

Report

Extended Healthcare and Dental Experience: A Report on a Post-employment Benefits Experience Study

Group Life and Health Subcommittee
of the CIA Research Committee

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Table of Contents

1. Introduction	3
2. Overview of Data Submitted.....	3
3. Data Adjustments.....	5
4. Extended Health Experience – 2007–09	9
5. Dental Experience – 2007–09	10
6. Experience Variation by Region	11
7. Variation in EHC Claims by HO versus ASO Administration	12
8. Experience by Employee’s Gender	14
9. Analysis of Annual EHC Claims by Size	16
10. Analysis of Drug Claims by Province	18
11. Private versus Publicly-Insured Plans – Drugs	19
12. Trends in Incidence and Average Claims	20
13. Graduation	23
14. Other Reports.....	24
15. Caveats.....	24
16. Conclusion and Recommendations.....	25
Appendix A.....	26
Appendix B	31
Appendix C.....	34

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1. Introduction

This report covers the first-ever group health and dental insurance claims experience study in Canada. The primary focus is the experience for employees aged 50+ to assist actuaries in valuing post-employment benefits. The Canadian Institute of Actuaries (CIA), through its Group Life and Health Subcommittee of the Research Committee, requested this study. Have Associates, together with Denis Garand Associates, have been engaged by the CIA to complete the study.

Initial discussions with insurers regarding available data took place during the summer of 2010. We were pleased with their response and in September 2010, detail data requests went out to Canadian group insurers, with ten insurers indicating they would participate; their data submissions were completed by June 2011. See appendix A for copy of the request for data.

By early October 2011, an initial review of the experience was completed and each insurer received an Excel pivot table such that they could review their own experience and compare that with “All Other Insurers” experience as a group. Insurers reviewed their results and a number of data changes were made. All insurers had reviewed their results by May 2012.

In 2015, prior to the publication of the experience report, it was decided to make the report more useful to actuaries in valuing post-employment benefits by also including graduated tables in the report.

The aim of this report is to provide the following:

- An analysis of the Canadian group health and dental claims experience;
- Assessment of claim cost trends for the experience period; and
- Graduated tables of the experience.

While this study provides some information on the claims experience for employees aged 50+, annual group health and dental claims costs can vary significantly from one employer plan to another.

It is recommended that future studies be conducted to build on this research. In particular, further studies should consider the large variety of drug plans in use across Canada and the impact of this on claims costs and provincial drug plan offsets.

This report contains a number of summary tables. Additional [ungraduated experience tables](#) and [graduated tables](#) are provided in separate Excel spreadsheets.

2. Overview of Data Submitted

Ten insurers provided group health (EHC) and dental claims data with seven insurers also providing exposure information.

Participating insurers who contributed data were the following:

- Empire Life Insurance;
- Equitable Life Insurance;
- Industrial Alliance Insurance;

- La Capitale Insurance;
- Manulife;
- Pacific Blue Cross;
- SSQ Life Insurance;
- Standard Life Assurance;
- Sun Life Assurance; and
- Wawanesa Life Insurance.

Exposure was mainly provided for Head Office (HO) billed business whereas claims information was provided for HO-billed, self-billed and administrative services only (ASO) business. For this study, the self-billed business is included with the ASO business. Some insurers were able to provide only claims information.

The data requests focussed on eligible claims (before application of deductibles, maximums, and co-insurances) by the major group health and dental benefit components. It did not include requests for details on the various internal deductibles, co-insurances and maximums—the inclusion of which would have generated too much data to manage, and, we believe, would have prevented most insurers from participating. See appendix A for details of the request for data.

Insurers were asked to exclude data related to the following:

- Affinity type groups; and
- Health spending account business.

The data includes group health and dental experience starting at employees aged 50. While information was requested on status of employment (active, disabled, or retired), this field was not well-populated. Hence, it was not possible to analyse differences in experience by employment status.

In total, 12.0 million claim records and 3.6 million exposure records were submitted consisting of the following:

- \$12.4 billion EHC claims;
- \$3.5 billion dental claims;
- 3.4 million exposure years for EHC; and
- 2.1 million exposure years for dental.

3. Data Adjustments

Some insurers were unable to provide coverage information. For those, only information related to groups with 100 or more employees were kept, and plan code information was derived by reviewing the types of claims submitted for each group.

EHC plan codes were established as a combination of drug plan type, vision, and O/S Canada. (e.g., DB_VC means direct brand name drugs with vision and O/S Canada coverage).

Where information regarding the drug plan was partly or completely missing, an X was substituted (e.g., DX_VC). Some plans have only the drug component and some only the O/S Canada benefits. See Appendix A: Request for Data for more details.

No plan code information was requested for hospital, paramedical, medical supplies, nursing, and other miscellaneous benefits since some insurers were not able to provide this detail readily; it was assumed that plans with drugs, vision, and O/S Canada coverage most likely also included those benefits.

Only plan codes with at least 500 claims were retained.

Some data records were excluded as follows:

- Ages below 50;
- Missing information such as province; and
- Records with matching exposure and claim data records if the gender and/or single/family coverage indicators was missing. Such data was still used for claims-only data since claims data includes an employee/dependent claim indicator; hence, don't need the single/family indicator. The employee gender information was used only for two tables with matching exposures.

While data for years 2005–09 was requested, four insurers, including two large insurers, did not provide data for 2005–06. Initial analysis of the 2005–06 experience revealed that it did not align with the 2007–09 experience, and the 2005–06 experience for some regions may have represented only one insurer; hence, this study only uses the more recent 2007–09 data.

To avoid undue influence and distortion of the final results by any one insurer, their unique products, administrative practices, and target markets for any given region, all data was adjusted by applying the same insurer/regional factor to both the insurer's exposures and claims. Factors vary from .02 to 1.00 depending on insurer/region combination. After applying these factors, no insurer contributes more than 40 percent of the data by claim count for any one region (BC, Alberta, Prairies, Ontario, Québec, and East).

All numbers, except as indicated, are after insurer/regional adjustment factors.

Age of the employee is calendar age – determined as year of experience less year of birth.

While the dependent claim information submitted sometimes included claim information for each dependent, this data was aggregated to just one dependent claim per calendar year per employee with family coverage.

Age and gender as used in this report refer to the employee’s age and gender for both the employee and dependent records. No information as to dependents’ age(s) or gender were requested or submitted.

Eligible claim amounts are determined before the application of maximums, co-insurances, and deductibles. However, for most insurers, the eligible claims amounts were determined by simply adding back the co-insurance and deductibles; hence, results may sometimes understate the actual claim amounts in absence of overall or inside maximums. This is a normal practice, since claims submitted frequently include bills for items not covered by the EHC or dental plan (e.g., non-eligible items bought at a pharmacy but submitted by insured employees on their claim forms along with eligible items).

All tables and results in this report are presented before any graduation; hence, results at older ages, where there may be limited exposure for some regions and benefits, should be used with caution. Section 13 discusses the development of separate graduated tables.

A summary of the actual exposure and claims information used for 2007–09, is shown below before and after application of insurer/regional adjustment factors.

Exposure and Claim Information Before and After Insurer/Regional Adjustment for 2007-09								
EHC Exposure Years			EHC Claims with Exposure			All EHC Claims		
	Before	After		Before	After		Before	After
Full Plans	1,676,972	167,830	Full Plans	2,102,582,271	235,670,187	Full Plans	4,095,445,120	597,112,127
Other	685,467	147,324	Other	701,243,705	177,557,732	Other	4,458,688,084	521,287,735
Total	2,459,386	350,766	Total	2,924,008,237	456,540,728	Total	8,714,995,816	1,166,057,506
Dental Exposure Years			Dental Claims with Exposure			All Dental Claims		
	Before	After		Before	After		Before	After
All Plans	1,075,271	195,932	All Plans	511,700,590	112,051,985	All Plans	2,100,886,277	350,587,483

Do the Insurer/Regional Factors Affect the Results?

Yes, by lessening the impact of any individual insurer, their specific product designs, administrative practices (e.g., drug plan), and target markets.

See below for comparison of the results before and after for full EHC plans with matching exposure. Note that the age 80+ results may represent less than credible number of claims.

Comparison of Annual Cost for Full EHC Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	741	645	493	618	462	598	742	833	1,063	1,028	641	987	816	872
50-59	662	553	459	591	410	530	675	767	1,058	991	573	931	762	816
60-64	788	716	605	729	565	734	912	1,053	1,552	1,383	794	1,186	1,015	1,116
65-69	853	834	526	598	522	651	770	812	711	856	850	1,059	795	833
70-79	871	870	548	580	882	1,232	886	810	494	630	758	983	778	739
80+	788	816	1,238	768	950	1,240	1,048	1,011	527	677	993	700	772	798
Dependent	593	536	395	558	351	550	543	735	968	1,006	508	822	648	780
50-59	515	470	354	549	309	515	487	692	970	964	439	769	594	737
60-64	643	601	536	579	434	572	689	871	1,358	1,367	701	935	801	968
65-69	726	706	494	556	443	710	625	820	556	757	615	1,056	664	761
70-79	778	766	563	782	660	837	683	684	357	536	934	950	688	657
80+	786	785	464	397	1,226	1,657	722	799	430	820	947	953	743	810

The EE Age above refers to the insured employee's age for both the employee data and the dependent data.

Dependent includes all dependent members of a family as one unit. Hence, even if several dependent members of a family each had claims in a given year it only counts as one claim for that year with the claim amount equal to the total of the claims for all dependents of the family unit.

Comparison of Annual Cost for Full Dental Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	340	392	302	402	222	282	324	323	314	297	204	279	314	328
50-59	332	377	303	394	219	279	321	317	308	289	203	244	310	319
60-64	369	421	294	400	234	291	337	333	341	313	206	399	330	344
65-69	358	461	301	488	227	250	338	358	360	353	226	322	335	380
70-79	354	410	316	476	217	298	318	348	312	331	208	348	315	354
80+	227	294	338	545	189	408	254	274	180	197	148	583	230	261
Dependent	293	434	266	446	196	323	256	327	337	318	159	305	277	352
50-59	290	450	268	473	196	343	256	343	348	329	162	304	282	366
60-64	307	388	258	355	194	289	264	291	303	291	144	244	271	312
65-69	309	406	250	348	205	194	249	282	298	301	165	424	263	318
70-79	276	424	275	486	191	305	241	273	265	271	152	444	249	311
80+	197	237	181	320	151	118	216	280	130	179	199	100	191	224

See appendix B for all the before/after incidence rates, average claim size, and the annual claims costs.

Data Sets

One data set for exposures and two data sets for claims were developed:

- a) All claims were used to develop the three-year average annual claim size amounts.
- b) Only those claims with matching exposure were used to develop incidence rates.

Only those plans with full EHC plans (drug, vision, and O/S Canada) were used to develop the various EHC incidence rates since the EHC plan codes do not include details on other benefits like hospitals, etcetera as discussed previously.

This report will feature the use of both claim sets depending on the particular needs of the experience table. For example, only claim data with matching exposures were used for any tables showing experience by gender since the claims-only data is frequently missing the gender.

Annual claims costs were developed using either of two methods:

- a) Directly as claims/exact matching exposures (plan, age, gender, province, etc.); or
- b) Indirectly as incidence rate X average annual claim size.

Is there any difference in results using method (a) versus method (b)?

Yes, as expected, if one compares the experience for full EHC and dental plans there are some differences in the three-year average claims costs as follows:

	Employee	Dependent
EHC		
Exact matching exposure and claims	872	780
Combination incidence x average claim	873	807
Dental		
Exact matching exposure and claims	328	349
Combination incidence x average claim	361	376
SUM of (incidence x average claim) for each of basic, major, and ortho	362	364

The differences most likely reflect the richer benefits typically aligned with larger groups, most of which are ASO or self-billing for whom limited or no exposure information was provided.

4. Extended Health Experience – 2007–09

The table below provides an overview of the three-year average annual costs, for all regions combined, for full EHC plans.

Annual Incidence				Annual Cost per Employee - Full EHC Plans							
EE Age	Exposure	Num Claims	Incidence	Num Claims	All EHC	Drug	Hosp	Vision	Other	OsCan	
Employee	167,830	117,444	0.70	462,887	873	665	13	32	147	16	
50-54	60,605	41,236	0.68	170,494	732	544	5	34	143	7	
55-59	49,866	35,616	0.71	138,112	924	724	8	34	147	11	
60-64	32,985	24,497	0.74	92,725	1121	908	14	32	151	17	
65-69	12,416	8,636	0.70	31,776	852	609	24	27	156	35	
70-74	4,943	3,255	0.66	12,476	758	481	42	23	158	55	
75-79	3,280	2,056	0.63	8,699	790	485	69	16	144	75	
80-84	1,992	1,227	0.62	5,262	810	454	99	16	144	98	
85-89	1,122	622	0.55	2,454	749	399	136	13	140	62	
90+	621	299	0.48	891	640	254	139	8	190	49	
Dependent	114,528	72,587	0.63	284,441	807	616	12	36	131	13	
50-54	45,483	27,675	0.61	109,734	698	513	6	41	133	4	
55-59	35,061	22,427	0.64	85,386	832	648	9	36	129	10	
60-64	21,672	14,768	0.68	55,619	1001	807	15	32	127	20	
65-69	7,201	4,619	0.64	18,559	827	624	23	27	138	15	
70-74	2,523	1,537	0.61	7,188	723	498	35	22	131	37	
75-79	1,445	903	0.62	4,582	812	510	51	20	135	96	
80-84	742	441	0.59	2,361	753	455	88	18	116	76	
85-89	303	168	0.55	826	760	473	101	14	130	43	
90+	97	48	0.49	188	729	351	217	11	86	65	

The number of claims for the incidence rates are based on claims with exposure, while number of claims for the average annual claim size are based on all claims.

Annual costs per employee = annual incidence rate x average annual claim size

Age refers to the employee's age for both the employee and dependent claim incidence rates.

The dependent claim incidence rate refers only to those employees with family coverage.

The costs are eligible claims before application of deductibles, maximums, and co-insurances. In most situations, this means costs exceeding the maximums were not included since they were not considered eligible.

Some key observations from the above include the following:

- Relative flat, even slightly declining, incidence rates and annual costs by increasing age; and
- Reduction in annual drug costs above age 65 when the provincial plans cover many of the drugs.

5. Dental Experience – 2007–09

The table provides an overview of the three-year average annual costs for full dental plans.

Annual Incidence				Annual Cost per Employee - Full Dental Plans				
EE Age	Exposure	Num Claims	Incidence	Num Claims	All Dental	Basic	Major	Ortho
Employee	88,206	43,584	0.49	151,794	361	258	101	1
50-54	35,287	17,662	0.50	61,719	352	261	90	2
55-59	28,109	13,794	0.49	44,639	367	260	105	1
60-64	16,869	8,222	0.49	27,072	373	259	114	1
65-69	5,084	2,563	0.50	9,337	384	259	125	1
70-74	1,322	681	0.52	3,808	370	257	113	0
75-79	664	331	0.50	2,628	349	245	104	0
80-84	469	218	0.46	1,635	326	228	98	0
85-89	258	88	0.34	726	218	158	60	0
90+	143	25	0.18	230	102	76	26	0
Dependent	67,002	29,555	0.44	102,546	376	272	87	16
50-54	27,778	12,588	0.45	43,606	422	315	77	30
55-59	21,247	9,198	0.43	29,982	360	260	90	10
60-64	12,514	5,391	0.43	17,871	336	234	99	3
65-69	3,698	1,665	0.45	6,146	337	225	110	2
70-74	920	400	0.44	2,376	308	204	104	0
75-79	431	181	0.42	1,503	281	191	89	0
80-84	255	96	0.38	745	247	174	73	0
85-89	109	30	0.28	257	179	124	55	0
90+	51	5	0.11	61

For table construction, please refer to the comments for the EHC tables above.

Some key observations from the above include the following:

- Relatively flat, even decreasing, incidence rates and annual costs by increasing age; and
- Orthodontics is hardly used even though many groups continue such coverage for the retirees.

6. Experience Variation by Region

Average Annual Cost by Region - Full EHC Plans with Exposure - 2007-09							
EE Age	BC	AB	PRAIRIE	ON	QC	EAST	Total
Employee	645	618	598	833	1028	987	872
50-54	509	539	489	689	880	836	732
55-59	605	666	583	862	1125	1042	919
60-64	716	729	734	1053	1383	1186	1116
65-69	834	598	651	812	855	1059	833
70-74	872	548	1389	727	624	877	719
75-79	867	677	909	939	638	1149	768
80-84	849	849	1133	1069	741	.	848
85-89	824	.	.	1074	615	.	786
90+	695	.	.	739	574	.	661
Dependent	536	558	550	735	1005	821	780
50-54	458	487	487	641	864	819	679
55-59	486	643	551	757	1095	707	811
60-64	601	579	572	871	1367	935	968
65-69	706	556	710	820	757	1053	761
70-74	748	724	899	687	492	940	631
75-79	795	972	.	679	618	961	703
80-84	784	.	1250	678	588	.	704
85-89	856	.	.	862	1324	.	1015
90+	581	.	.	.	1080	.	985

Prairie includes Manitoba and Saskatchewan.

East includes the Atlantic provinces, Yukon, Northwest Territories (NWT), and Nunavut.

Average Annual Cost by Region - Full Dental Plans with Exposure - 2007-09							
EE Age	BC	AB	PRAIRIE	ON	QC	EAST	Total
Employee	392	402	282	323	296	278	328
50-54	364	408	268	310	288	249	315
55-59	393	373	294	326	290	238	325
60-64	421	400	291	333	312	393	344
65-69	461	488	250	358	353	322	380
70-74	457	538	331	340	346	331	371
75-79	303	225	205	364	304	366	319
80-84	406	637	535	310	255	1068	330
85-89	223	180	159	261	196	167	220
90+	106	1291	60	156	45	64	108
Dependent	434	446	323	327	312	302	349
50-54	485	506	370	365	338	385	388
55-59	407	426	309	315	296	191	332
60-64	388	355	289	291	289	244	312
65-69	406	348	194	282	300	424	318
70-74	506	578	247	253	264	559	322
75-79	214	146	528	314	281	335	287
80-84	264	574	136	297	253	126	274
85-89	182	5	65	294	114	62	182
90+	216	0	0	78	35	197	64

7. Variation in EHC Claims by HO versus ASO Administration

The table shows higher average claim size by ASO as expected, since ASO plans are typically associated with larger and sometimes richer plans. This is less pronounced for dependent coverage. The claims data set did not include many ASO claims, since many insurers do not always have exact details of employee ages in their files.

Average Annual Claim Size - HO vs ASO - 2007-09 Full EHC Plans

EE Age	HO		ASO		Both	
	# Claims	Avg Ann Claim	# Claims	Avg Ann Claim	# Claims	Avg Ann Claim
Employee	259,532	1,235	32,084	1,428	291,616	1,256
50-54	95,004	1,061	12,037	1,214	107,040	1,078
55-59	77,544	1,279	9,014	1,423	86,558	1,294
60-64	52,546	1,487	5,748	1,676	58,293	1,506
65-69	18,237	1,229	2,232	1,546	20,469	1,263
70-74	6,785	1,156	1,221	1,589	8,006	1,222
75-79	4,608	1,242	955	1,775	5,564	1,334
80-84	2,829	1,335	595	1,796	3,424	1,415
85-89	1,416	1,334	222	2,037	1,638	1,429
90+	562	1,313	61	2,297	623	1,409
Dependent	157,549	1,280	22,496	1,293	180,045	1,282
50-54	60,086	1,157	8,373	1,061	68,459	1,145
55-59	47,698	1,300	6,458	1,302	54,155	1,300
60-64	31,451	1,466	4,134	1,533	35,586	1,474
65-69	10,430	1,324	1,599	1,471	12,029	1,343
70-74	3,790	1,245	847	1,541	4,637	1,299
75-79	2,356	1,378	614	1,601	2,970	1,424
80-84	1,186	1,305	348	1,735	1,534	1,402
85-89	442	1,400	104	1,858	546	1,487
90+	110	1,479	20	1,532	129	1,487

Full Dental Plans

EE Age	HO		ASO		Both	
	# Claims	Avg Ann Claim	# Claims	Avg Ann Claim	# Claims	Avg Ann Claim
Employee	106,802	713	44,991	774	151,794	731
50-54	44,741	687	16,978	748	61,719	704
55-59	32,464	727	12,175	801	44,639	747
60-64	19,322	745	7,750	819	27,072	766
65-69	5,910	748	3,427	786	9,337	762
70-74	1,934	703	1,874	733	3,808	718
75-79	1,216	683	1,412	715	2,628	700
80-84	757	701	878	702	1,635	701
85-89	348	622	377	661	726	642
90+	110	529	120	612	230	572
Dependent	72,734	899	29,812	739	102,546	852
50-54	32,176	1,004	11,430	724	43,606	931
55-59	21,803	856	8,179	764	29,982	831
60-64	12,608	785	5,263	763	17,871	779
65-69	3,825	756	2,321	737	6,146	749
70-74	1,156	721	1,220	696	2,376	708
75-79	681	677	822	662	1,503	669
80-84	342	619	403	686	745	656
85-89	111	622	145	666	257	647
90+	32	600	29	550	61	576

8. Experience by Employee's Gender

The table below shows the variation in costs by employee gender for full EHC plans with exposure where gender is available from both the exposure and claims data.

Comparison of EHC Costs by Employee Gender - Full EHC Plans with Exposure						
Annual Cost by EE Gender - Male						
EE Age	Total EHC	Drugs	Hosp	Vision	OsCan	Other
Employee	814	647	15	28	16	109
50-59	749	599	9	29	8	104
60-64	1,038	870	17	28	16	108
65-69	799	582	29	25	32	131
70-79	765	498	42	20	67	137
80+	855	492	91	15	99	159
Dependent	775	587	13	38	7	130
50-59	739	552	9	42	4	132
60-64	915	740	14	33	8	120
65-69	763	557	18	29	18	141
70-79	663	461	27	24	20	131
80+	805	525	79	19	49	134
Annual Cost by EE Gender - Female						
EE Age	Total EHC	Drugs	Hosp	Vision	OsCan	Other
Employee	945	713	16	31	16	169
50-59	900	689	9	33	9	161
60-64	1,224	981	15	31	19	178
65-69	879	612	25	25	27	191
70-79	711	395	53	19	47	196
80+	757	388	110	13	54	192
Dependent	790	633	15	28	10	103
50-59	734	591	9	30	4	99
60-64	1,090	901	23	22	30	114
65-69	756	566	42	17	12	120
70-79	642	358	68	15	64	138
80+	833	480	180	17	1	155
Annual Cost - Male & Female Combined						
EE Age	Total EHC	Drugs	Hosp	Vision	OsCan	Other
Employee	872	676	16	29	16	136
50-59	816	639	9	31	9	129
60-64	1,116	916	17	29	17	137
65-69	833	595	27	25	30	157
70-79	739	448	47	20	58	166
80+	798	432	102	14	73	178
Dependent	780	603	14	35	8	121
50-59	737	567	9	38	4	119
60-64	968	788	17	29	15	118
65-69	761	559	25	26	16	135
70-79	657	432	39	21	32	133
80+	810	516	98	18	40	138
Ratio of Male / M & F Combined						
EE Age	Total EHC	Drugs	Hosp	Vision	OsCan	Other
Employee	0.93	0.96	0.96	0.95	1.01	0.80
50-59	0.92	0.94	1.01	0.94	0.97	0.80
60-64	0.93	0.95	1.05	0.96	0.92	0.78
65-69	0.96	0.98	1.06	1.01	1.08	0.84
70-79	1.04	1.11	0.88	1.01	1.17	0.83
80+	1.07	1.14	0.89	1.11	1.35	0.89
Dependent	0.99	0.97	0.92	1.11	0.84	1.08
50-59	1.00	0.97	1.01	1.12	0.97	1.11
60-64	0.95	0.94	0.84	1.11	0.54	1.02
65-69	1.00	1.00	0.74	1.13	1.11	1.04
70-79	1.01	1.07	0.70	1.11	0.61	0.99
80+	0.99	1.02	0.81	1.02	1.22	0.97
Ratio of Female / M & F Combined						
EE Age	Total EHC	Drugs	Hosp	Vision	OsCan	Other
Employee	1.08	1.05	1.05	1.06	0.99	1.24
50-59	1.10	1.08	0.99	1.08	1.04	1.24
60-64	1.10	1.07	0.93	1.06	1.11	1.30
65-69	1.05	1.03	0.92	0.99	0.89	1.22
70-79	0.96	0.88	1.12	0.98	0.82	1.18
80+	0.95	0.90	1.08	0.92	0.75	1.08
Dependent	1.01	1.05	1.14	0.81	1.28	0.86
50-59	1.00	1.04	0.99	0.81	1.06	0.83
60-64	1.13	1.14	1.36	0.75	2.07	0.96
65-69	0.99	1.01	1.67	0.67	0.71	0.89
70-79	0.98	0.83	1.75	0.72	1.99	1.03
80+	1.03	0.93	1.85	0.91	0.02	1.12

Even though the above data is not graduated, most of the ratios show smooth progression from age to age, with the dependent age 60–64 ratios deviating—perhaps due to the male spouse no longer working and insured under a group plan with loss of coordination of benefits offset. The data does not include spouse ages, but a review of Statistics Canada vital statistics for 2004 shows that male spouses are on average almost two years older than their female spouses.

The tables below show variation in costs by employee gender for full dental plans with exposure where that gender is available from both the exposure and claims data. While the Total columns below include ortho, too little data was available to allow for proper analysis separately by gender.

Comparison of Dental Costs by Employee Gender - Full Dental Plans with Exposure							
Annual Cost by EE Gender - Male				Annual Cost by EE Gender - Female			
EE Age	Total	Basic	Major	EE Age	Total	Basic	Major
Employee	310	234	76	Employee	357	259	98
50-59	300	232	68	50-59	347	257	90
60-64	324	236	88	60-64	387	269	118
65-69	351	246	106	65-69	467	282	185
70-79	348	247	101	70-79	371	251	120
80+	282	195	87	80+	231	161	71
Dependent	353	279	74	Dependent	320	249	71
50-59	370	301	69	50-59	325	258	68
60-64	314	231	83	60-64	298	221	77
65-69	321	225	96	65-69	296	192	104
70-79	306	210	95	70-79	339	176	163
80+	235	156	79	80+	147	104	42
Annual Cost by EE Gender - M & F Combined				Ratio of Male / M & F Combined			
EE Age	Total	Basic	Major	EE Age	Total	Basic	Major
Employee	327	243	84	Employee	0.95	0.96	0.90
50-59	319	242	77	50-59	0.94	0.96	0.89
60-64	343	246	98	60-64	0.94	0.96	0.91
65-69	380	255	125	65-69	0.92	0.97	0.84
70-79	354	248	106	70-79	0.98	1.00	0.95
80+	261	180	80	80+	1.08	1.08	1.09
Dependent	343	270	73	Dependent	1.03	1.03	1.01
50-59	355	287	68	50-59	1.04	1.05	1.01
60-64	310	229	82	60-64	1.01	1.01	1.02
65-69	317	220	97	65-69	1.01	1.02	0.99
70-79	311	205	106	70-79	0.98	1.03	0.90
80+	224	150	74	80+	1.05	1.04	1.06
Ratio of Female / M & F Combined							
EE Age	Total	Basic	Major				
Employee	1.09	1.07	1.17				
50-59	1.09	1.06	1.17				
60-64	1.13	1.09	1.21				
65-69	1.23	1.11	1.48				
70-79	1.05	1.01	1.13				
80+	0.89	0.89	0.88				
Dependent	0.93	0.92	0.97				
50-59	0.92	0.90	0.99				
60-64	0.96	0.96	0.95				
65-69	0.93	0.87	1.07				
70-79	1.09	0.86	1.53				
80+	0.65	0.70	0.57				

9. Analysis of Annual EHC Claims by Size

In this analysis, claim amounts are eligible claim amounts before applying insurer/regional adjustment factors.

For many insurers, eligible claims do not include amounts above the specific plan maximums; hence, the tables below may understate actual presence of large claims. For example, some plans may have a \$25,000 annual maximum per insured person whereas others may have \$1,000,000 lifetime maximums. No detailed information is available on specific plan maximums which will typically vary by group or even division.

The table below shows the split by claim size. For example, for 2009, 75.73 percent of eligible claim amounts were for claims less than \$5,000 and only .17 percent of claim amounts were for claims over \$250,000.

Full EHC Plans by Claim Size - % by Claim Amounts				
Claim Size	2007	2008	2009	All Yrs
\$0K - \$5K	79.23%	77.13%	75.73%	77.18%
\$5K - \$10K	10.37%	11.13%	11.65%	11.12%
\$10K - \$25K	6.90%	7.43%	7.76%	7.41%
\$25K - \$50K	2.34%	2.84%	3.15%	2.82%
\$50K - \$100K	0.58%	0.95%	1.11%	0.91%
\$100K - \$250K	0.41%	0.34%	0.44%	0.40%
\$250K +	0.17%	0.17%	0.17%	0.17%
All Claims	100.00%	100.00%	100.00%	100.00%

Size refers to the total annual claims for either an employee or a dependent claim. All dependents' claims, for any employee, are counted on the same dependent claim; however, most likely a large dependent claim is just related to one dependent. Employee and dependent claims are counted separately. For example, if one certificate has an employee claim of \$3,000 and a dependent claim of \$40,000, the \$3,000 employee claim would be counted in the \$0K-\$5K row, and the \$40,000 dependent claim would be counted in the \$25K-\$50K row.

In most categories above the \$5,000 annual claim size, the percentage of the claims exceeding the limit increases from one year to the next as expected, due to annual trends in costs.

Full EHC Plans by Claim Size - % by Claim Amount			
Claim Size	EE	Dep	EE + Dep
\$0K - \$5K	77.33%	76.93%	77.18%
\$5K - \$10K	10.92%	11.45%	11.12%
\$10K - \$25K	7.35%	7.51%	7.41%
\$25K - \$50K	2.84%	2.78%	2.82%
\$50K - \$100K	1.00%	0.76%	0.91%
\$100K - \$250K	0.42%	0.36%	0.40%
\$250K +	0.14%	0.21%	0.17%
All Claims	100.00%	100.00%	100.00%

Full EHC Plans by Claim Size and Employee Age - % by Claim Amount						
Claim Size	50-59	60-64	65-69	70-79	80+	All Ages
\$0K - \$5K	77.41%	75.55%	80.28%	78.57%	73.86%	77.18%
\$5K - \$10K	10.53%	12.54%	10.10%	10.95%	14.07%	11.12%
\$10K - \$25K	7.88%	7.31%	5.92%	5.90%	7.03%	7.41%
\$25K - \$50K	3.01%	2.83%	2.19%	2.17%	2.46%	2.82%
\$50K - \$100K	0.77%	1.04%	1.07%	1.08%	1.56%	0.91%
\$100K - \$250K	0.24%	0.56%	0.43%	0.77%	1.01%	0.40%
\$250K +	0.15%	0.18%	0.00%	0.55%	0.00%	0.17%
All Claims	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Full EHC Plans by Claim Size and Expense Type - % by Claim Amount								
Claim Size*	# Claims	Claim Amt	Drug	Hosp	Vis	OsCan	Other	All Claims
\$0K - \$5K	3,332,604	3,195,015,872	72.58%	1.44%	5.83%	0.31%	19.85%	100%
\$5K - \$10K	70,144	460,196,263	76.46%	4.75%	1.05%	1.31%	16.42%	100%
\$10K - \$25K	20,078	306,776,299	81.08%	5.51%	0.37%	3.69%	9.35%	100%
\$25K - \$50K	3,568	116,684,751	82.02%	3.56%	0.17%	9.57%	4.69%	100%
\$50K - \$100K	589	37,676,061	61.84%	1.62%	0.07%	31.91%	4.56%	100%
\$100K - \$250K	116	16,371,972	32.36%	0.16%	0.02%	58.97%	8.49%	100%
\$250K +	19	7,037,041	0.48%	1.32%	0.02%	84.00%	14.19%	100%
All Claims	3,427,118	4,139,758,259	73.53%	2.16%	4.65%	1.59%	18.07%	100%

* By total EHC claim size

The above table shows the split of EHC claims by type for each claim size. Up to the \$100,000 of annual claim size, drugs dominate as the main cause; however, for the 135 claims over \$100,000 there are the following:

- 38 drug claims up to \$230,000;
- 7 other benefit claims up to \$520,000 – mostly private duty nursing; and
- 81 out-of-Canada claims with 16 claims over \$250,000 – largest at \$663,000.

10. Analysis of Drug Claims by Province

It is expected that drug costs will vary by province due to a number of factors such as the following:

- Variation in the senior drug plans by province;
- Generic drug pricing regulations;
- Variation in drug plan usage due to differing standards of medical practice;
- Variation by socio-economic status of insured employees;
- Major employer types/industries; and
- Group plans' own specific drug formularies and plan designs.

Provincial Drug Coverage – 2007–09

All provinces had drug coverage for seniors age 65+ based on their specific provincial formularies; hence, not all prescriptions were covered by the provincial plan (e.g., new drugs or brand-name drugs if a generic version exists).

Most provinces had some deductibles.

British Columbia's and Manitoba's provincial drug plans also covered those under age 65. Some provinces also provided plans for children under age 14, for low income individuals, or for individuals with specific illnesses (e.g., cancer).

Most provinces were first payers with the privately insured plans covering the portion of drugs not covered by the provincial plan. However, where private coverage exists for seniors in the provinces of Nova Scotia, New Brunswick, Newfoundland, Yukon, NWT, and Nunavut, the provincial plans are second payer only covering items not covered by the private plan.

11. Private versus Publicly-Insured Plans – Drugs

Since drug claims are split public versus private, how does that split change as an employee ages? The table below shows that the proportion of out-of-hospital drug claims covered by the public plan increases significantly by age. Note the significant increase in the public component at age 65+ in Ontario.

Privately Insured - All Drug Plans with Exposure - Average Annual Costs 2007-09 for Employees (1)

EE Age	BC	AB	SK	MB	ON	QC	NB	NS	NL	Canada
50-54	329.82	392.68	327.26	325.33	511.29	711.95	825.24	515.15	728.22	559.95
55-59	428.81	512.81	512.33	406.37	669.55	941.30	1,167.76	578.39	634.80	734.63
60-64	538.58	556.72	552.85	575.16	860.82	1,161.39	1,188.41	992.25	672.03	916.22
65-69	638.45	460.10	546.44	461.39	584.51	582.12	872.53	678.71	966.91	594.49
70-74	690.77	*	*	*	421.48	298.32	*	*	*	440.48
75-79	684.32	*	*	*	475.90	298.74	*	*	*	459.19
80-84	661.36	*	*	*	541.05	307.40	*	*	*	482.95
85-89	627.12	*	*	*	371.79	267.18	*	*	*	423.38
90+	438.91	*	*	*	197.30	157.96	*	*	*	281.66

Publicly Insured Drug - Per Capita Average Annual Costs 2007-09 - Population (2)

EE Age	BC	AB	SK	MB	ON	QC	NB	NS	NL	Canada
50-54	200.56	213.03	242.26	276.33	193.96	233.34	169.38	204.17	234.18	210.96
55-59	232.02	298.19	303.04	341.19	226.14	322.06	189.47	224.41	277.44	263.36
60-64	292.50	473.70	416.60	428.36	275.77	485.22	210.29	225.95	328.62	355.22
65-69	414.25	1,016.93	806.30	555.36	1,175.47	909.85	554.58	929.44	573.29	919.20
70-74	626.24	1,267.70	947.43	714.57	1,591.11	1,147.12	820.48	1,217.75	854.49	1,222.04
75-79	770.20	1,386.55	1,043.70	820.13	1,846.78	1,342.23	990.46	1,420.39	1,010.08	1,420.22
80-84	812.93	1,436.76	1,101.16	875.67	2,087.65	1,459.18	1,087.65	1,493.57	1,133.35	1,562.65
85-89	818.34	1,356.55	1,075.77	828.59	2,322.43	1,445.49	1,103.61	1,463.15	1,136.84	1,626.02
90+	800.42	1,142.21	1,096.95	741.71	2,269.15	1,168.58	1,330.27	1,544.03	1,143.87	1,505.25

Privately + Publicly Insured Drug - Average Annual Costs 2007-09 for Employees

EE Age	BC	AB	SK	MB	ON	QC	NB	NS	NL	Canada	% Private
50-54	530.38	605.71	569.52	601.66	705.26	945.28	994.62	719.32	962.40	770.91	73%
55-59	660.82	811.00	815.37	747.56	895.69	1,263.36	1,357.23	802.80	912.24	997.99	74%
60-64	831.09	1,030.42	969.46	1,003.52	1,136.59	1,646.61	1,398.70	1,218.20	1,000.65	1,271.44	72%
65-69	1,052.70	1,477.03	1,352.75	1,016.75	1,759.98	1,491.97	1,427.10	1,608.14	1,540.20	1,513.69	39%
70-74	1,317.01	*	*	*	2,012.60	1,445.44	*	*	*	1,662.52	26%
75-79	1,454.52	*	*	*	2,322.68	1,640.97	*	*	*	1,879.41	24%
80-84	1,474.28	*	*	*	2,628.70	1,766.58	*	*	*	2,045.60	24%
85-89	1,445.46	*	*	*	2,694.22	1,712.67	*	*	*	2,049.41	21%
90+	1,239.33	*	*	*	2,466.45	1,326.55	*	*	*	1,786.91	16%

* Results not credible since limited exposure + claims

(1) Data did not provide dependent count nor their age(s) - hence only able to compare employees

(2) CIHI 2011 National Expenditure Report. All residents (employees+ dependents).
Does not include drugs dispensed in-hospital

12. Trends in Incidence and Average Claims

One of the primary purposes of this report is to analyse the data for any trends in incidence and average annual claim amounts. The next three pages illustrate some of the 2007–09 trends for full EHC and dental plans.

Annual Incidence Rates by Benefit													
Employee							Dependent						
Year	Drug	Hosp	Vis	OsCan	Other	All EHC	Year	Drug	Hosp	Vis	OsCan	Other	All EHC
2007	0.590	0.017	0.127	0.006	0.274	0.656	2007	0.528	0.014	0.133	0.004	0.229	0.587
2008	0.626	0.017	0.126	0.006	0.298	0.694	2008	0.564	0.015	0.135	0.005	0.255	0.628
2009	0.623	0.016	0.124	0.007	0.296	0.691	2009	0.562	0.014	0.130	0.005	0.256	0.625
Grand Total	0.615	0.017	0.126	0.006	0.290	0.682	Grand Total	0.553	0.014	0.133	0.004	0.248	0.615
Avg Ann Increase	1.6%	-1.0%	-1.4%	5.9%	2.5%	1.6%	Avg Ann Increase	2.0%	-0.1%	-2.0%	3.7%	3.8%	1.9%
Avg Annual Increase = Avg 2007-08 to 2009													
Average Annual EHC Claim Size by Benefit													
Employee							Dependent						
Year	Drug	Hosp	Vis	OsCan	Other	All EHC	Year	Drug	Hosp	Vis	OsCan	Other	All EHC
2007	1,002	712	233	2,814	472	1,188	2007	1,033	805	243	3,143	483	1,213
2008	1,050	750	248	2,152	484	1,251	2008	1,077	790	261	1,855	508	1,271
2009	1,093	775	253	2,777	512	1,308	2009	1,110	788	271	3,735	532	1,326
Grand Total	1,052	747	245	2,564	491	1,253	Grand Total	1,076	794	259	2,914	509	1,274
Avg Ann Increase	4.3%	4.0%	3.5%	7.7%	4.6%	4.8%	Avg Ann Increase	3.4%	-0.8%	5.1%	30.7%	4.8%	4.5%
Avg Annual Increase = Avg 2007-08 to 2009													
Combined Annual Increase 2007-09													
Avg Ann Increase	6.0%	3.0%	2.1%	14.1%	7.2%	6.4%	Avg Ann Increase	5.5%	-0.9%	2.9%	35.6%	8.8%	6.4%

For drug plans, the annual increase in average claim amount varied by drug plan type as shown below:

Average Annual Drug Claim by Drug Plan Type									
Employee					Dependent				
Year	DB	DG	RB	FB	Year	DB	DG	RB	FB
2007	979	1,010	1,102	1,122	2007	1,008	1,072	1,026	1,055
2008	1,078	1,059	1,142	1,258	2008	1,119	1,117	1,061	1,172
2009	1,145	1,097	1,191	1,262	2009	1,162	1,131	1,104	1,189
Grand Total	1,081	1,059	1,146	1,216	Grand Total	1,109	1,109	1,064	1,140
Avg Ann Increase	7.4%	4.0%	4.1%	4.0%	Avg Ann Increase	6.1%	2.2%	3.8%	4.5%
DB - Direct Brand		RB - Reimbursement Brand	Insufficient data available for analysis for 2 drug plans:						
DG - Direct Generic		FB - Deferred Brand	RG - Reimbursement Generic						
			FG - Deferred Generic						

A table combining those increases and comparing them to increases in public healthcare spending on a per capita basis is shown below.

Annual Increase in Per Capita Annual Claims Costs by Benefit - Public vs Privately Insured														
Employee*	Private						Public - CIHI per Capita **					Economic Data ***		
Year	Drug	Hosp	Vis	OsCan	Other	All	Drug	Hosp	Phys	OthProf	All	Inflation	RealGDP	PerCapita
2005-06							7.0%	3.7%	6.3%	na	5.7%	2.2%	2.7%	3.8%
2006-07							6.8%	6.4%	7.1%	na	5.5%	1.6%	2.1%	2.6%
2007-08							4.2%	4.5%	6.9%	11.0%	6.1%	2.4%	1.1%	2.4%
2008-09							4.9%	6.7%	8.8%	11.4%	6.8%	1.5%	-2.8%	-2.4%
2009-10							7.0%	5.1%	6.4%	7.8%	4.5%	1.4%	3.2%	3.5%
2010-11							-1.1%	6.3%	5.9%	2.2%	5.0%	2.1%	2.6%	3.6%
2011-12 Forecast							3.4%	1.9%	3.9%	6.4%	2.1%	1.2%	2.9%	3.0%
2012-13 Forecast							-1.5%	1.2%	1.3%	3.4%	1.5%	1.8%	2.0%	2.7%
Avg 2007-09	6.0%	3.0%	2.1%	14.1%	7.2%	6.4%	4.5%	5.6%	7.9%	11.2%	6.4%	1.9%	-0.9%	0.0%
Avg 2009-13							1.9%	3.6%	4.4%	4.9%	3.3%	1.6%	2.7%	3.2%

* Data did not provide dependent count nor their age(s) - hence only able to compare employees

** CIHI 2012 National Expenditure Report. All residents (employees+ dependents).
Drugs dispensed in-hospital are included in the hospital category

*** Bank of Canada: November Annual Core CPI Increases
RealGDP is annual change in total real GDP.
PerCapita is Inflation + real GDP less 1.1% average annual increase in the Canadian population
Canadian population per Stats Canada: 2008=33,317,700; 2012=34,880,500 or 1.1% increase per year

Note that the privately insured costs include only employees since the insurers' experience data set does not include exposure nor claims information regarding the actual number of covered dependents.

Key observations from the above table include the following:

- 2007–09 annual increase for all healthcare benefits at 6.4 percent for both private and public plans;
- 2007–09 increases for drugs higher for private at 6.0 percent and public at 4.5 percent;
- The real annual GDP growth per capita for 2007–09 period was zero but healthcare costs per capita after inflation still increased at 4.4 percent per annum; and
- Slowing of increases in public plan costs per capita beyond 2009. Possible reasons:
 - More generic drugs available and their repricing;
 - Economic downturn causing pressures on healthcare budget and fee increases;
 - or
 - Reduction in core inflation rate.

While we have no data beyond 2009 for private health coverage, it is expected that it was also influenced by the generic drug repricing and reduction in inflation rate.

Annual Increase - Dental Incidence Rate						
Employee			Dependent			
Year	Basic	Major	Year	Basic	Major	
2007	0.456	0.074	2007	0.423	0.062	
2008	0.479	0.078	2008	0.434	0.065	
2009	0.474	0.077	2009	0.428	0.063	
Grand Total	0.470	0.077	Grand Total	0.429	0.063	
Avg Ann Increase	0.9%	1.2%	Avg Ann Increase	-0.1%	-0.3%	
Avg Ann Increase = Avg 2007-08 to 2009						
Annual Increase - Average Annual Dental Claim Size						
Employee			Dependent			
Year	Basic	Major	Year	Basic	Major	
2007	495	1,165	2007	558	1,080	
2008	518	1,228	2008	594	1,193	
2009	538	1,224	2009	626	1,198	
Grand Total	518	1,207	Grand Total	595	1,163	
Avg Ann Increase	4.0%	1.5%	Avg Ann Increase	5.7%	3.6%	
Avg Ann Increase = Avg 2007-08 to 2009						
Combined Annual Increase 2007-09						
Avg Ann Increase	4.9%	2.8%	Avg Ann Increase	5.7%	3.3%	

The annual 2007–09 increase in total dental claims (approximately 5 percent) is less than total EHC claims at 6.4 percent.

Near Future Annual Trends for Private Post-employment Plans

For many years now, the cost of healthcare has increased faster than even the per capita growth in GDP. Essentially, we are spending any increased earnings plus some on healthcare, and there is no reason to expect this will change in the near future with new medical technology still evolving; hence, it appears useful to think of per capita annual increase in healthcare cost as the sum of three components:

$$\text{Core inflation rate} + \text{Increase in real per capita GDP} + \text{Increase in healthcare utilization}$$

13. Graduation

Graduation of the experience tables, for individual ages 50 to 90, was performed using an osculatory interpolation approach to achieve both maximum fit and smoothness. Exponential curves were fitted to grouped experience, at key pivotal points, and then interpolated for individual ages using divided differences assuming fourth differences are zero. This approach was judged to be appropriate since the exposures at older ages are just a very small fraction of that at younger ages.

With the senior provincial drug plans beginning at age 65, the tables for drug costs for employee ages < 65 and ages > 65 were developed and graduated separately.

The resulting graduated tables were adjusted to nearest age at start of experience period from calendar age at middle of the calendar year experience period. For example, age nearest 50 is on average equivalent to calendar age 50.5. Calendar ages were used to aggregate the data, since the month and day of some dates of birth were not always provided by the insurers.

Using the above method, separate tables for employee and dependent costs were developed as follows:

1. Drug costs (where sufficient data exists) split by province:
 - BC and Manitoba combined;
 - Alberta;
 - Saskatchewan;
 - Ontario;
 - Québec;
 - NB, NS, and NFLD combined; and
 - Total Canada.

2. Health benefits – total Canada:
 - Hospital;
 - Vision;
 - O/S Canada; and
 - Other health benefits (paramedical, medical supplies, nursing, etc.).

3. Dental Benefits – total Canada:
 - Total basic and major dental;
 - Basic dental; and
 - Major dental.

Once the graduated annual costs were developed, age factors were derived by setting age 65 costs = 1.00. Separate graduated adjustment factors for employee gender were also developed which can then be applied to these aggregate age factors.

Aging trend factors were also developed showing the change in annual claims cost by individual ages from age x to age $x+1$. Separate factors were derived for the observed value of the senior provincial drug plan offset at age 65 for each of the provincial categories above.

The graduated tables are provided in a separate Excel spreadsheet PE 2007–09 Graduated Tables.

14. Other Reports

PE 2007-09 Experience Tables

This Excel spreadsheet includes a number of ungraduated experience exhibits viewing the data from many perspectives.

The tables include both incidence and average claim amounts. Note that the average claim amounts represent all claims—not just those with exposure. The number of claims for each is shown in the tables.

The incidence and average claim amounts are then multiplied together to show the annual expected claims costs per insured employee split by employee and dependent.

Please note that unless stated all numbers are after insurer/regional adjustment factors.

15. Caveats

Users of these tables should take note of the following comments:

- The claims costs represent average eligible claims (before application of deductibles, maximums, and co-insurances) by the major group health and dental benefit components. It does not vary by the various benefit options, internal deductibles, co-insurances, and maximums typically of most plans which will influence both utilization and costs of the plans even before maximums and out-of-pocket costs are applied.
- The annual group health and dental claims costs can vary significantly from one employer plan to another, even with the same benefit design, due to utilization patterns related to their employees; their utilization will also be influenced by the employees' out-of-pocket costs depending on their socio-economic status.
- The claims costs are average claims costs with no split by active, disabled, or retired employees. It can be expected that retired employees may have slightly higher health claims and that disabled employees will have significantly higher health claims.
- The PE 2007–09 Graduated Tables include average observed senior provincial drug plan offset factors at age 65 for each of the provinces. They represent averages for all insurers and drug plans. However, this offset can vary significantly depending on a specific plan's covered formulary and utilization patterns. For example, a brief analysis of one insurer's plan, by formulary type, showed offset factors varied from 30 percent for rich direct drug plans to 69 percent for basic reimbursement plans, with an average of 43 percent for Ontario for all the insurer's drug plans. This compares with an average Ontario offset factor of 48 percent for all insurers and drug plans.

- The tables relate to the 2007–09 experience period and changes have taken place since then in terms of benefit designs, provincial plans, utilization patterns, and average costs.

16. Conclusion and Recommendations

This was the first post-employment benefits experience study in Canada designed to assist in post-employment benefit valuation. Here are a few recommendations for future follow-up studies:

- While this study is helpful, it is recommended that future studies try to deal with the large variety of drug plans in use across Canada.
 - Perhaps just a drug-only experience study is sufficient as a next step. It should capture information related to the plans' formularies to allow it to be categorized by richness of the formularies.
 - Identify sources of drug utilization information that can be used on a real-time basis to assist actuaries in updating their valuation factors and costs for pharmaceuticals by formularies or drug type—generic, brand, specialty drug (biologics), etc.
- The employee status field (active, disabled, or retired) was poorly populated with only two small insurers providing data for this field; hence, we were unable to analyze the expected difference in annual claims cost. Investigate ways to increase the population of this field and include disabled employee data for all ages by major cause of disability.

Appendix A

Request for Data

Post-employment Benefits Experience Study

for

Canadian Institute of Actuaries

Data Request – Insurers

Canadian Post-employment Health and Dental Claims Experience Study

We have had feedback on the second draft of our data request and are pleased to announce 13 insurers will be participating in this study including two of the large three insurers.

We have made a few changes from the second draft as follows:

- *Added plan codes; and*
- *Added spouse age to dependent claim record.*

Privacy concerns have been expressed with providing division and cert number information. However, this information is very useful in following claims year-to-year and developing predictive models for large claims. If concerned, participants can simply develop unique number(s) for division and/or cert (not actual division or cert numbers).

Division is needed to allow us to develop additional plan coverage details beyond the regular plan codes (i.e., hospital, private duty nurse, etc.) using the claims information by division. It is very necessary if limited, or no, plan codes are provided.

Exclude data was related to the following:

- Affinity type groups;
- Health Spending Account business; and
- Groups where provincial drug plan over age 65 is second payer.

Submitted data should include the following:

- Data for calendar years 2005–09 related to employees age 50+ in each of the calendar years (year of birth 1955–59 or earlier respectively);
- HO billed business—both exposure and claims data; and
- Self-billed and ASO business—claims data only.

If convenient, data can combine HO billed records for exposure and claims into one record, for each calendar year, by employee – need two if family coverage.

Exposure Data

Calendar year end (2005–09)
Group
Division
Cert number of employee
Year of birth of employee
Gender of employee
Province of residence
Employment status (A – active, D – disabled, or R – retired) – if available
Single or family EHC coverage
EHC drug plan code
EHC other plan code
Single or family dental coverage
Dental plan code

Drug codes

RB – reimbursement covering brand-name drugs
RG – reimbursement covering generic drugs only
DB – direct pay covering brand-name drugs
DG – direct pay covering generic drugs only
FB – card with deferred pay covering brand-name drugs
FG – card with deferred pay covering generic drugs only

EHC other codes

VC – with vision and O/S Canada
C – O/S Canada but no vision
V – with vision but no O/S Canada
N – no vision and no O/S Canada

Dental codes

B – basic only
BM – basic with major
BMO – basic, major, and ortho

Family codes

S – single
F – family
C – couple
N – no coverage for either EHC or dental (if just dental or EHC)

Provincial Codes

BC, AB, SK, MB, ON, QC, NB, NS, PE, NL, YT, NT, NU

Claims Data

Employee or dependent claim record (E or D)
Calendar year – paid basis (2005–09)
Group
Division
Cert number of employee
Year of birth of employee
Gender of employee
Province of residence
Spouse year of birth if dependent claim record (if available)
Single or family EHC coverage
EHC drug plan code
EHC other plan code
Eligible EHC claims (excluding O/S Canada)
 Drugs
 Hospital
 Paramedical
 Medical Supplies
 Vision
 Private duty nursing
 Other EHC
Paid EHC claims (excluding O/S Canada)
 Drugs
 Hospital
 Paramedical
 Medical Supplies
 Vision
 Private duty nursing
 Other EHC
 O/S Canada paid claims
Single or family dental coverage

Dental plan code

Eligible dental claims
 Basic benefits
 Major benefits
 Orthodontic benefits

Paid dental claims
 Basic benefits
 Major benefits
 Orthodontic benefits

One record should be produced for each of employee claims and dependent claims for each calendar year. Hence, two records per employee, for each calendar year, if family coverage.

Eligible claims means benefits that would be payable in the absence of deductibles, co-insurance, and annual maximums.

Whole dollars preferred for claims.

Preferred data format is flat text files with comma or semi-colon field separator, since this facilitates the most universal access. Database files (DBF) are also OK.

Please split into separate files if any file exceeds 1 GB.

Please zip the files with a password to protect your data.

E-mail jhave@telus.net or mail password separately to address provided below.

Once you have reviewed the above data request please let us know the following:

- Any anticipated data difficulties;
- Anticipated completion date;
- Approximate number of records;
- Expected data format and approximate file sizes;
- Mode of file delivery – USB key by mail or courier, e-mail, etc.
If e-mail, please send to Have Associates data transfer e-mail address jhave@haveassoc.com which can hold up to 100 MB of data.

Please e-mail or call us if you have questions.

John Have
416-623-0339
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866-591-0783
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Courier Address:

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Appendix B

Comparison Results – Before and After Application of Insurer/Regional Factor

This appendix shows the incidence and average claim size along with the annual costs for the 2007–09 experience period for both full and EHC, and dentals with exposure.

Comparison of Incidence Rates for Full EHC Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	0.74	0.66	0.49	0.62	0.49	0.64	0.54	0.65	0.77	0.76	0.53	0.70	0.69	0.70
50-59	0.71	0.63	0.49	0.61	0.48	0.62	0.53	0.64	0.80	0.78	0.52	0.71	0.68	0.70
60-64	0.76	0.69	0.51	0.62	0.52	0.68	0.56	0.69	0.88	0.82	0.55	0.72	0.74	0.74
65-69	0.79	0.74	0.49	0.61	0.52	0.68	0.55	0.69	0.65	0.69	0.54	0.69	0.71	0.70
70-79	0.80	0.78	0.51	0.74	0.61	0.81	0.52	0.65	0.52	0.57	0.50	0.66	0.71	0.65
80+	0.67	0.66	0.51	0.76	0.59	0.92	0.47	0.54	0.43	0.51	0.42	0.38	0.61	0.58
Dependent	0.67	0.59	0.38	0.53	0.37	0.56	0.41	0.57	0.72	0.74	0.41	0.66	0.60	0.63
50-59	0.65	0.57	0.36	0.52	0.34	0.54	0.40	0.56	0.73	0.73	0.40	0.65	0.58	0.62
60-64	0.68	0.61	0.42	0.55	0.41	0.60	0.45	0.60	0.82	0.84	0.45	0.67	0.64	0.68
65-69	0.73	0.66	0.42	0.53	0.45	0.63	0.44	0.59	0.59	0.68	0.45	0.69	0.64	0.64
70-79	0.77	0.73	0.43	0.61	0.48	0.70	0.43	0.55	0.46	0.55	0.46	0.64	0.67	0.61
80+	0.71	0.67	0.37	0.44	0.56	0.82	0.37	0.46	0.42	0.54	0.42	0.50	0.63	0.58

Comparison of Average Annual Claim Size for Full EHC Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	1005	972	1002	1003	934	933	1383	1282	1385	1351	1215	1405	1175	1246
50-59	931	877	941	966	852	855	1270	1202	1328	1275	1095	1311	1121	1173
60-64	1040	1043	1187	1177	1088	1088	1617	1538	1760	1677	1434	1649	1365	1503
65-69	1073	1131	1069	983	1012	960	1405	1182	1087	1248	1579	1534	1112	1197
70-79	1083	1122	1075	782	1441	1526	1706	1248	955	1110	1527	1500	1100	1143
80+	1182	1234	2435	1004	1620	1350	2232	1859	1221	1322	2370	1856	1261	1388
Dependent	878	903	1048	1057	959	983	1316	1285	1343	1359	1237	1248	1072	1229
50-59	796	829	973	1053	898	957	1221	1227	1320	1315	1108	1176	1022	1182
60-64	942	991	1278	1058	1049	952	1521	1447	1646	1633	1557	1390	1244	1420
65-69	996	1062	1181	1047	987	1119	1404	1395	946	1106	1353	1524	1038	1186
70-79	1012	1044	1301	1278	1379	1197	1588	1233	769	969	2029	1494	1031	1068
80+	1116	1164	1255	907	2198	2024	1969	1748	1018	1511	2239	1910	1181	1408

Comparison of Annual Cost for Full EHC Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	741	645	493	618	462	598	742	833	1,063	1,028	641	987	816	872
50-59	662	553	459	591	410	530	675	767	1,058	991	573	931	762	816
60-64	788	716	605	729	565	734	912	1,053	1,552	1,383	794	1,186	1,015	1,116
65-69	853	834	526	598	522	651	770	812	711	856	850	1,059	795	833
70-79	871	870	548	580	882	1,232	886	810	494	630	758	983	778	739
80+	788	816	1,238	768	950	1,240	1,048	1,011	527	677	993	700	772	798
Dependent	593	536	395	558	351	550	543	735	968	1,006	508	822	648	780
50-59	515	470	354	549	309	515	487	692	970	964	439	769	594	737
60-64	643	601	536	579	434	572	689	871	1,358	1,367	701	935	801	968
65-69	726	706	494	556	443	710	625	820	556	757	615	1,056	664	761
70-79	778	766	563	782	660	837	684	684	357	536	934	950	688	657
80+	787	785	464	397	1,226	1,657	722	799	430	820	947	953	743	810

Comparison of Incidence Rates for Full Dental Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	0.42	0.48	0.36	0.43	0.34	0.45	0.45	0.48	0.56	0.53	0.37	0.52	0.47	0.49
50-59	0.42	0.48	0.36	0.43	0.35	0.46	0.45	0.48	0.57	0.53	0.37	0.50	0.48	0.50
60-64	0.43	0.48	0.34	0.40	0.34	0.43	0.45	0.49	0.54	0.51	0.35	0.57	0.45	0.49
65-69	0.43	0.50	0.34	0.44	0.33	0.42	0.44	0.49	0.53	0.54	0.36	0.51	0.44	0.50
70-79	0.44	0.53	0.39	0.47	0.41	0.52	0.42	0.50	0.49	0.52	0.43	0.54	0.44	0.51
80+	0.33	0.36	0.40	0.36	0.31	0.57	0.37	0.42	0.29	0.33	0.33	0.98	0.34	0.38
Dependent	0.35	0.44	0.31	0.41	0.29	0.42	0.35	0.41	0.54	0.50	0.30	0.46	0.39	0.45
50-59	0.35	0.44	0.31	0.41	0.28	0.43	0.35	0.41	0.56	0.51	0.31	0.47	0.40	0.45
60-64	0.36	0.45	0.31	0.40	0.29	0.38	0.36	0.41	0.48	0.46	0.30	0.39	0.38	0.43
65-69	0.38	0.47	0.30	0.39	0.30	0.40	0.36	0.43	0.47	0.49	0.29	0.50	0.37	0.45
70-79	0.37	0.46	0.34	0.45	0.40	0.53	0.36	0.42	0.41	0.41	0.30	0.50	0.37	0.43
80+	0.32	0.35	0.18	0.11	0.31	0.42	0.30	0.37	0.26	0.28	0.33	0.17	0.29	0.32

Comparison of Average Annual Claim Size for Full Dental Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	802	809	848	940	642	621	720	674	560	564	557	537	670	663
50-59	784	782	843	910	629	608	707	664	541	543	547	483	651	643
60-64	867	873	865	994	699	680	750	687	630	612	596	700	727	705
65-69	832	912	886	1114	697	596	767	734	676	655	635	627	753	754
70-79	798	781	819	1012	526	578	750	697	639	641	484	646	716	694
80+	689	813	836	1497	607	711	686	647	623	601	449	598	669	685
Dependent	835	987	855	1095	682	768	725	793	627	638	522	667	709	788
50-59	840	1034	862	1150	697	798	729	833	626	641	527	652	709	813
60-64	844	867	830	898	665	764	727	703	635	627	487	621	720	723
65-69	816	872	831	890	675	487	693	661	633	617	575	852	705	705
70-79	748	924	814	1089	475	571	675	643	646	661	500	884	675	722
80+	618	684	985	2982	487	280	714	766	507	638	598	598	654	705

Comparison of Annual Cost for Full Dental Plans with Exposure - Before and After Region / Insurer Adjustments														
EE Age	BC		AB		PRAIRIE		ON		QC		EAST		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Employee	340	392	302	402	222	282	324	323	314	297	204	279	314	328
50-59	332	377	303	394	219	279	321	317	308	289	203	244	310	319
60-64	369	421	294	400	234	291	337	333	341	313	206	399	330	344
65-69	358	461	301	488	227	250	338	358	360	353	226	322	335	380
70-79	354	410	316	476	217	298	318	348	312	331	208	348	315	354
80+	227	294	338	545	189	408	254	274	180	197	148	583	230	261
Dependent	293	434	266	446	196	323	256	327	337	318	159	305	277	352
50-59	290	450	268	473	196	343	256	343	348	329	162	304	282	366
60-64	307	388	258	355	194	289	264	291	303	291	144	244	271	312
65-69	309	406	250	348	205	194	249	282	298	301	165	424	263	318
70-79	276	424	275	486	191	305	241	273	265	271	152	444	249	311
80+	197	237	181	320	151	118	216	280	130	179	199	100	191	224

Appendix C

Glossary of Acronyms and Terms used in Group Insurance

ASO – Administrative services only. Insurer performs only claims adjudication. Insurer may offer separate stop-loss insurance for large claims.

CIHI – Canadian Institute for Health Information.

CPI – Consumer price index.

EHC – Extended healthcare. Typical name for group health plans covering medical expenses not covered by provincial healthcare plans.

GDP – Gross domestic product.

HO – Head office. Reference to fully-insured and head-office-billed group insurance.

O/S Canada – Outside of Canada. Refers to health claims incurred while outside Canada.

PE – Post-employment. Refers to group health and dental insurance for disabled and retired employees.