

The General Practice Services Committee

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

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

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February 2013

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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 for hypertension were \$3,644 and \$2,941 respectively. When one adjusts for the impacts of age, gender and RUB distributions, the costs were \$3,522 and \$3,048 respectively.
- When we adjust for age, gender, RUB and attachment level, however, costs for patients who received incentive based care compared to those who did not, were \$3,135 compared to \$3,443. This resulted in a cost avoidance (over and above the costs of the incentives themselves), based on adjusted data, of \$50.3 million.
- 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 were maintained when one adjusted for differences in age, gender, RUB and attachment level.

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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 Hypertension 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 hypertension patients, on the hypertension 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.

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.

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 unlike diabetes, CHF, and COPD, the average annual costs for patients who received incentive based care were lower for RUBs 3, 4 and 5.

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 312 patients on the hypertension 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 three services. However, for consistency across chronic disease categories, we have only included patients who had at least five services in our analysis. 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 548,040 to 529,688, Table 4 presents data on the patients in our analysis. After we applied the RUB and services screens 362,464 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 \$3,644 for patients who did not have an incentive compared to \$2,941 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 RUBs 4 and 5 patients who received incentive based care.

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

Hypertension	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	548,040	100.0	323,460	224,580	100.0	100.0	3,111	2,684	41.0
GP Services									
01	23,050	4.2	21,653	1,397	6.7	0.6	617	395	6.1
02	31,605	5.8	26,805	4,800	8.3	2.1	748	472	15.2
03	40,603	7.4	29,651	10,952	9.2	4.9	867	606	27.0
04	47,939	8.7	31,088	16,851	9.6	7.5	1,054	727	35.2
05	50,510	9.2	28,867	21,643	8.9	9.6	1,316	891	42.8
06	48,040	8.8	25,881	22,159	8.0	9.9	1,477	1,078	46.1
07	43,078	7.9	22,221	20,857	6.9	9.3	1,732	1,392	48.4
08	37,448	6.8	18,802	18,646	5.8	8.3	2,100	1,561	49.8
09	31,728	5.8	15,782	15,946	4.9	7.1	2,400	1,817	50.3
10-14	97,388	17.8	48,730	48,658	15.1	21.7	3,309	2,599	50.0
15-19	42,153	7.7	22,124	20,029	6.8	8.9	5,172	4,108	47.5
20 or More	54,498	9.9	31,856	22,642	9.8	10.1	14,020	10,693	41.5
Resource Utilization Band									
1	7,884	1.4	7,884	.	2.4	.	187	.	0.0
2	82,170	15.0	52,525	29,645	16.2	13.2	381	430	36.1
3	351,184	64.1	198,856	152,328	61.5	67.8	1,676	1,659	43.4
4	72,324	13.2	42,986	29,338	13.3	13.1	5,815	5,014	40.6
5	34,478	6.3	21,209	13,269	6.6	5.9	18,935	14,345	38.5

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

Table 2: Patients with Hypertension For Rubs 1 to 5 and at Least One GP Service (April 2010 to March 2011)

Hypertension	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	548,040	100.0	323,460	224,580	100.0	100.0	3,111	2,684	41.0
1. Rub 1 or 2 with Less than 5 GP services	63,148	11.5	48,098	15,050	14.9	6.7	260	301	23.8
2. Rub 1 or 2 with 5 or More GP services	26,906	4.9	12,311	14,595	3.8	6.5	728	562	54.2
3. Rub 3,4,5 with Less than 5 GP services	80,049	14.6	61,099	18,950	18.9	8.4	1,299	906	23.7
4. Rub 3,4,5 with 5 or More GP services	377,937	69.0	201,952	175,985	62.4	78.4	4,483	3,255	46.6

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

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

Hypertension	Number of Patients	Number of Patients Resource Utilization Band					% of Patients Resource Utilization Band				
		1	2	3	4	5	1	2	3	4	5
All	548,040	7,884	82,170	351,184	72,324	34,478	100.0	100.0	100.0	100.0	100.0
GP Services											
01	23,050	4,536	13,019	5,214	206	75	57.5	15.8	1.5	0.3	0.2
02	31,605	1,750	14,936	14,322	478	119	22.2	18.2	4.1	0.7	0.3
03	40,603	768	14,744	23,866	1,052	173	9.7	17.9	6.8	1.5	0.5
04	47,939	341	13,054	32,407	1,827	310	4.3	15.9	9.2	2.5	0.9
05	50,510	208	10,210	36,991	2,690	411	2.6	12.4	10.5	3.7	1.2
06	48,040	107	6,489	37,399	3,478	567	1.4	7.9	10.6	4.8	1.6
07	43,078	42	3,793	34,461	3,972	810	0.5	4.6	9.8	5.5	2.3
08	37,448	32	2,137	29,945	4,354	980	0.4	2.6	8.5	6.0	2.8
09	31,728	24	1,264	24,936	4,394	1,110	0.3	1.5	7.1	6.1	3.2
10-14	97,388	36	2,000	69,762	19,080	6,510	0.5	2.4	19.9	26.4	18.9
15-19	42,153	8	315	23,902	12,238	5,690	0.1	0.4	6.8	16.9	16.5
20 or More	54,498	32	209	17,979	18,555	17,723	0.4	0.3	5.1	25.7	51.4

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

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

Hypertension	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	529,688	100.0	308,475	221,213	100.0	100.0	2,526	2,430	41.8
1. Rub 1 or 2 with Less than 5 GP services	62,397	11.8	47,394	15,003	15.4	6.8	254	300	24.0
2. Rub 1 or 2 with 5 or More GP services	26,365	5.0	11,797	14,568	3.8	6.6	685	561	55.3
3. Rub 3,4,5 with Less than 5 GP services	78,462	14.8	59,614	18,848	19.3	8.5	1,140	884	24.0
4. Rub 3,4,5 with 5 or More GP services	362,464	68.4	189,670	172,794	61.5	78.1	3,644	2,941	47.7

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 Hypertension

All RUBs *

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
Average	GP Amount	411	455	450	475	486	429	489	473	499	505
	Specialist Amount	419	440	458	472	503	349	359	375	385	407
	Diag Fac Amount	365	369	383	389	392	339	336	348	354	357
	GP Specialist and Diag Fac Amounts	1,196	1,264	1,291	1,335	1,382	1,117	1,184	1,196	1,239	1,268
	Pharmacy Costs	519	516	519	511	511	501	485	486	487	470
	Hospital Costs	1,627	1,648	1,672	1,656	1,751	1,161	1,142	1,194	1,166	1,202
	Total Costs	3,342	3,428	3,481	3,502	3,644	2,779	2,812	2,876	2,892	2,941
	Patients	205,578	186,066	183,842	192,594	189,670	115,327	152,760	161,390	165,942	172,794

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 Hypertension for RUB 3

Resource Utilization Band 3

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
Average	GP Amount	335	357	356	371	376	374	400	394	412	411
	Specialist Amount	254	261	271	275	290	230	232	240	244	256
	Diag Fac Amount	285	281	292	295	295	276	267	277	281	281
	GP Specialist and Diag Fac Amounts	874	898	919	942	961	881	899	911	937	949
	Pharmacy Costs	406	381	379	365	355	418	384	384	372	356
	Hospital Costs	584	579	591	567	579	480	457	473	444	449
	Total Costs	1,865	1,858	1,889	1,874	1,896	1,778	1,740	1,768	1,753	1,754
	Patients	156,107	137,631	135,668	141,027	136,961	93,927	120,084	126,566	128,749	133,135

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 Hypertension for RUB 4

Resource Utilization Band 4

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
Average	GP Amount	572	637	619	652	661	602	717	672	707	714
	Specialist Amount	715	715	739	761	791	670	642	666	675	696
	Diag Fac Amount	552	546	562	567	566	550	525	539	541	541
	GP Specialist and Diag Fac Amounts	1,838	1,898	1,920	1,980	2,017	1,822	1,884	1,876	1,923	1,951
	Pharmacy Costs	760	774	792	783	783	791	767	787	808	773
	Hospital Costs	2,920	2,699	2,719	2,660	2,676	2,551	2,203	2,262	2,156	2,110
	Total Costs	5,519	5,371	5,431	5,423	5,476	5,164	4,854	4,925	4,887	4,834
	Patients	35,929	34,507	34,477	36,185	36,642	15,929	23,426	25,017	26,573	27,883

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 Hypertension for RUB 5

Resource Utilization Band 5

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
Average	GP Amount	862	981	953	1,010	1,030	863	1,066	982	1,038	1,063
	Specialist Amount	1,538	1,535	1,604	1,594	1,665	1,445	1,288	1,374	1,376	1,423
	Diag Fac Amount	801	797	828	825	824	807	748	771	770	772
	GP Specialist and Diag Fac Amounts	3,201	3,314	3,385	3,429	3,519	3,115	3,101	3,126	3,184	3,258
	Pharmacy Costs	1,177	1,203	1,222	1,207	1,218	1,092	1,094	1,037	1,078	1,043
	Hospital Costs	10,211	9,609	9,738	9,280	9,629	8,813	7,357	7,778	7,443	7,572
	Total Costs	14,589	14,126	14,345	13,916	14,366	13,021	11,552	11,941	11,705	11,873
	Patients	13,542	13,928	13,697	15,382	16,067	5,471	9,250	9,807	10,620	11,776

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 2006/07 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 9: Average Annual Service Summaries by Year for All Patients with Hypertension Who Did Not, and Did, Receive Incentive Based Care for All RUBS

All RUBs *

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
GP Services	12.5	12.6	12.3	12.4	12.5	12.4	12.6	12.1	12.3	12.2	
Specialist Services	6.1	6.0	6.1	6.1	6.4	5.3	5.1	5.2	5.1	5.3	
Diag Fac Service	24.2	25.6	26.5	26.6	26.8	23.7	24.7	25.4	25.6	25.8	
GP Specialist and Diag Fac Services	42.7	44.2	44.9	45.0	45.8	41.3	42.4	42.7	43.0	43.3	
Hospital Days per 1000 Patients	1413.9	1417.3	1433.2	1425.1	1501.9	956.5	935.4	974.2	961.7	991.1	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	416.6	420.8	427.5	425.2	442.6	340.4	339.0	346.3	345.8	358.2	
Hospital Day Care Days per 1000 Patients	222.0	225.1	232.3	232.0	244.5	205.5	205.9	211.5	213.6	224.0	
Hospital Transfers per 1000 Patients	13.7	13.7	13.5	13.5	13.9	7.9	7.1	7.6	7.9	7.9	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	180.9	182.0	181.7	179.8	184.3	127.0	126.1	127.1	124.3	126.3	
Readmission Within 7 days per 1000 net Admissions	45.1	47.5	45.4	48.3	46.5	38.0	36.7	35.7	36.4	39.0	
Readmission Within 15 days per 1000 net Admissions	70.1	73.0	72.4	75.2	73.8	59.4	56.7	57.2	58.7	59.2	
Readmission Within 30 days per 1000 net Admissions	100.2	104.6	104.1	106.9	106.3	84.6	80.3	83.4	83.1	84.2	
Age	63.9	63.5	63.4	63.4	63.5	66.3	66.1	66.2	66.5	66.6	
Attachment to Practice	80.0	79.4	79.2	78.6	78.7	85.1	84.8	84.4	83.8	83.9	
Patients	205,578	186,066	183,842	192,594	189,670	115,327	152,760	161,390	165,942	172,794	

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

Table 10: Average Annual Service Summaries by Year For All Patients with Hypertension Who Did Not, and Did, Receive Incentive Based Care: RUB 3

Resource Utilization Band 3

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
GP Services	10.4	10.4	10.1	10.2	10.1	10.8	10.7	10.5	10.5	10.3	
Specialist Services	3.9	3.8	3.8	3.6	3.8	3.7	3.5	3.5	3.4	3.5	
Diag Fac Service	19.8	20.5	21.3	21.3	21.3	20.4	20.9	21.5	21.6	21.6	
GP Specialist and Diag Fac Services	34.0	34.6	35.2	35.1	35.2	35.0	35.1	35.5	35.5	35.4	
Hospital Days per 1000 Patients	489.0	483.1	492.0	473.0	483.2	389.0	361.2	375.5	362.2	357.9	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	242.2	240.3	245.2	241.8	248.8	217.7	211.9	216.2	214.4	222.1	
Hospital Day Care Days per 1000 Patients	167.7	168.4	173.5	172.8	181.3	160.1	158.0	161.8	163.4	172.0	
Hospital Transfers per 1000 Patients	2.4	2.2	2.1	2.3	2.0	1.4	1.2	1.3	1.3	1.2	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	72.1	69.7	69.5	66.7	65.5	56.1	52.8	53.1	49.7	48.8	
Readmission Within 7 days per 1000 net Admissions	19.7	25.7	19.8	21.4	20.2	15.4	15.9	16.2	15.5	15.8	
Readmission Within 15 days per 1000 net Admissions	29.8	35.7	29.8	31.4	32.1	24.1	21.6	25.3	25.5	23.7	
Readmission Within 30 days per 1000 net Admissions	42.3	48.0	42.5	45.0	45.5	36.6	30.5	34.2	35.8	33.4	
Age	63.2	62.5	62.4	62.3	62.3	65.5	65.0	65.1	65.2	65.3	
Attachment to Practice	81.4	80.7	80.6	80.1	80.3	86.2	85.8	85.5	85.0	85.2	
Patients	156,107	137,631	135,668	141,027	136,961	93,927	120,084	126,566	128,749	133,135	

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

Table 11: Average Annual Service Summaries by Year For All Patients with Hypertension Who Did Not, and Did, Receive Incentive Based Care: RUB 4

Resource Utilization Band 4

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
GP Services	16.8	16.7	16.2	16.2	16.2	17.3	17.5	16.5	16.5	16.4	
Specialist Services	10.0	9.6	9.7	9.6	10.0	9.7	8.9	9.0	8.6	8.9	
Diag Fac Service	34.4	35.7	36.6	36.3	36.6	34.6	35.3	35.9	35.8	35.9	
GP Specialist and Diag Fac Services	61.2	62.0	62.4	62.2	62.8	61.5	61.7	61.4	60.9	61.2	
Hospital Days per 1000 Patients	2494.4	2268.7	2268.1	2236.6	2232.7	2078.0	1749.7	1822.0	1719.8	1682.4	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	735.8	707.3	713.3	691.3	701.2	683.0	623.6	637.6	618.8	618.3	
Hospital Day Care Days per 1000 Patients	344.3	344.8	353.5	342.6	354.2	359.7	345.7	356.4	347.8	357.4	
Hospital Transfers per 1000 Patients	26.5	24.1	22.9	22.5	21.8	19.5	14.3	14.6	15.5	13.6	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	365.0	338.4	336.9	326.3	325.3	303.8	263.6	266.6	255.5	247.4	
Readmission Within 7 days per 1000 net Admissions	41.7	42.2	41.7	41.9	42.7	34.1	31.3	30.7	34.0	36.4	
Readmission Within 15 days per 1000 net Admissions	63.8	62.2	65.2	62.8	65.6	51.9	48.7	51.4	53.8	50.7	
Readmission Within 30 days per 1000 net Admissions	90.2	89.1	93.6	86.6	89.9	75.4	69.1	75.0	73.6	71.2	
Age	65.0	65.0	64.8	65.3	65.5	68.8	69.4	69.4	69.9	69.8	
Attachment to Practice	76.7	76.9	76.7	76.1	75.9	81.9	82.5	81.6	81.0	80.9	
Patients	35,929	34,507	34,477	36,185	36,642	15,929	23,426	25,017	26,573	27,883	

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

Table 12: Average Annual Service Summaries by Year For All Patients with Hypertension Who Did Not, and Did, Receive Incentive Based Care: RUB 5

Resource Utilization Band 5

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
GP Services	24.7	24.5	23.8	23.9	24.2	24.2	24.7	23.0	23.2	23.4	
Specialist Services	20.5	19.9	20.4	19.8	20.7	19.7	16.6	17.5	17.3	17.7	
Diag Fac Service	48.7	51.2	52.4	51.9	52.2	48.2	47.1	48.1	48.4	48.8	
GP Specialist and Diag Fac Services	94.0	95.5	96.5	95.6	97.1	92.1	88.4	88.6	88.9	89.9	
Hospital Days per 1000 Patients	9208.8	8538.9	8654.3	8245.8	8519.1	7433.6	6327.6	6537.2	6332.9	6513.2	
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	1581.1	1494.0	1514.2	1480.8	1504.9	1448.9	1268.4	1281.8	1255.6	1281.7	
Hospital Day Care Days per 1000 Patients	523.8	488.2	509.2	514.4	533.1	535.6	473.4	483.3	485.6	496.4	
Hospital Transfers per 1000 Patients	111.1	101.8	103.0	94.9	97.0	85.2	65.5	71.1	68.9	69.6	
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	946.2	903.9	902.0	871.5	874.8	828.2	729.5	727.4	701.1	715.6	
Readmission Within 7 days per 1000 net Admissions	71.0	68.9	68.4	72.8	66.5	68.6	61.2	58.6	56.4	59.0	
Readmission Within 15 days per 1000 net Admissions	111.8	111.4	111.9	116.9	107.4	108.6	97.1	92.5	91.6	93.5	
Readmission Within 30 days per 1000 net Admissions	161.4	162.1	160.9	168.2	159.0	150.3	137.2	137.7	132.4	134.0	
Age	69.2	69.6	69.5	69.6	69.6	71.5	72.6	72.6	72.8	73.2	
Attachment to Practice	72.3	72.6	72.0	71.6	71.3	76.6	78.3	77.2	76.7	76.3	
Patients	13,542	13,928	13,697	15,382	16,067	5,471	9,250	9,807	10,620	11,776	

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 Hypertension Who were Admitted to Hospital (Excluding Day Care)

All RUBs *

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
	Patients with AC Stays	28,653	25,847	25,483	26,308	26,463	11,792	15,580	16,523	16,635	17,463
	Total AC Admissions	40,017	36,416	35,894	37,216	37,580	15,555	20,340	21,747	21,938	23,188
	Total AC Stays	37,192	33,859	33,404	34,624	34,950	14,642	19,260	20,520	20,630	21,824
	Total AC Episodes	33,465	30,318	29,928	30,922	31,235	13,403	17,714	18,808	18,915	19,987
	Total AC Days	245,032	221,829	220,779	229,798	238,492	86,612	111,451	123,084	124,143	132,542
	Average Acute Care Admissions (Admissions Excluding Day Care)	1.40	1.41	1.41	1.41	1.42	1.32	1.31	1.32	1.32	1.33
	Average Acute Care Admissions Excluding Transfers	1.30	1.31	1.31	1.32	1.32	1.24	1.24	1.24	1.24	1.25
	Average Acute Care Episodes (Readmissions Combined with Admission)	1.17	1.17	1.17	1.18	1.18	1.14	1.14	1.14	1.14	1.14
	Average Length of stay per regular admission	6.12	6.09	6.15	6.17	6.35	5.57	5.48	5.66	5.66	5.72
	Average Length of stay per hospital stay	6.59	6.55	6.61	6.64	6.82	5.92	5.79	6.00	6.02	6.07
	Average Length of stay per hospital episode	7.32	7.32	7.38	7.43	7.64	6.46	6.29	6.54	6.56	6.63

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

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

Resource Utilization Band 3

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
	Patients with AC Stays	10,067	8,517	8,397	8,379	8,009	4,786	5,811	6,115	5,841	5,962
	Total AC Admissions	11,632	9,900	9,723	9,731	9,250	5,408	6,476	6,881	6,559	6,664
	Total AC Stays	11,263	9,593	9,435	9,412	8,976	5,272	6,336	6,716	6,395	6,500
	Total AC Episodes	10,787	9,133	9,034	8,988	8,568	5,079	6,143	6,486	6,166	6,283
	Total AC Days	50,167	43,313	43,204	42,340	41,350	21,502	24,410	27,050	25,588	24,743
	Average Acute Care Admissions (Admissions Excluding Day Care)	1.16	1.16	1.16	1.16	1.15	1.13	1.11	1.13	1.12	1.12
	Average Acute Care Admissions Excluding Transfers	1.12	1.13	1.12	1.12	1.12	1.10	1.09	1.10	1.09	1.09
	Average Acute Care Episodes (Readmissions Combined with Admission)	1.07	1.07	1.08	1.07	1.07	1.06	1.06	1.06	1.06	1.05
	Average Length of stay per regular admission	4.31	4.38	4.44	4.35	4.47	3.98	3.77	3.93	3.90	3.71
	Average Length of stay per hospital stay	4.45	4.52	4.58	4.50	4.61	4.08	3.85	4.03	4.00	3.81
	Average Length of stay per hospital episode	4.65	4.74	4.78	4.71	4.83	4.23	3.97	4.17	4.15	3.94

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

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

Resource Utilization Band 4

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
	Patients with AC Stays	10,470	9,407	9,275	9,486	9,571	3,969	5,149	5,514	5,628	5,707
	Total AC Admissions	14,067	12,508	12,405	12,620	12,717	5,150	6,510	7,035	7,201	7,277
	Total AC Stays	13,115	11,676	11,614	11,807	11,919	4,839	6,176	6,670	6,789	6,897
	Total AC Episodes	11,932	10,636	10,527	10,784	10,847	4,474	5,749	6,170	6,289	6,406
	Total AC Days	77,253	66,386	66,011	68,534	68,832	27,371	32,890	36,664	36,457	36,946
	Average Acute Care Admissions (Admissions Excluding Day Care)	1.34	1.33	1.34	1.33	1.33	1.30	1.26	1.28	1.28	1.28
	Average Acute Care Admissions Excluding Transfers	1.25	1.24	1.25	1.24	1.25	1.22	1.20	1.21	1.21	1.21
	Average Acute Care Episodes (Readmissions Combined with Admission)	1.14	1.13	1.13	1.14	1.13	1.13	1.12	1.12	1.12	1.12
	Average Length of stay per regular admission	5.49	5.31	5.32	5.43	5.41	5.31	5.05	5.21	5.06	5.08
	Average Length of stay per hospital stay	5.89	5.69	5.68	5.80	5.77	5.66	5.33	5.50	5.37	5.36
	Average Length of stay per hospital episode	6.47	6.24	6.27	6.36	6.35	6.12	5.72	5.94	5.80	5.77

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

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

Resource Utilization Band 5

Averages		Hypertension Incentive									
		No					Yes				
		Year					Year				
		200607	200708	200809	200910	201011	200607	200708	200809	200910	201011
	Patients with AC Stays	8,116	7,923	7,811	8,443	8,883	3,037	4,620	4,894	5,166	5,794
	Total AC Admissions	14,318	14,008	13,766	14,865	15,613	4,997	7,354	7,831	8,178	9,247
	Total AC Stays	12,814	12,590	12,355	13,405	14,055	4,531	6,748	7,134	7,446	8,427
	Total AC Episodes	10,746	10,549	10,367	11,150	11,820	3,850	5,822	6,152	6,460	7,298
	Total AC Days	117,612	112,130	111,564	118,924	128,310	37,739	54,151	59,370	62,098	70,853
	Average Acute Care Admissions (Admissions Excluding Day Care)	1.76	1.77	1.76	1.76	1.76	1.65	1.59	1.60	1.58	1.60
	Average Acute Care Admissions Excluding Transfers	1.58	1.59	1.58	1.59	1.58	1.49	1.46	1.46	1.44	1.45
	Average Acute Care Episodes (Readmissions Combined with Admission)	1.32	1.33	1.33	1.32	1.33	1.27	1.26	1.26	1.25	1.26
	Average Length of stay per regular admission	8.21	8.00	8.10	8.00	8.22	7.55	7.36	7.58	7.59	7.66
	Average Length of stay per hospital stay	9.18	8.91	9.03	8.87	9.13	8.33	8.02	8.32	8.34	8.41
	Average Length of stay per hospital episode	10.94	10.63	10.76	10.67	10.86	9.80	9.30	9.65	9.61	9.71

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

5. ADJUSTED COST UTILIZATION AND HOSPITAL DATA

To summarize, Tables 17 and 18 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 \$3,644 and \$2,941, respectively.

When one adjusts for differences in the distribution of age, gender and RUB levels, annual costs are still lower for patients who received incentive based care, compared to those who did not. Table 19 presents data on comparative costs by RUB level. For RUBs 3, 4 and 5 the annual costs for patients who received incentive based care were lower than for patients who did not. Essentially, all of the savings are in hospital costs.

Table 20 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 \$3,522, while it was \$3,048 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 21 and, overall, in Table 22. 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, and the 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 23 and 24 present comparative, average, annual, adjusted, total costs by RUB and shows that total costs were lower for patients who received incentive based care for RUBs 3, 4 and 5, and overall. The annual costs for patients who received incentive based care were \$3,135 compared to \$3,443 for those who did not. Table 25 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 hypertension 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 hypertension incentive resulted in a cost avoidance of \$50.3 million (see Table 26). The overall costs of the incentive payments were fully recovered through efficiencies, and there was an additional cost avoidance, over and above the costs of the incentives of \$50.3 million.

Table 17: Number of Patients with Hypertension Who Did, and Did Not, Receive Incentive Based Care (April 2010 to March 2011)

Averages for 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	189,670	136,961	36,642	16,067	172,794	133,135	27,883	11,776
Client Age Group								
0 - 44	18,834	14,387	3,728	719	7,728	6,569	994	165
45 - 59	54,292	42,894	8,292	3,106	43,440	37,036	4,898	1,506
60 - 69	49,325	36,983	8,714	3,628	48,194	38,999	6,744	2,451
70 - 79	39,070	26,385	8,519	4,166	43,258	31,564	8,099	3,595
80 and over	28,149	16,312	7,389	4,448	30,174	18,967	7,148	4,059
Gender								
Females	109,156	80,574	20,757	7,825	99,416	77,664	15,703	6,049
Males	80,514	56,387	15,885	8,242	73,378	55,471	12,180	5,727
Attachment to Practice								
1. Less than 40%	7,132	3,967	1,908	1,257	2,781	1,598	677	506
2. 40% - 59%	30,519	19,970	6,848	3,701	18,274	12,554	3,654	2,066
3. 60% - 79%	43,056	29,389	9,142	4,525	33,977	24,301	6,490	3,186
4. 80% - 89%	36,403	27,003	6,718	2,682	34,483	26,660	5,469	2,354
5. 90% or More	72,560	56,632	12,026	3,902	83,279	68,022	11,593	3,664

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

Table 18: Total Cost of Hypertension for Patients Who Did, and Did Not, Receive Incentive Based Care (April 2010 to March 2011)

Averages for Hypertension	Incentive							
	No				Yes			
	Total Costs				Total Costs			
	All	Resource Utilization Band			All	Resource Utilization Band		
3		4	5	3		4	5	
All	3,644	1,896	5,476	14,366	2,941	1,754	4,834	11,873
Client Age Group								
0 - 44	2,854	1,422	5,945	15,473	1,878	1,167	4,989	11,415
45 - 59	2,771	1,539	4,973	13,895	2,040	1,342	4,289	11,906
60 - 69	3,374	1,859	5,153	14,549	2,569	1,624	4,645	11,892
70 - 79	4,305	2,303	5,613	14,305	3,434	2,112	4,880	11,788
80 and over	5,413	2,678	6,027	14,425	4,394	2,432	5,313	11,944
Gender								
Females	3,499	1,928	5,591	14,121	2,955	1,828	5,062	11,956
Males	3,841	1,850	5,326	14,599	2,921	1,651	4,540	11,786
Attachment to Practice								
1. Less than 40%	7,800	2,803	8,235	22,912	7,712	2,958	8,494	21,676
2. 40% - 59%	5,298	2,275	6,863	18,714	4,838	2,265	6,727	17,132
3. 60% - 79%	4,263	2,106	5,978	14,805	3,767	2,037	5,581	13,265
4. 80% - 89%	3,194	1,815	5,122	12,256	2,809	1,732	4,699	10,617
5. 90% or More	2,398	1,629	4,065	8,432	2,082	1,539	3,669	7,151

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

Table 19: Annual Costs for Hypertension Adjusted for Gender and Age Group within RUB (April 2010 to March 2011)

	Resource Utilization Band					
	3		4		5	
	Hypertension Incentive		Hypertension Incentive		Hypertension Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Amount	380	407	662	708	1,037	1,052
Specialist Amount	294	251	785	704	1,648	1,442
Diag Fac Amount	299	277	568	539	820	777
GP Specialist and Diag Fac Amounts	973	936	2,014	1,951	3,505	3,270
Hospital Costs	595	437	2,686	2,099	9,658	7,544
Pharmacy Costs	365	344	792	764	1,197	1,055
Total Cost	1,934	1,716	5,492	4,814	14,360	11,869
Attachment to Practice	80.60	84.97	76.38	80.36	71.64	75.92
Attachment to Practice, Excluding Incentives	80.50	82.92	76.10	78.38	71.22	73.98

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

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

	Hypertension Incentive	
	No Incentive	Incentive
GP Amount	480	510
Specialist Amount	486	423
Diag Fac Amount	387	362
GP Specialist and Diag Fac Amounts	1,353	1,296
Hospital Costs	1,663	1,278
Pharmacy Costs	505	473
Total Cost	3,522	3,048
Attachment to Practice	79.16	83.46
Attachment to Practice, Excluding Incentives	79.00	81.43

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

Table 21: Service Rates for Hypertension Adjusted for Gender and Age Group within RUB (April 2010 to March 2011)

	Resource Utilization Band					
	3		4		5	
	Hypertension Incentive		Hypertension Incentive		Hypertension Incentive	
	No Incentive	Incentive	No Incentive	Incentive	No Incentive	Incentive
GP Services	10.1	10.3	16.1	16.5	24.2	23.4
Specialist Services	3.9	3.4	10.0	9.0	20.6	17.9
Diag Fac Service	21.5	21.3	36.5	36.0	51.6	49.5
GP Specialist and Diag Fac Services	35.6	35.0	62.6	61.5	96.4	90.7
Hospital Days per 1000 Patients	495.3	347.5	2,241.6	1,672.6	8,575.6	6,436.5
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	254.5	216.8	699.3	618.5	1,498.0	1,286.8
Hospital Day Care Days per 1000 Patients	185.7	167.7	359.8	351.9	532.0	498.0
Hospital Transfers per 1000 Patients	2.1	1.2	21.8	13.7	96.6	71.4
Net Admissions per 1000 Patients (excluding Transfers and Day Care)	66.7	47.9	317.7	252.9	869.4	717.4
Readmission Within 7 days per 1000 net Admissions	19.7	16.0	40.7	38.7	65.2	60.8
Readmission Within 15 days per 1000 net Admissions	31.3	23.8	62.9	53.2	105.2	95.6
Readmission Within 30 days per 1000 net Admissions	44.5	33.6	86.6	74.2	156.1	136.3
Average Length of stay per regular admission	4.5	3.7	5.5	5.0	8.3	7.5
Average Length of stay per hospital stay	4.6	3.8	5.9	5.2	9.3	8.3
Average Length of stay per hospital stay episode	4.9	3.9	6.5	5.6	11.0	9.6

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

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

	Hypertension Incentive	
	No Incentive	Incentive
Attachment to Practice	79.2	83.5
Attachment to Practice, Excluding Incentives	79.0	81.4
GP Services	12.3	12.4
Specialist Services	6.2	5.5
Diag Fac Service	26.5	26.1
GP Specialist and Diag Fac Services	45.0	44.0
Hospital Days per 1000 Patients	1,426.8	1,051.1
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	429.2	370.5
Hospital Day Care Days per 1000 Patients	243.3	225.9
Hospital Transfers per 1000 Patients	12.8	8.8
Net Admissions per 1000 Patients (excluding Tranfers and Day Care)	173.0	135.8
Readmission Within 7 days per 1000 net Admissions	44.1	41.7
Readmission Within 15 days per 1000 net Admissions	70.1	62.7
Readmission Within 30 days per 1000 net Admissions	101.4	88.8
Average Length of stay per regular admission	6.4	5.7
Average Length of stay per hospital stay	6.8	6.1
Average Length of stay per hospital stay episode	7.6	6.7

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

Table 23: Annual Costs for Hypertension Adjusted by Gender, Age Group and Attachment within RUB (April 2010 to March 2011)

Average Total Costs			Hypertension Incentive	
			No Incentive	Incentive
Resource Utilization Band				
3			1,897	1,752
4			5,380	4,944
5			13,960	12,355

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

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

	Hypertension Incentive	
	No Incentive	Incentive
GP Amount	475	517
Specialist Amount	478	432
Diag Fac Amount	386	364
GP Specialist and Diag Fac Amounts	1,339	1,313
Hospital Costs	1,597	1,349
Pharmacy Costs	507	472
Average Total Cost	3,443	3,135

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

Table 25: Service Rates for Hypertension Adjusted by RUB, Attachment, Gender, and Age Group (April 2010 to March 2011)

	Hypertension Incentive	
	No Incentive	Incentive
Attachment to Practice	81.0	81.4
GP Services	12.2	12.6
Specialist Services	6.2	5.6
Diag Fac Service	26.5	26.1
GP Specialist and Diag Fac Services	44.9	44.3
Hospital Days per 1000 Patients	1,368.3	1,111.1
Hospital Admissions Incl Transfers and Day Care per 1000 Patients	418.0	382.9
Hospital Day Care Days per 1000 Patients	240.3	229.5
Hospital Transfers per 1000 Patients	12.0	9.7
Net Admissions per 1000 Patients (excluding Tranfers and Day Care)	165.7	143.6
Readmission Within 7 days per 1000 net Admissions	43.6	43.0
Readmission Within 15 days per 1000 net Admissions	69.4	64.6
Readmission Within 30 days per 1000 net Admissions	100.2	91.5
Average Length of stay per regular admission	6.3	5.7
Average Length of stay per hospital stay	6.8	6.1
Average Length of stay per hospital stay episode	7.6	6.8

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

Table 26: Summary of Hypertension Incentive Cost Avoidance Adjusted for RUB, Attachment, Gender and Age Group (April 2010 to March 2011)

Total Cost Per Person With Incentives	3,135
Total Cost Per Person With Incentives Excluding Incentive Amount(\$50)	3,085
Total Cost Per Person Without Incentives	3,443
Savings/Cost Per Person With Incentives Excluding Incentive Amount	358
Total Dollar Savings/Cost Using Standardized Rates Excluding Incentives	61,860,252
Cost of Incentives	-11,525,650
Total Dollar Savings/Cost	50,334,602

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

6. 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 hypertension incentive to also receive incentive payments for other conditions. For example, a hypertension patient who did not receive care using a hypertensive incentive may nevertheless have received an incentive for COPD. Also, a patient who received a hypertension 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 27 shows this complexity, excluding diabetes (patients can not receive care from a diabetes and a hypertension incentive). In Table 27 one can see that there were 172,794 patients who received care from a hypertension incentive payment. Of these patients some 19,939 also received care from one or more other incentive payments. Similarly, of the 189,670 hypertension patients who did not receive care using a diabetes incentive, some 14,245, nevertheless, received care from incentive payments for other conditions. Please note that people could have combinations of Complex Care (which includes almost all CHF patients) and COPD, that is why these columns do not add up to the column marked any other CD Incentive.

Having noted the above, our analysis still constitutes an analysis of hypertension patients who did, and did not, receive a hypertension incentive. However, given this complexity we also conducted analyses of patients who only had hypertension *per se*. Tables 28 and 29 show the unadjusted data and indicate that the average annual cost was \$2,534 for patients who had care from a hypertension incentive and \$3,098 from those who did not. Table 30 shows the comparative costs once one adjusts for age, gender and RUB level and Table 31 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 hypertension patients and patients who only had hypertension and no other condition. For example, our main analysis indicated that people who had incentive based care cost \$3,135 per year compared to those who did not who cost \$3,443, a cost differential of \$308 (see Table 24). For patients who only had hypertension the comparative costs were \$2,675 and \$2,944, a differential of \$269 (see Table 31). 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 hypertension patients and patients who only had hypertension.

Table 27: Incentive Count for Hypertension Patients (April 2010 to March 2011)

	No of Patients	Patients With		
		Any Other CD Incentive	Complex Care Incentive	COPD Incentive
Hypertension Incentive				
No Incentive	189,670	14,245	11,522	4,612
Incentive	172,794	19,939	16,276	6,601
All	362,464	34,184	27,798	11,213

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

Table 28: Number of Hypertension Patients Who Did, and Did Not, Receive Incentive Based Care Excluding all Patients with Complex Care, Diabetes, CHF and COPD (April 2010 to March 2011)

Averages for Hypertension	Incentive							
	No				Yes			
	All	Number of Patients Resource Utilization Band			All	Number of Patients Resource Utilization Band		
		3	4	5		3	4	5
All	155,136	118,904	26,413	9,819	142,480	115,360	19,833	7,287
Client Age Group								
0 - 44	18,469	14,217	3,605	647	7,564	6,472	947	145
45 - 59	48,981	40,072	6,723	2,186	39,855	34,724	4,049	1,082
60 - 69	39,972	31,697	6,101	2,174	40,375	33,958	4,870	1,547
70 - 79	28,593	20,855	5,408	2,330	32,991	25,576	5,341	2,074
80 and over	19,121	12,063	4,576	2,482	21,695	14,630	4,626	2,439
Gender								
Females	93,523	72,103	16,175	5,245	84,663	68,850	11,776	4,037
Males	61,613	46,801	10,238	4,574	57,817	46,510	8,057	3,250
Attachment to Practice								
1. Less than 40%	5,864	3,553	1,516	795	2,224	1,414	512	298
2. 40% - 59%	25,073	17,719	5,101	2,253	15,048	11,064	2,708	1,276
3. 60% - 79%	35,013	25,697	6,617	2,699	27,882	21,209	4,666	2,007
4. 80% - 89%	29,809	23,402	4,749	1,658	28,475	23,125	3,911	1,439
5. 90% or More	59,377	48,533	8,430	2,414	68,851	58,548	8,036	2,267

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

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

Averages for Hypertension	Incentive								
	No					Yes			
	Total Costs					Total Costs			
	All	Resource Utilization Band				All	Resource Utilization Band		
3		4	5	3	4		5		
All	3,098	1,785	5,133	13,515	2,534	1,644	4,515	11,223	
Client Age Group									
0 - 44	2,739	1,405	5,824	14,849	1,802	1,156	4,856	10,669	
45 - 59	2,410	1,488	4,521	12,829	1,833	1,307	3,944	10,830	
60 - 69	2,872	1,775	4,823	13,385	2,261	1,553	4,318	11,310	
70 - 79	3,680	2,183	5,223	13,497	2,977	1,975	4,620	11,099	
80 and over	4,807	2,561	5,795	13,901	3,910	2,294	5,030	11,481	
Gender									
Females	3,067	1,824	5,297	13,276	2,599	1,717	4,749	11,369	
Males	3,145	1,726	4,874	13,788	2,438	1,536	4,172	11,042	
Attachment to Practice									
1. Less than 40%	6,519	2,676	7,514	21,792	6,029	2,798	7,258	19,249	
2. 40% - 59%	4,401	2,162	6,339	17,629	4,033	2,133	6,107	16,111	
3. 60% - 79%	3,568	1,977	5,607	13,711	3,246	1,919	5,282	12,532	
4. 80% - 89%	2,733	1,697	4,767	11,532	2,436	1,617	4,271	10,622	
5. 90% or More	2,115	1,524	3,808	8,092	1,845	1,435	3,477	6,639	

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

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

	Hypertension Incentive	
	No Incentive	Incentive
GP Amount	442	468
Specialist Amount	442	383
Diag Fac Amount	354	333
GP Specialist and Diag Fac Amounts	1,238	1,185
Hospital Costs	1,362	1,037
Pharmacy Costs	410	388
Total Cost	3,009	2,610
Attachment to Practice	79.17	83.52
Attachment to Practice, Excluding Incentives	79.08	81.51

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

Table 31: Summary of Hypertension Incentives for Patients Who Did, and Did Not, Receive Incentive Based Care Excluding all Patients with Complex Care, Diabetes, CHF and COPD (April 2010 to March 2011)

	Hypertension Incentive	
	No Incentive	Incentive
GP Amount	437	475
Specialist Amount	435	389
Diag Fac Amount	353	335
GP Specialist and Diag Fac Amounts	1,226	1,199
Hospital Costs	1,307	1,089
Pharmacy Costs	411	386
Average Total Cost	2,944	2,675

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