386	297	2.2	14.2	8.8	2.6	0.8
06	25,633	26	4,128	19,166	1,863	450	1.1	10.2	9.6	3.5	1.3
07	24,715	20	2,795	18,974	2,380	546	0.8	6.9	9.5	4.4	1.6
08	22,711	11	1,764	17,533	2,729	674	0.4	4.4	8.8	5.1	1.9
09	20,341	8	1,103	15,517	2,902	811	0.3	2.7	7.8	5.4	2.3
10-14	68,081	13	1,590	47,581	13,953	4,944	0.5	3.9	23.8	26.0	14.1
15-19	33,070	<5	187	17,848	9,830	5,201	0.2	0.5	8.9	18.3	14.8
20 or More	52,482	7	109	14,158	16,663	21,545	0.3	0.3	7.1	31.0	61.4

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 4: Screened Patients with Diabetes by Services, RUBs and Costs (April 2010 to March 2011)

Diabetes	Number of Patients	% of Patients	Number of Patients with Related Incentive		% of Patients with Related Incentive By Services		Average Total Cost		% of Patients with Related Incentive Within Service Group
			No	Yes	No	Yes	No	Yes	
			All	313,992	100.0	150,920	163,072	100.0	
1. Rub 1 or 2 with Less than 5 GP services	25,013	8.0	17,263	7,750	11.4	4.8	481	634	31.0
2. Rub 1 or 2 with 5 or More GP services	17,249	5.5	6,273	10,976	4.2	6.7	894	1,018	63.6
3. Rub 3,4,5 with Less than 5 GP services	33,028	10.5	23,347	9,681	15.5	5.9	1,786	1,519	29.3
4. Rub 3,4,5 with 5 or More GP services	238,702	76.0	104,037	134,665	68.9	82.6	5,225	4,873	56.4

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

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

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	470	467	480	581	553	574	588
	Specialist Amount	524	549	571	595	608	621	645
	Diag Fac Amount	462	464	473	457	475	477	476
	GP Specialist and Diag Fac Amounts	1,456	1,480	1,524	1,633	1,636	1,672	1,708
	Pharmacy Costs	1,014	1,042	1,056	1,037	1,022	998	979
	Hospital Costs	2,583	2,683	2,602	2,627	2,618	2,474	2,538
	Total Costs	5,053	5,205	5,182	5,297	5,276	5,143	5,225
Patients		100768	96,953	93,442	87,772	91,731	102939	104037

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	518	511	566	776	704	734	750
	Specialist Amount	451	477	493	502	519	537	560
	Diag Fac Amount	470	469	471	450	466	471	470
	GP Specialist and Diag Fac Amounts	1,439	1,457	1,529	1,729	1,689	1,741	1,780
	Pharmacy Costs	1,120	1,161	1,187	1,179	1,190	1,164	1,128
	Hospital Costs	1,892	1,928	1,949	1,916	1,944	1,910	1,965
	Total Costs	4,450	4,546	4,665	4,824	4,823	4,816	4,873
Patients		51,598	70,302	86,220	109769	117880	125739	134665

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 6: Average Annual Cost Summaries by Year for All Patients with Diabetes for RUB 3

Resource Utilization Band 3

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	358	352	361	422	408	418	424
	Specialist Amount	271	278	289	289	302	305	320
	Diag Fac Amount	341	339	347	325	341	340	339
	GP Specialist and Diag Fac Amounts	970	969	997	1,036	1,050	1,063	1,083
	Pharmacy Costs	794	804	807	753	745	720	700
	Hospital Costs	666	674	644	582	609	566	568
	Total Costs	2,431	2,447	2,447	2,371	2,404	2,349	2,351
Patients		72,436	68,772	65,799	59,560	62,577	69,941	69,708

Resource Utilization Band 3

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	426	419	470	613	566	585	593
	Specialist Amount	256	276	281	270	280	287	297
	Diag Fac Amount	368	367	369	339	352	354	350
	GP Specialist and Diag Fac Amounts	1,051	1,062	1,120	1,222	1,198	1,227	1,240
	Pharmacy Costs	927	940	969	917	926	906	869
	Hospital Costs	533	534	510	460	470	440	456
	Total Costs	2,511	2,536	2,599	2,599	2,594	2,573	2,565
Patients		39,414	53,133	65,176	77,859	84,214	89,177	94,403

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 7: Average Annual Cost Summaries by Year for All Patients with Diabetes for RUB 4

Resource Utilization Band 4

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	622	608	622	761	710	738	739
	Specialist Amount	760	784	813	816	838	858	858
	Diag Fac Amount	648	638	647	618	640	642	627
	GP Specialist and Diag Fac Amounts	2,030	2,030	2,083	2,195	2,189	2,238	2,224
	Pharmacy Costs	1,378	1,404	1,435	1,414	1,394	1,377	1,321
	Hospital Costs	3,728	3,681	3,540	3,259	3,194	3,016	2,896
	Total Costs	7,136	7,114	7,058	6,868	6,777	6,632	6,441
Patients		18,627	18,244	17,954	18,206	18,905	21,311	21,775

Resource Utilization Band 4

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	698	678	729	1,021	902	938	953
	Specialist Amount	738	752	797	724	745	773	782
	Diag Fac Amount	698	671	677	615	639	644	637
	GP Specialist and Diag Fac Amounts	2,135	2,101	2,203	2,360	2,285	2,355	2,373
	Pharmacy Costs	1,562	1,640	1,651	1,626	1,636	1,604	1,535
	Hospital Costs	3,298	3,308	3,264	2,537	2,570	2,529	2,443
	Total Costs	6,995	7,049	7,117	6,524	6,492	6,489	6,351
Patients		8,262	11,582	13,964	21,002	22,035	23,948	26,208

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 8: Average Annual Cost Summaries by Year for All Patients with Diabetes for RUB 5

Resource Utilization Band 5

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	1,013	1,008	1,027	1,202	1,152	1,206	1,233
	Specialist Amount	1,955	1,991	2,038	2,013	2,052	2,075	2,078
	Diag Fac Amount	1,008	1,006	1,004	949	985	1,000	977
	GP Specialist and Diag Fac Amounts	3,976	4,005	4,070	4,164	4,189	4,281	4,288
	Pharmacy Costs	1,958	2,026	2,043	2,041	2,031	1,965	1,930
	Hospital Costs	14,690	14,761	14,167	13,650	13,822	12,906	12,853
	Total Costs	20,624	20,792	20,280	19,855	20,041	19,151	19,071
Patients		9,705	9,937	9,689	10,006	10,249	11,687	12,554

Resource Utilization Band 5

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Average	GP Amount	1,069	1,048	1,121	1,465	1,331	1,394	1,425
	Specialist Amount	1,798	1,815	1,844	1,732	1,819	1,852	1,912
	Diag Fac Amount	1,007	1,011	1,001	928	962	969	965
	GP Specialist and Diag Fac Amounts	3,875	3,874	3,965	4,125	4,112	4,215	4,302
	Pharmacy Costs	2,125	2,275	2,273	2,189	2,259	2,149	2,109
	Hospital Costs	12,584	12,322	12,606	11,121	11,432	11,130	11,209
	Total Costs	18,584	18,471	18,844	17,435	17,802	17,494	17,619
Patients		3,922	5,587	7,080	10,908	11,631	12,614	14,054

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

4. PATTERNS OF HOSPITAL UTILIZATION

Table 9 presents unadjusted data, for RUBs 3 to 5 for a number of hospital based indicators by year. As can be seen, patients who received incentive based care consistently had fewer hospital days per 1,000 patients.

As can be seen in Tables 9 to 12, patients who receive incentive based care consistently had fewer readmissions, overall, by RUB and by type of readmission (7, 15, or 30 day readmissions), per 1,000 admissions. There were, as expected, also significant increases in hospital days per 1,000 patients as one moved from RUB 3 to RUB 5. Finally, for “net” hospital admissions (admissions excluding transfers and day care) there was a consistent pattern, overall and by RUB level, in admissions over time from fiscal 2004/05 to fiscal 2010/11 such that patients who received incentive based care had fewer “net” admissions.

The next series of Tables (Tables 13 to 16) provide data on hospital lengths of stay for different definitions of admission. “Admissions” are all admissions less day care admissions. “Stays” are admissions less day care admissions and transfers. “Episodes” are admissions less day care and transfers, and less readmissions within 30 days. As can be seen from these tables, the average length of stay is shorter, overall and across RUB levels, for patients who received incentive based care.

Table 9a: Average Annual Service Summaries by Year for All Patients with Diabetes Who Did Not Receive Incentive Based Care for All RUBS

All RUBs *

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
GP Services	14.2	14.4	14.4	14.9	14.2	14.2	14.3	
Specialist Services	7.1	8.0	8.2	8.2	8.1	7.9	8.2	
Diag Fac Service	33.0	34.2	35.0	35.9	36.7	36.7	36.4	
GP Specialist and Diag Fac Services	54.4	56.6	57.6	59.0	59.0	58.8	58.9	
Hospital Days per 1000 Patients	2449.6	2486.6	2368.7	2358.2	2337.7	2188.0	2288.2	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	538.6	549.4	541.5	533.7	538.6	520.9	529.3	
Hospital Day Care Days per 1000 Patients	228.7	241.8	245.2	245.8	250.2	248.7	252.3	
Hospital Transfers per 1000 Patients	25.5	26.3	24.4	22.9	23.3	20.8	20.3	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	284.4	281.2	272.0	265.0	265.2	251.4	256.7	
Readmission Within 7 days per 1000 net Admissions	55.3	54.8	57.5	56.4	57.8	56.6	57.0	
Readmission Within 15 days per 1000 net Admissions	91.9	90.2	94.8	92.5	95.4	94.1	93.1	
Readmission Within 30 days per 1000 net Admissions	137.3	133.2	138.3	135.1	138.5	138.0	137.7	
Age	63.1	63.2	63.0	63.1	63.1	63.2	63.4	
Attachment to Practice	80.4	80.7	80.0	80.2	79.7	79.3	79.4	
Patients	100,768	96,953	93,442	87,772	91,731	102,939	104,037	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 9b: Average Annual Service Summaries by Year for All Patients with Diabetes Who Received Incentive Based Care

All RUBs *

Averages		Diabetes Incentive					
		Yes					
		Year					
		200405	200506	200607	200708	200809	200910
GP Services	14.4	14.4	14.2	15.7	14.2	14.4	14.3
Specialist Services	6.0	7.0	7.3	7.0	7.0	6.9	7.1
Diag Fac Service	34.9	36.0	36.3	37.5	38.4	38.3	38.3
GP Specialist and Diag Fac Services	55.3	57.3	57.8	60.1	59.6	59.6	59.7
Hospital Days per 1000 Patients	1706.5	1716.2	1725.1	1669.5	1687.2	1635.4	1690.6
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	452.5	456.7	455.3	441.0	447.6	447.4	456.0
Hospital Day Care Days per 1000 Patients	219.0	231.0	233.5	225.5	234.4	236.9	240.7
Hospital Transfers per 1000 Patients	16.0	15.2	15.9	15.2	15.8	15.2	14.8
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	217.4	210.5	205.9	200.3	197.4	195.3	200.5
Readmission Within 7 days per 1000 net Admissions	52.2	48.1	51.7	50.2	49.4	48.8	52.2
Readmission Within 15 days per 1000 net Admissions	86.9	79.7	79.8	80.7	80.8	80.2	84.3
Readmission Within 30 days per 1000 net Admissions	128.8	118.9	116.6	116.9	117.3	119.0	123.4
Age	64.6	64.5	64.9	64.9	65.2	65.4	65.6
Attachment to Practice	84.5	84.8	84.4	85.1	84.3	84.2	84.2
Patients	51,598	70,302	86,220	109,769	117,880	125,739	134,665

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 10a: Average Annual Service Summaries by Year for All Patients with Diabetes Who Did Not Receive Incentive Based Care: RUB 3

Resource Utilization Band 3

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
GP Services		11.2	11.2	11.2	11.3	10.9	10.8	10.8
Specialist Services		3.6	4.2	4.4	4.1	4.2	4.0	4.1
Diag Fac Service		25.9	26.3	27.2	27.4	28.4	28.0	27.9
GP Specialist and Diag Fac Services		40.7	41.7	42.8	42.8	43.5	42.8	42.7
Hospital Days per 1000 Patients		608.5	606.9	562.3	522.2	534.9	491.9	501.5
Hospital Admissions Incl Transfers and Day Care per 1000 Patients		250.3	250.7	244.7	232.0	241.1	236.5	236.4
Hospital Day Care Days per 1000 Patients		156.8	160.8	161.1	155.3	164.3	166.6	166.0
Hospital Transfers per 1000 Patients		3.3	3.5	2.7	2.2	2.7	1.6	1.8
Net Admissions per 1000 Patients (excluding Transfers and Day Care)		90.2	86.4	80.9	74.4	74.1	68.3	68.7
Readmission Within 7 days per 1000 net Admissions		23.1	21.4	25.0	22.6	23.7	24.7	22.1
Readmission Within 15 days per 1000 net Admissions		34.4	32.3	34.9	32.0	36.0	38.9	35.7
Readmission Within 30 days per 1000 net Admissions		50.6	47.0	49.2	48.0	49.6	52.3	50.1
Age		62.2	62.2	62.0	61.8	61.9	61.8	61.8
Attachment to Practice		82.5	82.8	82.2	82.3	82.0	81.6	81.8
Patients		72,436	68,772	65,799	59,560	62,577	69,941	69,708

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 10b: Average Annual Service Summaries by Year for All Patients with Diabetes Who Received Incentive Based Care: RUB 3

Resource Utilization Band 3

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
GP Services	11.8	11.8	11.6	12.3	11.3	11.4	11.2	
Specialist Services	3.3	4.2	4.4	3.9	4.0	3.8	3.8	
Diag Fac Service	29.2	30.0	30.3	30.6	31.4	31.2	30.9	
GP Specialist and Diag Fac Services	44.2	45.9	46.3	46.8	46.6	46.5	45.9	
Hospital Days per 1000 Patients	463.8	463.6	440.6	394.7	395.1	373.9	378.6	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	228.6	232.3	225.7	207.1	212.8	211.7	211.6	
Hospital Day Care Days per 1000 Patients	154.7	162.6	161.5	149.2	155.9	158.7	158.4	
Hospital Transfers per 1000 Patients	2.2	1.9	1.8	1.3	1.5	1.2	1.4	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	71.6	67.8	62.4	56.7	55.3	51.8	51.9	
Readmission Within 7 days per 1000 net Admissions	20.5	19.4	17.9	17.9	15.5	20.6	23.9	
Readmission Within 15 days per 1000 net Admissions	32.6	28.0	26.1	27.4	25.8	30.1	31.0	
Readmission Within 30 days per 1000 net Admissions	45.0	37.7	37.4	37.2	37.6	42.4	42.0	
Age	63.9	63.8	64.1	63.6	63.9	64.0	64.3	
Attachment to Practice	86.3	86.6	86.2	86.8	86.2	86.2	86.4	
Patients	39,414	53,133	65,176	77,859	84,214	89,177	94,403	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 11a: Average Annual Service Summaries by Year for All Patients with Diabetes Who Did Not Receive Incentive Based Care: RUB 4

Resource Utilization Band 4

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
GP Services	18.6	18.5	18.4	18.8	17.7	17.7	17.5	
Specialist Services	10.3	11.2	11.6	11.3	11.1	10.9	10.9	
Diag Fac Service	42.9	43.8	44.5	46.0	45.9	46.0	45.0	
GP Specialist and Diag Fac Services	71.8	73.5	74.6	76.1	74.7	74.6	73.3	
Hospital Days per 1000 Patients	3495.5	3363.6	3190.9	2913.9	2812.4	2584.3	2545.4	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	860.6	852.8	832.5	781.7	788.5	750.1	724.1	
Hospital Day Care Days per 1000 Patients	344.2	362.7	368.4	365.9	368.4	360.0	353.3	
Hospital Transfers per 1000 Patients	33.6	33.6	30.2	27.1	26.0	23.5	20.4	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	482.9	456.5	433.8	388.7	394.1	366.6	350.4	
Readmission Within 7 days per 1000 net Admissions	42.6	45.1	43.1	42.1	43.1	41.6	41.9	
Readmission Within 15 days per 1000 net Admissions	70.7	67.4	70.2	67.3	68.5	66.8	66.3	
Readmission Within 30 days per 1000 net Admissions	106.7	96.7	100.4	97.5	99.6	97.8	97.3	
Age	64.1	64.2	64.1	64.4	64.3	64.6	65.0	
Attachment to Practice	77.2	77.5	76.9	77.9	77.2	76.7	77.0	
Patients	18,627	18,244	17,954	18,206	18,905	21,311	21,775	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 11b: Average Annual Service Summaries by Year for All Patients with Diabetes Who Received Incentive Based Care: RUB 4

Resource Utilization Band 4

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
GP Services	19.7	19.4	18.9	20.3	18.0	18.2	18.1	
Specialist Services	9.8	10.7	11.5	9.9	10.1	10.0	9.9	
Diag Fac Service	47.3	47.2	47.3	47.3	48.7	48.1	47.8	
GP Specialist and Diag Fac Services	76.9	77.4	77.7	77.6	76.8	76.2	75.8	
Hospital Days per 1000 Patients	2924.2	2872.6	2786.7	2129.7	2177.9	2074.3	2000.3	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	817.6	804.9	804.9	670.0	686.1	680.9	669.9	
Hospital Day Care Days per 1000 Patients	366.5	378.9	391.2	346.4	358.3	362.2	361.5	
Hospital Transfers per 1000 Patients	27.8	24.3	24.8	18.3	17.2	17.7	14.9	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	423.3	401.7	388.9	305.3	310.6	301.0	293.5	
Readmission Within 7 days per 1000 net Admissions	36.9	31.4	37.4	35.6	40.5	32.7	36.5	
Readmission Within 15 days per 1000 net Admissions	59.2	53.9	57.1	55.7	61.2	53.8	58.9	
Readmission Within 30 days per 1000 net Admissions	86.4	85.8	83.4	80.0	85.1	79.1	83.9	
Age	66.2	65.9	66.4	67.5	67.5	67.8	67.9	
Attachment to Practice	80.6	81.2	80.7	83.3	81.9	81.8	81.8	
Patients	8,262	11,582	13,964	21,002	22,035	23,948	26,208	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 12a: Average Annual Service Summaries by Year for All Patients with Diabetes Who Did Not Receive Incentive Based Care: RUB 5

Resource Utilization Band 5

Averages		Diabetes Incentive					
		No					
		Year					
		200405	200506	200607	200708	200809	200910
GP Services	28.9	29.4	29.0	28.9	27.8	27.7	28.3
Specialist Services	27.6	28.7	28.0	26.9	26.5	26.2	26.1
Diag Fac Service	67.2	70.7	70.2	68.1	70.3	71.3	69.1
GP Specialist and Diag Fac Services	123.6	128.8	127.3	123.9	124.6	125.3	123.5
Hospital Days per 1000 Patients	14183.7	13885.5	13112.3	12275.9	12469.7	11615.7	11762.4
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	2071.8	2059.5	2018.3	1878.4	1894.3	1804.8	1817.9
Hospital Day Care Days per 1000 Patients	543.8	580.7	587.8	566.0	556.1	537.2	556.6
Hospital Transfers per 1000 Patients	175.9	171.1	161.0	137.9	144.3	130.6	123.3
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	1352.1	1307.7	1269.5	1174.5	1194.0	1137.1	1138.0
Readmission Within 7 days per 1000 net Admissions	80.1	76.3	80.7	77.7	79.6	76.9	76.7
Readmission Within 15 days per 1000 net Admissions	135.0	131.4	136.2	130.5	134.3	129.9	126.6
Readmission Within 30 days per 1000 net Admissions	201.5	196.1	200.8	190.5	196.0	192.5	188.7
Age	67.8	68.3	68.0	68.7	68.6	68.9	69.3
Attachment to Practice	71.0	71.5	70.8	71.8	70.9	70.4	70.6
Patients	9,705	9,937	9,689	10,006	10,249	11,687	12,554

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 12b: Average Annual Service Summaries by Year for All Patients with Diabetes Who Received Incentive Based Care: RUB 5

Resource Utilization Band 5

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
GP Services	29.1	29.5	29.1	30.3	27.8	27.9	28.5	
Specialist Services	24.8	25.8	25.3	23.1	23.5	23.2	23.9	
Diag Fac Service	66.8	69.7	69.4	68.1	69.7	69.7	69.9	
GP Specialist and Diag Fac Services	120.7	125.0	123.8	121.6	121.0	120.9	122.3	
Hospital Days per 1000 Patients	11629.8	11232.0	11455.8	9882.4	10113.0	9720.3	9926.2	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	1933.7	1869.9	1879.9	1669.1	1695.6	1670.4	1698.7	
Hospital Day Care Days per 1000 Patients	554.6	575.1	585.9	537.7	567.9	552.1	568.4	
Hospital Transfers per 1000 Patients	130.3	123.1	128.5	108.2	116.1	109.6	104.7	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	1248.9	1171.6	1165.5	1023.2	1011.6	1008.6	1025.6	
Readmission Within 7 days per 1000 net Admissions	81.5	75.8	77.7	71.3	68.1	68.2	70.2	
Readmission Within 15 days per 1000 net Admissions	138.0	126.3	121.3	116.1	113.9	113.4	116.0	
Readmission Within 30 days per 1000 net Admissions	207.4	187.1	177.5	169.5	167.7	169.4	172.2	
Age	68.5	68.6	68.8	69.9	70.0	70.3	70.6	
Attachment to Practice	74.2	75.0	74.4	76.8	75.3	74.8	74.2	
Patients	3,922	5,587	7,080	10,908	11,631	12,614	14,054	

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 13: Average Hospital Stays by Year for All Patients with Diabetes Who were Admitted to Hospital (Excluding Day Care)

All RUBs *

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Patients with AC Stays	19,387	18,567	17,368	15,972	16,636	17,759	18,232	
Total AC Admissions	31,226	29,817	27,690	25,271	26,463	28,019	28,819	
Total AC Stays	28,654	27,263	25,412	23,263	24,326	25,878	26,704	
Total AC Episodes	24,719	23,631	21,898	20,121	20,956	22,306	23,026	
Total AC Days	223,798	217,637	198,420	185,414	191,494	199,624	211,801	
Average Acute Care Admissions (Admissions Excluding Day Care)	1.61	1.61	1.59	1.58	1.59	1.58	1.58	
Average Acute Care Admissions Excluding Transfers	1.48	1.47	1.46	1.46	1.46	1.46	1.46	
Average Acute Care Episodes (Readmissions Combined with Admission)	1.28	1.27	1.26	1.26	1.26	1.26	1.26	
Average Length of stay per regular admission	7.17	7.30	7.17	7.34	7.24	7.12	7.35	
Average Length of stay per hospital stay	7.81	7.98	7.81	7.97	7.87	7.71	7.93	
Average Length of stay per hospital episode	9.05	9.21	9.06	9.21	9.14	8.95	9.20	

All RUBs *

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Patients with AC Stays	7,910	10,577	12,828	15,834	16,848	17,573	19,142	
Total AC Admissions	12,047	15,871	19,124	23,650	25,125	26,464	28,995	
Total AC Stays	11,219	14,802	17,749	21,985	23,266	24,554	27,006	
Total AC Episodes	9,774	13,042	15,679	19,416	20,536	21,633	23,673	
Total AC Days	76,751	104,416	128,599	158,505	171,253	175,838	195,250	
Average Acute Care Admissions (Admissions Excluding Day Care)	1.52	1.50	1.49	1.49	1.49	1.51	1.51	
Average Acute Care Admissions Excluding Transfers	1.42	1.40	1.38	1.39	1.38	1.40	1.41	
Average Acute Care Episodes (Readmissions Combined with Admission)	1.24	1.23	1.22	1.23	1.22	1.23	1.24	
Average Length of stay per regular admission	6.37	6.58	6.72	6.70	6.82	6.64	6.73	
Average Length of stay per hospital stay	6.84	7.05	7.25	7.21	7.36	7.16	7.23	
Average Length of stay per hospital episode	7.85	8.01	8.20	8.16	8.34	8.13	8.25	

Table 14: Average Hospital Stays by Year for All Patients with Diabetes who were Admitted to Hospital (Excluding Day Care): RUB 3

Resource Utilization Band 3

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Patients with AC Stays	5,652	5,181	4,645	3,878	4,077	4,193	4,201	
Total AC Admissions	6,777	6,181	5,499	4,568	4,805	4,890	4,911	
Total AC Stays	6,537	5,940	5,323	4,434	4,639	4,776	4,789	
Total AC Episodes	6,206	5,661	5,061	4,221	4,409	4,526	4,549	
Total AC Days	32,723	30,679	26,395	21,855	23,186	22,747	23,391	
Average Acute Care Admissions (Admissions Excluding Day Care)	1.20	1.19	1.18	1.18	1.18	1.17	1.17	
Average Acute Care Admissions Excluding Transfers	1.16	1.15	1.15	1.14	1.14	1.14	1.14	
Average Acute Care Episodes (Readmissions Combined with Admission)	1.10	1.09	1.09	1.09	1.08	1.08	1.08	
Average Length of stay per regular admission	4.83	4.96	4.80	4.78	4.83	4.65	4.76	
Average Length of stay per hospital stay	5.01	5.16	4.96	4.93	5.00	4.76	4.88	
Average Length of stay per hospital episode	5.27	5.42	5.22	5.18	5.26	5.03	5.14	

Resource Utilization Band 3

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Patients with AC Stays	2,499	3,232	3,653	3,976	4,195	4,149	4,429	
Total AC Admissions	2,911	3,703	4,185	4,513	4,787	4,726	5,028	
Total AC Stays	2,824	3,603	4,067	4,412	4,657	4,622	4,900	
Total AC Episodes	2,697	3,467	3,915	4,248	4,482	4,426	4,694	
Total AC Days	12,182	15,993	18,190	19,119	20,139	19,188	20,785	
Average Acute Care Admissions (Admissions Excluding Day Care)	1.16	1.15	1.15	1.14	1.14	1.14	1.14	
Average Acute Care Admissions Excluding Transfers	1.13	1.11	1.11	1.11	1.11	1.11	1.11	
Average Acute Care Episodes (Readmissions Combined with Admission)	1.08	1.07	1.07	1.07	1.07	1.07	1.06	
Average Length of stay per regular admission	4.18	4.32	4.35	4.24	4.21	4.06	4.13	
Average Length of stay per hospital stay	4.31	4.44	4.47	4.33	4.32	4.15	4.24	
Average Length of stay per hospital episode	4.52	4.61	4.65	4.50	4.49	4.34	4.43	

Table 15: Average Hospital Stays by Year for All Patients with Diabetes who were Admitted to Hospital (Excluding Day Care): RUB 4

Resource Utilization Band 4

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Patients with AC Stays	6,653	6,268	5,886	5,391	5,669	6,001	5,893	
Total AC Admissions	9,620	8,941	8,331	7,571	7,942	8,314	8,074	
Total AC Stays	8,995	8,328	7,789	7,077	7,450	7,813	7,629	
Total AC Episodes	8,035	7,523	7,007	6,387	6,708	7,049	6,887	
Total AC Days	58,700	54,748	50,675	46,389	46,205	47,402	47,733	
Average Acute Care Admissions (Admissions Excluding Day Care)	1.45	1.43	1.42	1.40	1.40	1.39	1.37	
Average Acute Care Admissions Excluding Transfers	1.35	1.33	1.32	1.31	1.31	1.30	1.29	
Average Acute Care Episodes (Readmissions Combined with Admission)	1.21	1.20	1.19	1.18	1.18	1.17	1.17	
Average Length of stay per regular admission	6.10	6.12	6.08	6.13	5.82	5.70	5.91	
Average Length of stay per hospital stay	6.53	6.57	6.51	6.55	6.20	6.07	6.26	
Average Length of stay per hospital episode	7.31	7.28	7.23	7.26	6.89	6.72	6.93	

Resource Utilization Band 4

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
Patients with AC Stays	2,678	3,599	4,311	5,112	5,461	5,770	6,125	
Total AC Admissions	3,727	4,934	5,777	6,796	7,222	7,632	8,082	
Total AC Stays	3,497	4,653	5,430	6,412	6,843	7,209	7,692	
Total AC Episodes	3,195	4,254	4,977	5,899	6,261	6,639	7,047	
Total AC Days	21,132	28,883	33,450	37,454	40,095	41,002	42,950	
Average Acute Care Admissions (Admissions Excluding Day Care)	1.39	1.37	1.34	1.33	1.32	1.32	1.32	
Average Acute Care Admissions Excluding Transfers	1.31	1.29	1.26	1.25	1.25	1.25	1.26	
Average Acute Care Episodes (Readmissions Combined with Admission)	1.19	1.18	1.15	1.15	1.15	1.15	1.15	
Average Length of stay per regular admission	5.67	5.85	5.79	5.51	5.55	5.37	5.31	
Average Length of stay per hospital stay	6.04	6.21	6.16	5.84	5.86	5.69	5.58	
Average Length of stay per hospital episode	6.61	6.79	6.72	6.35	6.40	6.18	6.09	

Table 16: Average Hospital Stays by Year for All Patients with Diabetes who were Admitted to Hospital (Excluding Day Care): RUB 5

Resource Utilization Band 5

Averages		Diabetes Incentive						
		No						
		Year						
		200405	200506	200607	200708	200809	200910	201011
	Patients with AC Stays	7,082	7,118	6,837	6,703	6,890	7,565	8,138
	Total AC Admissions	14,829	14,695	13,860	13,132	13,716	14,815	15,834
	Total AC Stays	13,122	12,995	12,300	11,752	12,237	13,289	14,286
	Total AC Episodes	10,478	10,447	9,830	9,513	9,839	10,731	11,590
	Total AC Days ¹	132,375	132,210	121,350	117,170	122,103	129,475	140,677
	Average Acute Care Admissions (Admissions Excluding Day Care)	2.09	2.06	2.03	1.96	1.99	1.96	1.95
	Average Acute Care Admissions Excluding Transfers	1.85	1.83	1.80	1.75	1.78	1.76	1.76
	Average Acute Care Episodes (Readmissions Combined with Admission)	1.48	1.47	1.44	1.42	1.43	1.42	1.42
	Average Length of stay per regular admission	8.93	9.00	8.76	8.92	8.90	8.74	8.88
	Average Length of stay per hospital stay	10.09	10.17	9.87	9.97	9.98	9.74	9.85
	Average Length of stay per hospital episode	12.63	12.66	12.34	12.32	12.41	12.07	12.14

Resource Utilization Band 5

Averages		Diabetes Incentive						
		Yes						
		Year						
		200405	200506	200607	200708	200809	200910	201011
	Patients with AC Stays	2,733	3,746	4,864	6,746	7,192	7,654	8,588
	Total AC Admissions	5,409	7,234	9,162	12,341	13,116	14,106	15,885
	Total AC Stays	4,898	6,546	8,252	11,161	11,766	12,723	14,414
	Total AC Episodes	3,882	5,321	6,787	9,269	9,793	10,568	11,932
	Total AC Days	43,437	59,540	76,959	101,932	111,019	115,648	131,515
	Average Acute Care Admissions (Admissions Excluding Day Care)	1.98	1.93	1.88	1.83	1.82	1.84	1.85
	Average Acute Care Admissions Excluding Transfers	1.79	1.75	1.70	1.65	1.64	1.66	1.68
	Average Acute Care Episodes (Readmissions Combined with Admission)	1.42	1.42	1.40	1.37	1.36	1.38	1.39
	Average Length of stay per regular admission	8.03	8.23	8.40	8.26	8.46	8.20	8.28
	Average Length of stay per hospital stay	8.87	9.10	9.33	9.13	9.44	9.09	9.12
	Average Length of stay per hospital episode	11.19	11.19	11.34	11.00	11.34	10.94	11.02

5. A1C TESTS

Table 17 shows that patients who received incentive based care consistently, over time and across RUBs, had more A1C tests than patients who did not receive incentive based care.

Table 17: Average Number of A1C Tests by Year for All Patients with Diabetes

Average Number of A1C Tests	Diabetes Incentive						
	No						
	Year						
	200405	200506	200607	200708	200809	200910	201011
RUB							
3	1.44	1.43	1.42	1.34	1.36	1.37	1.36
4	1.44	1.46	1.42	1.46	1.42	1.45	1.45
5	1.50	1.53	1.53	1.48	1.46	1.50	1.51

Average Number of A1C Tests	Diabetes Incentive						
	Yes						
	Year						
	200405	200506	200607	200708	200809	200910	201011
RUB							
3	2.29	2.36	2.39	2.39	2.42	2.43	2.46
4	2.43	2.49	2.52	2.59	2.61	2.61	2.62
5	2.48	2.56	2.61	2.67	2.66	2.66	2.67

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

6. ADJUSTED COST UTILIZATION AND HOSPITAL DATA

To summarize, Tables 18 and 19 provide basic, unadjusted data on numbers of patients and costs by age, gender and attachment to practice. As can be seen in Table 19, the average, annual unadjusted costs for patients who did not, and did, receive incentive based care were \$5,225 and \$4,873, respectively.

When one adjusts for differences in the distribution of age, gender and RUB levels, annual costs are still somewhat lower for patients who received incentive based care, compared to those who did not. Table 20 presents data on comparative costs by RUB level. For RUB 3, annual costs were higher for patients who received incentive based care. For RUBs 4 and 5 the reverse is true, as the annual costs for patients who received incentive based care was lower than for patients who did not. Essentially, all of the savings are in hospital costs.

Table 21 shows the overall comparative costs for RUBs 3, 4 and 5 combined. The average, annual, adjusted cost for patients who did not receive incentive based care was \$5,059, while it was \$4,993 for those who did receive incentive based care. However, this group also had a higher percentage of attachment to practice. Because there is an inverse relationship between attachment to practice and costs, it may also be appropriate to adjust for attachment levels which we do below.

In terms of hospital utilization, data by RUB level is presented in Table 22 and, overall, in Table 23. These data are adjusted for age, gender and RUB level and contain much of the same information contained in Tables 9 to 16. While there are some differences, the overall results of shorter lengths of stay, number of hospital days per 1,000, for patients who received incentive based care continued to hold.

With regard to adjustments by age, gender, RUB and attachment level, overall costs were greater for patients who received incentive based care. Tables 24 and 25 present comparative, average, annual, adjusted, total costs by RUB and shows that total costs were higher for patients who received incentive based care for RUBs 3 and 4 and overall. The annual costs for patients who received incentive based care were \$5,091 compared to \$4,943 for those who did not. Table 26, however, indicates that in terms of hospital related figures, those who received incentive based care still had shorter lengths of stay and fewer hospital days than patients who did not receive incentive based care.

Our analysis is based on a selected sample. There are some patients who are outside our selection parameters who also receive incentive based care. Thus, the total cost of diabetes incentives is greater than the total cost of incentives in our sample. However, cost avoidance data are limited to our sample. Thus, in order to obtain a bottom line estimate of the cost implications of incentives we include all costs for incentives and compare these costs to the costs potentially avoided due to the use of incentive payments.

The bottom line appears to be that the diabetes incentive has resulted in a loss of \$24.7 million, i.e., the cost of the incentives and \$3.1 million over and above the cost of the incentives (see Table 27). It should be noted, however, that the cost results for the other three chronic conditions (documented in other reports) are positive so, on balance, it does appear that, overall, for

the four chronic conditions of diabetes, chf, COPD and hypertension, incentive payments do appear to result in net cost avoidance.

Table 18: Number of Patients with Diabetes Who Did, and Did Not, Receive Incentive Based Care (April 2010 to March 2011)

Averages for 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	104,037	69,708	21,775	12,554	134,665	94,403	26,208	14,054
Client Age Group								
0 - 44	11,293	8,244	2,462	587	7,816	6,147	1,319	350
45 - 59	27,153	20,396	4,452	2,305	32,661	25,680	4,838	2,143
60 - 69	27,339	19,021	5,369	2,949	39,644	28,818	7,241	3,585
70 - 79	23,300	14,333	5,449	3,518	34,800	22,785	7,608	4,407
80 and over	14,952	7,714	4,043	3,195	19,744	10,973	5,202	3,569
Gender								
Females	53,187	36,535	11,175	5,477	62,972	44,923	12,117	5,932
Males	50,850	33,173	10,600	7,077	71,693	49,480	14,091	8,122
Attachment to Practice								
1. Less than 40%	3,935	1,854	1,016	1,065	2,456	1,055	592	809
2. 40% - 59%	16,205	9,304	3,864	3,037	13,940	7,983	3,163	2,794
3. 60% - 79%	22,616	13,874	5,277	3,465	25,646	15,795	5,907	3,944
4. 80% - 89%	18,844	12,904	3,920	2,020	25,135	17,635	5,014	2,486
5. 90% or More	42,437	31,772	7,698	2,967	67,488	51,935	11,532	4,021

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011

Table 19: Total Cost of Diabetes for Patients Who Did, and Did Not, Receive Incentive Based Care (April 2010 to March 2011)

Averages for Diabetes	Incentive							
	No				Yes			
	Number of Patients				Number of Patients			
	All	Resource Utilization Band			All	Resource Utilization Band		
		3	4	3		3	4	5
All	5,225	2,351	6,441	19,071	4,873	2,565	6,351	17,619
Client Age Group								
0 - 44	3,839	1,923	6,487	19,647	3,563	2,002	6,859	18,564
45 - 59	3,917	1,896	5,726	18,301	3,527	2,006	5,835	16,543
60 - 69	4,830	2,251	6,080	19,187	4,465	2,428	6,149	17,441
70 - 79	6,270	2,909	6,801	19,141	5,734	3,095	6,582	17,913
80 and over	7,738	3,221	7,192	19,337	6,920	3,449	6,648	17,990
Gender								
Females	4,968	2,415	6,559	18,750	4,859	2,699	6,596	17,669
Males	5,493	2,280	6,316	19,320	4,886	2,444	6,141	17,583
Attachment to Practice								
1. Less than 40%	12,001	3,508	9,539	29,133	14,903	3,958	11,428	31,720
2. 40% - 59%	8,041	2,757	8,355	23,830	8,520	3,057	8,598	24,041
3. 60% - 79%	6,334	2,586	7,101	20,173	6,348	2,878	7,375	18,707
4. 80% - 89%	4,552	2,269	6,186	15,960	4,521	2,509	6,290	15,233
5. 90% or More	3,229	2,096	4,747	11,420	3,325	2,385	4,977	10,729

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011

Table 20: Annual Costs for Diabetes Adjusted for Gender and Age Group within RUB (April 2010 to March 2011)

	Resource Utilization Band					
	3		4		5	
	Diabetes Incentive		Diabetes Incentive		Diabetes Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	428	589	741	951	1,234	1,424
Specialist Amount	322	295	851	790	2,076	1,914
Diag Fac Amount	343	347	632	633	980	963
GP Specialist and Diag Fac Amounts	1,094	1,231	2,224	2,374	4,289	4,301
Hospital Costs	576	450	2,905	2,450	12,883	11,190
Pharmacy Costs	710	863	1,322	1,542	1,905	2,127
Total Cost	2,379	2,544	6,451	6,367	19,077	17,618
Attachment to Practice	82.20	86.15	77.57	81.42	70.84	74.04
Attachment to Practice, Excluding Incentives	81.69	83.99	76.85	79.13	70.01	71.82

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 21: Annual Costs for Diabetes Adjusted for RUB, Gender, and Age Group (April 2010 to March 2011)

	Diabetes Incentive	
	No Incentive	Incentive
GP Amount	581	755
Specialist Amount	624	575
Diag Fac Amount	472	473
GP Specialist and Diag Fac Amounts	1,677	1,803
Hospital Costs	2,416	2,049
Pharmacy Costs	966	1,141
Total Cost	5,059	4,993
Attachment to Practice	80.00	83.85
Attachment to Practice, Excluding Incentives	79.41	81.65

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011

Table 22: Service Rates for Diabetes Adjusted for Gender and Age Group within RUB (April 2010 to March 2011)

	Resource Utilization Band					
	3		4		5	
	Diabetes Incentive		Diabetes Incentive		Diabetes Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Services	10.8	11.2	17.4	18.1	28.3	28.5
Specialist Services	4.1	3.8	10.8	10.0	26.1	23.9
Diag Fac Service	28.3	30.7	45.3	47.5	69.0	69.9
GP Specialist and Diag Fac Services	43.2	45.6	73.5	75.7	123.4	122.3
Hospital Days per 1000 Patients	504.5	374.7	2,530.9	2,014.1	11,762.7	9,934.2
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	240.7	208.2	724.8	670.9	1,817.9	1,700.3
Hospital Day Care Days per 1000 Patients	170.1	155.1	361.8	355.4	562.1	565.2
Hospital Transfers per 1000 Patients	1.7	1.4	20.0	15.2	123.5	104.4
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	68.9	51.7	342.9	300.3	1,132.3	1,030.7
Readmission Within 7 days per 1000 net Admissions	21.7	24.0	40.9	38.0	76.1	70.8
Readmission Within 15 days per 1000 net Admissions	35.3	31.1	65.3	60.7	125.9	117.2
Readmission Within 30 days per 1000 net Admissions	49.4	42.1	95.2	86.7	187.9	173.8
Average Length of stay per regular admission	4.7	4.1	6.0	5.3	8.9	8.3
Average Length of stay per hospital stay	4.9	4.2	6.3	5.5	9.9	9.1
Average Length of stay per hospital stay episode	5.1	4.4	7.0	6.0	12.2	11.0

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 23: Service Rates for Diabetes Adjusted for RUB, Gender, and Age Group (April 2010 to March 2011)

	Diabetes Incentive	
	No Incentive	Incentive
Attachment to Practice	80.0	83.8
Attachment to Practice, Excluding Incentives	79.4	81.7
GP Services	14.1	14.5
Specialist Services	7.9	7.3
Diag Fac Service	36.2	38.4
GP Specialist and Diag Fac Services	58.2	60.2
Hospital Days per 1000 Patients	2,166.8	1,769.9
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	513.9	467.5
Hospital Day Care Days per 1000 Patients	252.3	241.1
Hospital Transfers per 1000 Patients	19.0	15.6
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	242.5	210.8
Readmission Within 7 days per 1000 net Admissions	55.5	53.5
Readmission Within 15 days per 1000 net Admissions	91.0	86.5
Readmission Within 30 days per 1000 net Admissions	134.5	126.6
Average Length of stay per regular admission	7.3	6.8
Average Length of stay per hospital stay	7.9	7.3
Average Length of stay per hospital stay episode	9.1	8.3

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011

Table 24: Annual Costs for Diabetes Adjusted by Gender, Age Group and Attachment within RUB (April 2010 to March 2011)

Average Total Costs			Diabetes Incentive	
			No Incentive	Incentive
Resource Utilization Band				
3			2,335	2,575
4			6,279	6,506
5			18,619	18,058

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 25: Annual Costs for Diabetes Adjusted by RUB, Attachment, Gender, and Age Group (April 2010 to March 2011)

	Diabetes Incentive	
	No Incentive	Incentive
GP Amount	574	761
Specialist Amount	612	584
Diag Fac Amount	471	474
GP Specialist and Diag Fac Amounts	1,658	1,819
Hospital Costs	2,318	2,131
Pharmacy Costs	967	1,140
Average Total Cost	4,943	5,091

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 26: Service Rates for Diabetes Adjusted by RUB, Attachment, Gender, and Age Group (April 2010 to March 2011)

	Diabetes Incentive	
	No Incentive	Incentive
Attachment to Practice	82.0	82.3
GP Services	13.9	14.7
Specialist Services	7.8	7.4
Diag Fac Service	36.2	38.4
GP Specialist and Diag Fac Services	57.9	60.5
Hospital Days per 1000 Patients	2,079.0	1,842.8
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	498.7	479.4
Hospital Day Care Days per 1000 Patients	249.1	243.4
Hospital Transfers per 1000 Patients	17.7	16.6
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	231.9	219.4
Readmission Within 7 days per 1000 net Admissions	54.9	54.6
Readmission Within 15 days per 1000 net Admissions	90.2	88.0
Readmission Within 30 days per 1000 net Admissions	133.4	128.5
Average Length of stay per regular admission	7.3	6.8
Average Length of stay per hospital stay	7.9	7.3
Average Length of stay per hospital stay episode	9.1	8.4

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011

Table 27: Summary of Diabetes Incentive Cost Avoidance Adjusted for RUB, Attachment, Gender and Age Group (April 2010 to March 2011)

Total Cost Per Person With Incentives	5,091
Total Cost Per Person With Incentives Excluding Incentive Amount(\$125)	4,966
Total Cost Per Person Without Incentives	4,943
Savings/Cost Per Person With Incentives Excluding Incentive Amount	-23
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	-3,068,294
Total Cost of Diabetes Incentives	-21,632,125
Net Dollar Savings/Cost	-24,700,419

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

7. DISCUSSION

As the GPSC has introduced more incentive payments over time the interpretation of the cost-effectiveness results has become more clouded. Initially, one could conduct an analysis of people who did, and did not, receive the diabetes incentive because the only incentives were diabetes and chf. As more incentives were added it was possible for patients who did, and did not, receive a diabetes incentive to also receive incentive payments for other conditions. For example, a diabetic who did not receive care using a diabetes incentive may nevertheless have received an incentive for COPD. Also, a patient who received a diabetes incentive may also have received, in addition, incentive based care for COPD. This pattern became even more complex when the complex care incentive was introduced. Table 28 shows this complexity, excluding hypertension (patients can not receive care from a diabetes and a hypertension incentive). In Table 28 one can see that there were 134,665 patients who received care from a diabetes incentive payment. Of these patients some 53,464 also received care from one or more other incentive payments. Similarly, of the 104,037 diabetics who did not receive care using a diabetes incentive, some 18,703, nevertheless, received care from incentive payments for other conditions. Please note that people could have combinations of Complex Care, CHF and COPD, that is why these three columns do not add up to the column marked CHF, COPD, Complex Care Incentive.

Having noted the above, our analysis still constitutes an analysis of diabetes patients who did, and did not, receive a diabetes incentive. However, given this complexity we also conducted analyses of patients who only had diabetes *per se*. Tables 29 and 30 show the unadjusted data and indicate that the average annual cost was \$3,260 for patients who had care from a diabetes incentive and \$3,413 from those who did not. Table 31 shows the comparative costs once one adjusts for age, gender and RUB level and Table 32 shows the comparative costs when one adjusts for age, gender, RUB and attachment level. It is interesting to note that in spite of this complexity, the adjusted cost differential was similar when one considers all diabetes patients and diabetes patients who only had diabetes and no other condition. For example, our main analysis indicated that people who had incentive based care cost \$5,091 per year compared to those who did not who cost \$4,943, a cost differential of minus \$148 (see Table 25). For patients who only had diabetes the comparative costs were \$3,389 and \$3,243, a differential of minus \$146 (see Table 32). This seems to indicate that in spite of the recent complexity, the overall cost avoidance analysis is still fairly sound as the cost differentials are almost the same for all diabetics and patients who only had diabetes.

Table 28: Incentive Count Excluding Hypertension for Diabetes Patients (April 2010 to March 2011)

	Patients With				
	No of Patients	CHF, COPD, Complex Care Incentive	Complex Care Incentive	CHF Incentive	COPD Incentive
Diabetes Incentive					
No Incentive	104,037	18,703	17,065	2,038	2,659
Incentive	134,665	53,464	51,582	5,265	5,844
All	238,702	72,167	68,647	7,303	8,503

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.

Table 29: Number of Patients with Diabetes Who Did, or Did Not, Receive Incentive Based Care Excluding All Patients with Complex Care, COPD, CHF and Hypertension (April 2010 to March 2011)

Averages for 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	64,027	48,982	10,774	4,271	82,674	65,754	12,235	4,685
Client Age Group								
0 - 44	8,587	6,537	1,741	309	5,950	4,905	873	172
45 - 59	18,938	15,466	2,517	955	23,259	19,690	2,659	910
60 - 69	17,474	13,700	2,680	1,094	25,463	20,554	3,601	1,308
70 - 79	12,719	9,211	2,404	1,104	19,301	14,683	3,237	1,381
80 and over	6,309	4,068	1,432	809	8,701	5,922	1,865	914
Gender								
Females	34,175	26,295	5,934	1,946	40,257	32,149	6,039	2,069
Males	29,852	22,687	4,840	2,325	42,417	33,605	6,196	2,616
Attachment to Practice								
1. Less than 40%	2,209	1,305	566	338	1,298	751	295	252
2. 40% - 59%	9,725	6,707	1,985	1,033	8,101	5,649	1,534	918
3. 60% - 79%	13,565	9,817	2,643	1,105	15,230	11,130	2,819	1,281
4. 80% - 89%	11,756	9,129	1,945	682	15,513	12,430	2,288	795
5. 90% or More	26,772	22,024	3,635	1,113	42,532	35,794	5,299	1,439

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011

Table 30: Total Cost of Diabetes for Patients Who Did, and Did Not, Receive Incentive Based Care Excluding All Patients with Complex Care, COPD, CHF and Hypertension (April 2010 to March 2011)

Averages for Diabetes	Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
		3	4	5		3	4	5
All	3,413	2,013	5,421	14,398	3,260	2,174	5,293	13,189
Client Age Group								
0 - 44	3,117	1,780	5,958	15,400	2,882	1,864	6,290	14,597
45 - 59	2,788	1,697	4,919	14,844	2,585	1,775	4,956	13,173
60 - 69	3,214	1,958	5,189	14,111	3,075	2,110	5,135	12,565
70 - 79	4,081	2,495	5,691	13,810	3,873	2,619	5,332	13,786
80 and over	4,891	2,683	5,633	14,680	4,505	2,879	5,543	12,928
Gender								
Females	3,378	2,090	5,607	13,984	3,369	2,316	5,616	13,161
Males	3,453	1,924	5,193	14,746	3,157	2,039	4,978	13,211
Attachment to Practice								
1. Less than 40%	7,138	3,237	8,231	20,368	8,000	3,460	8,434	21,022
2. 40% - 59%	5,015	2,416	6,707	18,640	5,219	2,599	7,021	18,325
3. 60% - 79%	3,978	2,205	5,791	15,389	4,156	2,470	6,256	14,178
4. 80% - 89%	3,112	1,940	5,290	12,582	3,020	2,100	5,087	11,455
5. 90% or More	2,369	1,762	4,082	8,779	2,509	2,014	4,194	8,617

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011

Table 31: Adjusted Rates for Diabetes by RUB, Gender, and Age Group Excluding All Patients with Complex Care, COPD, CHF and Hypertension (April 2010 to March 2011)

	Diabetes Incentive	
	No Incentive	Incentive
GP Amount	468	616
Specialist Amount	457	424
Diag Fac Amount	373	375
GP Specialist and Diag Fac Amounts	1,298	1,415
Hospital Costs	1,359	1,112
Pharmacy Costs	656	808
Total Cost	3,313	3,334
Attachment to Practice	80.56	84.48
Attachment to Practice, Excluding Incentives	80.12	82.40

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal2010/2011

Table 32: Adjusted Rates for Diabetes by RUB, Attachment, Gender, and Age Group Excluding All Patients with Complex Care, COPD, CHF and Hypertension (April 2010 to March 2011)

	Diabetes Incentive	
	No Incentive	Incentive
GP Amount	463	620
Specialist Amount	450	430
Diag Fac Amount	372	376
GP Specialist and Diag Fac Amounts	1,285	1,425
Hospital Costs	1,300	1,157
Pharmacy Costs	658	807
Average Total Cost	3,243	3,389

Source: British Columbia Ministry of Health Services, Primary Care Data Repository, Fiscal 2010/2011.