Brown's Economic Damages Newsletter

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2006 PALS: Wage deficits by degree of severity (Replicating the 2001 PALS regression results[1])

In our January 2010 edition of **Brown's Economic Damages Newsletter,** we presented preliminary results from the 2006 *Participation and Activity Limitation Survey* ("PALS") which had been summarized from various Statistics Canada articles. In this edition of the newsletter, we now present results from regression analysis as to the gap in earnings between the persons with a disability, and the non-disabled, which controls for other factors affecting earnings. In other words, we can be more confident about using the regression analysis to calculate wage gaps because the regression analysis is superior to comparing simple averages, as it isolates the impact of disability on earnings (from other impacts).[2] These results have been derived from the PALS "PUMF" (public use micro-data file).[3]

In the January 2010 edition, we presented labour force statistics (participation rate, unemployment rate, etc) and simple comparison of median earnings (Figures 7, 8 & 9). From Figures 7, 8 & 9, we showed that the impact of disability ranged from –22% to –42% in median earnings across the country, with an average deficit of –32.7% (Figure 7). However, these figures combined both men and women. When we segregated the population by gender, the wage deficits were found to be –27% for females, and –37% for males (Figure 8). In Figure 9, we showed that for most types of disabilities, the *severity* of disability *decreased* the level of average earnings,[4] as is to be expected.

[1] As published in C.L. Brown and J.C.H. Emery, ""The Impact of Disability on Earnings and Labour Force Participation in Canada: Evidence from the 2001 PALS and from Canadian Case Law", *Journal of Legal Economics*, Vol. 16, no. 2, April 2010.

[2] In the January 2010 edition of the **Brown's Economic Damages Newsletter,** this author wrote: "…we present preliminary findings from several catalogues released by Statistics Canada using the 2006 PALS data. Note that these findings fall in to the category of 'descriptive statistics', in that they are simple means and average statistics. No attempt yet has been made to analyze this data in terms of regression analysis, which allows us to control for the impact of other variables than disability on earnings and employment. Regression analysis will be the next step in the process now that we have obtained the 2006 PALS PUMF ["public use micro-data file"]. Nonetheless, these 'descriptive statistics' are a starting point in observing the experience of disabled persons in the Canadian labour force." (p. 1)

[3] The PUMF, available from Statistics Canada for purchase upon signing a license agreement, gives the user the 'raw' data from the 2006 PALS survey, i.e., the actual responses from the survey respondents.

[4] The exceptions to this were the categories of communication, learning and developmental disabilities. In these cases, those with mild or moderate disabilities earned less than those with severe or very severe disabilities. This may be because *only* the high-income earning persons with these types of severe or very severe disabilities go into the labour market (i.e., the low-income earning persons drop out of the labour force), thereby increasing the average earnings estimate.

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INTRODUCING THE 2006 PALS SURVEY

The 2006 PALS took place between October 30, 2006 and February 28, 2007. It is funded by the Human Resources and Social Development Canada (HRSDC). The PALS 2006 results can be compared with the 2001 survey to identify trends in the previous five years.[5] The *Participation and Activity Limitation Survey* (PALS) is Canada's national survey that gathers information about adults and children whose daily activities are limited by a physical, mental, or other health-related condition or problem.[6] The PALS "PUMF" ("public use micro-data file") was released by Statistics Canada in late 2009.

The definition of disability from the PALS is "persons with disabilities…who reported difficulties with daily living activities, or who indicated that a physical or mental condition or health problem reduced the kind or amount of activities they could do." PALS uses the World Health Organization's (WHO) framework of disability provided by the International Classification of Functioning (ICF).[7] The sample of disabled persons is drawn from those who answer "YES" to the Census disability filter question. (The Census[8] is conducted every 5 years and is a mandatory survey that Canadians complete and yields information about population, housing, income, expenditures, etc.) The precursors to the 2006 PALS were the 2001 PALS and the 1991 HALS.[9]

The sample of the PALS 2006 survey was 47,793: 8,954 children (persons under 15 years of age) and 38,939 adults.[10] The response rate was 75.0%.[11] In 2001, 43,276 individuals were selected for PALS. The PALS 2006 included the territories and Aboriginal communities, which were previously excluded from the 2001 PALS target population. These changes resulted in an increase of 1.2% in the number of people included in the PALS 2006.[12]

From the 2001 PALS, **12.4% of the total population** reported being disabled in Canada (11.5% males, 13.3% females). In the 2006 PALS, these rates changed to **14.3% overall** (13.4% males, 15.2% females).[13]

The following figures compare the populations between the 2001 and 2006 PALS surveys with respect to the *severity* of disability (mild, moderate, severe or very severe); and then with respect to *type* of disability. Figures 1 and 2 compare the distributions for all ages for these two disability categories. Figure 3 compares the *severity* of disability distribution *by age group,* but only from the 2006 PALS, since the distributions are so similar in the two years (2001 and 2006).

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[5] As per Statistics Canada's *Participation and Activity Limitation Survey 2006: Analytical report*. See http://www.statcan.ca/english/freepub/89-628-XIE/89-628-XIE2007002.htm.
[6] As per Statistics Canada's *Participation and Activity Limitation Survey 2006: Tables 2006*, catalogue no. 89-628-XIE - No. 003 (Ottawa, Ontario: Minister of Industry), December 2007, p.2.
[7] As per Statistics Canada's *Participation and Activity Limitation Survey 2006: Technical and Methodological Report*. See http://www.statcan.ca/english/freepub/89-628-XIE/89-628-XIE2007001.htm.
[8] Census information is combined with data from the HALS and PALS respondents to provide socio-economic details on the respondents. This allows us to compare income levels, education levels, employment characteristics, labour force attachment, etc.
[9] The precursor to the 1991 HALS was the 1986 HALS, but the 1991 survey improved on the 1986 one considerably. Given the 1986 survey is now more than 20 years old, was the first in this cycle of surveys, and we have three since then, we do not display the 1986 results.
[10] As per Statistics Canada's *Participation and Activity Limitation Survey 2006: Technical and Methodological Report*. See http://www.statcan.ca/english/freepub/89-628-XIE/89-628-XIE2007001.htm.
[11] As per Statistics Canada's *Participation and Activity Limitation Survey 2006: Analytical report*. See http://www.statcan.ca/english/freepub/89-628-XIE/89-628-XIE2007002.htm.
[12] As per Statistics Canada's *Participation and Activity Limitation Survey 2006: Technical and Methodological Report*. See http://www.statcan.ca/english/freepub/89-628-XIE/89-628-XIE2007001.htm.
[13] As per Statistics Canada's *Participation and Activity Limitation Survey 2006: Tables*. Catalogue no. 89-628-XIE – No. 003. (Ottawa: Minister of Industry, 2007). Tables 3.1 and 3.1-1, pp. 31-32. These rates exclude the Yukon, Northwest Territories and Nunavut. The total size of the 2001 PALS sample was 43,276; the total size of the 2006 PALS sample was 47,793. In 2001, the Aboriginal community was excluded as it was covered in the *Aboriginal Peoples Survey* (APS); in 2006, the aboriginal communities were included. (Source: Statistics Canada's *Participation and Activity Limitation Survey 2006: Technical and Methodological Report*, catalogue no. 89-0628-XIE – No. 001 (Ottawa, Ontario: Minister of Industry), December 2007, pp. 10 and 12).

Figure 1: Comparison of severity distributions, 2001 & 2006[14]

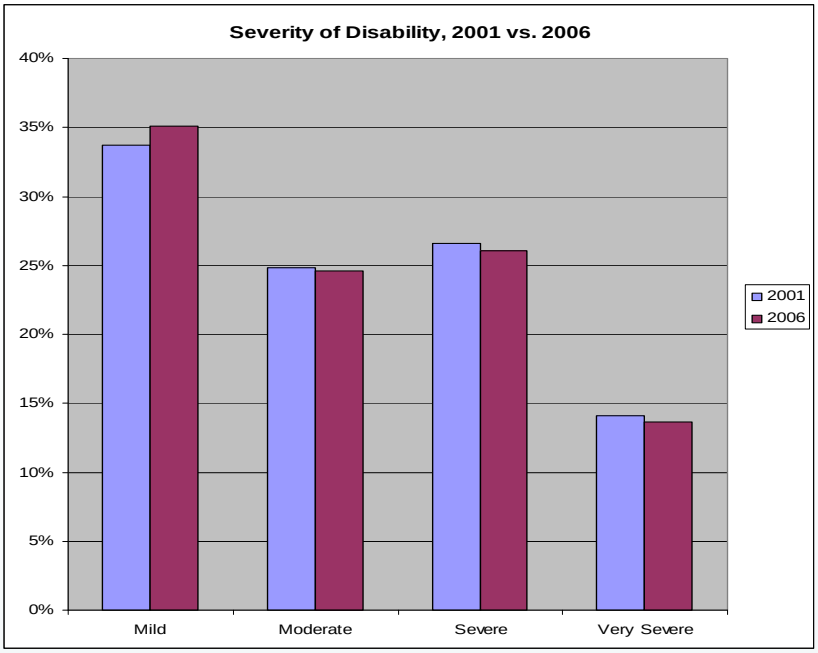
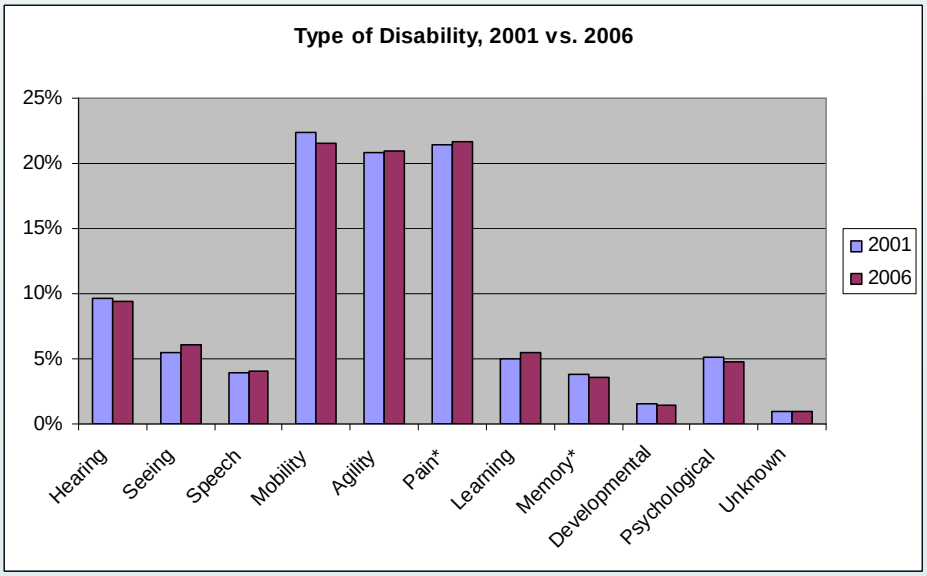


Figure 1 shows that the proportion of the Canadian population that is disabled (12% in 2001, rising to 14% in 2006) changed very little from 2001 to 2006: 60% of the disabled fall into the mild/moderate categories, the other 40% is comprised of severe/very severe. Only 14% of the disabled population falls into the "very severe" category. The largest category is the mildly disabled (35%).

Figure 2 compares the distribution of disabled Canadians by type of disability.

Figure 2: Comparison of type of disability distributions, 2001 & 2006[15]



[14] Source: Statistics Canada's *Participation and Activity Limitation Survey 2006: Tables*, Catalogue no. 89-628-XIE, released December 2007.
[15] Source: Statistics Canada's *Participation and Activity Limitation Survey 2006: Tables*, Catalogue no. 89-628-XIE, released December 2007, Tables 5.1; 5.2; 5.3; 5.4; and 5.5. The asterisks next to the "pain" and "memory" categories simply mean that the proportions were calculated on the basis of all injured over the age of 15, so exclude children. The other categories include disabled persons of all ages with the same type of affliction.

Figure 2 shows that the largest group of disabled people in Canada in 2005 were those beset by mobility, agility and pain restrictions. The smallest afflicted group was those with "developmental" disabilities. Again, the division amongst categories of disability is very similar between the 2001 and 2006 surveys. In the 2006 survey, there was a small decrease in the persons with hearing, mobility and psychological disabilities, but a small increase in those with seeing, agility, pain and learning disabilities.

Figure 3 breaks down the severity of disability by age group from the 2006 PALS survey.

Figure 3: Distribution of disability by severity, by age, 2006[16]

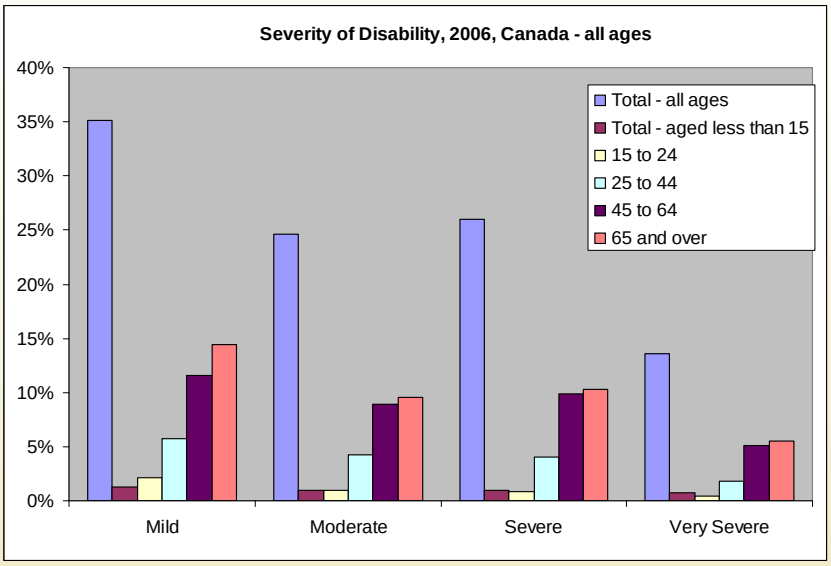


Figure 3 shows the same breakdown for the category "Total – all ages" as in Figure 1, so it is echoing the distribution of all disabled by severity (largest number in the "mild" category; smallest number in the "very severe" category). After that, we see that the largest number of disabled persons in any severity category is the oldest: 65 and over. This is not unexpected given the tendency for illness to manifest as age progresses. Surprisingly, however, there are almost as many "severe" as "very severe" disabled persons when the 45 to 64 year old age groups are compared to the 65+ age groups. Not unexpectedly, the fewest number of people afflicted with a disability are the youngest age groups: children, and youths 15 to 24.

USE OF PALS DATA IN CIVIL LITIGATION

The usefulness of the HALS and PALS surveys is that they provide a statistical basis to formulate a future "loss of earning capacity" or "loss of opportunity" award. **When there exists medical and/or vocational evidence indicating that the claimant will suffer impediments in the future but the precise nature of such impairments is unknown (or difficult to quantify) at the time of settlement or trial**, the data from the HALS and PALS surveys allow us to estimate a future loss of income by applying wage deficits in percentage terms.

[16] Source: Statistics Canada's *Participation and Activity Limitation Survey 2006: Tables*, Catalogue no. 89-628-XIE, released December 2007.

Examples of when HALS/PALS data can be used

In some cases involving children and young adults, the injury has not necessarily affected the plaintiff's educational attainment. If this is the case, then the quantum expert will not be able to do the usual comparison of earnings by education level. This is where PALS deficits can be useful.

In other cases, the adult plaintiff has continued in the same job (or type of job) and/or has continued to work full-time; but s/he is not working any overtime, or working as efficiently or productively, and it is feared that the plaintiff will lag behind his or her peers in the future. In such cases, the PALS deficits can be used.

In still other cases, a plaintiff might have kept working, and a 'boom' in the plaintiff's industry (whether it be oil & gas, construction, fishing, etc.) obscures the fewer hours or jobs worked by the plaintiff since the incident. In this case, the plaintiff might be earning *more* since the incident, *not* less; but it is only because the 'boom' in the industry is providing more seasonal work or paying higher wages, but the plaintiff is still working fewer hours or weeks than before the incident (or would have worked *more* hours or *more* weeks if s/he had not been injured, and would have earned an even higher income). In such cases, the PALS data can be used to compute a potential loss of income.

What counsel needs to do in HALS/PALS cases

If the court finds the plaintiff will suffer an ongoing disability in the future of, say 25%, then the HALS/PALS data can be used to substantiate that the plaintiff has a disability that is affecting his or her earning capacity to this degree. There are three steps in this process:

1. Medical and/or vocational evidence is adduced to attest to the claimant's impairments and that these impairments will affect his or her earning capacity in the future;
2. Research shows that people with disabilities, depending on severity or type of disability, experience wage gaps compared to non-disabled people; and
3. The plaintiff completes the same questionnaire as filled out by HALS and PALS respondents to determine his/her level of severity of disability.

Counsel for the plaintiff is responsible for assembling the documentation in (1), if it exists. Brown Economic has already done the research on wage gaps with the HALS and PALS data ((2) above) so we know what percentage wage deficits to apply to the plaintiff's earning capacity in the future (see Table 1 below). The plaintiff subsequently completes the HALS/PALS questionnaires to provide a determination of his/her severity of disability under (3) above. To obtain the HALS and PALS questionnaires, please contact our firm at **1-888-BEC-ASST** (1-888-232-2778).

Brown Economic has derived **specific wage deficits, as a percentage of income**,[17] to apply based on gender and **SEVERITY OF DISABILITY**.[18] We have also derived wage deficits based on **TYPE OF DISABILITY**,[19]using percentages.

[17] For the results showing percentage of wage deficits, see **The Economics Editor**, "Proving economic loss when injury isn't obviously manifest & magnitude of impact unknown at settlement", November/December 2007, Vol. 4, Issue 8; Tables 1 and 2 on p. 2; or C.L. Brown and J.C.H. Emery, ""The Impact of Disability on Earnings and Labour Force Participation in Canada: Evidence from the 2001 PALS and from Canadian Case Law", *Journal of Legal Economics*, Vol. 16, no. 2, April 2010, Table 6, p. 46.

[18] The percentages by severity of disability (mild, moderate, severe and very severe) are for average educational levels. When sample sizes are divided up by gender and education level and severity of disability, many of the samples are too small to derive results for specific education levels.

[19] The "type" of disability include: agility; hearing; mobility; pain; seeing; speech; and other. The "other" category consists of disabilities related to learning, memory, developmental, psychological, and unknown.

These percentages have been calculated using sophisticated regression analysis, namely Heckman's two-stage process and correction for sample selection bias, as described in Berndt and Greene.[20] *The usefulness of regression analysis to derive the percentage losses cannot be underestimated and are more accurate than simply calculating the "residual" income of disabled people*. The latter will **grossly overestimate the loss arising from disability** because other human capital factors are not controlled for, as they are in regression analysis. Moreover, using an average income for disabled people for a claimant's "residual earning capacity" is not specific enough to the plaintiff since it does not represent the *plaintiff's* education level, whereas applying wage deficits from regression analysis *will* be specific to the plaintiff's human capital characteristics.

WAGE GAPS FROM THE 2001 PALS & 2006 PALS: BY **SEVERITY** LEVEL

The economics literature is clear on its consensus about how disability affects employment and income: it causes the injured person to work fewer hours or weeks per year; or s/he works less productivity or less efficiently than when s/he was not impaired. Brown Economic has computed wage deficits for disabled Canadians from both the 2001 PALS[21] and the 2006 PALS.[22] These are summarized below.

The overall impact of disability is –33% on women and –21% on men, across all levels of severity, from the 2006 PALS PUMF. Table 1 shows the breakdown by severity of disability for women and men. Table 2 compares the 2006 PALS deficits with the 2001 PALS wage deficits.

Table 1: Wage deficits, 2006 PALS, by severity of disability

Severity level	Women	Men
MILD	- 16%	- 16%
MODERATE	- 36%	- 22%
SEVERE	- 66%	- 42%
VERY SEVERE	- 66%[23]	- 51%

[20] Ernst R. Berndt, *The Practice of Econometrics Classic and Contemporary* (Massachusetts: Addison-Wesley Publishing Company), 1991; and William H. Greene, *Econometric Analysis* 2nd edition (Englewood Cliffs, New Jersey: Prentice-Hall), 1993.
[21] As published in C.L. Brown and J.C.H. Emery, "The Impact of Disability on Earnings and Labour Force Participation in Canada: Evidence from the 2001 PALS and from Canadian Case Law", *Journal of Legal Economics*, Vol. 16, no. 2, April 2010, Table A, p. 32; Table 6, p. 46.
[22] Only results that are statistically significant are shown, based on the 2-stage Heckman regression model, excluding high-income earners. These are preliminary estimates.
[23] This result is the impact on labour force participation rather than wages.

Table 2 reproduces the results from Table 1, with a comparison to the wage deficits from the 2001 PALS PUMF.

Table 2: Comparison of wage deficits, 2001 PALS[24] & 2006 PALS

SEVERITY OF DISABILITY	WOMEN		MEN	
	2001 PALS	**2006** PALS	**2001** PALS	**2006** PALS
Overall disability	- 29%	- 33%	- 22%	- 21%
MILD	- 21%	- 16%	- 15%	- 16%
MODERATE	- 29%	- 36%	- 23%	- 22%
SEVERE	- 49%	- 66%	- 33%	- 42%
VERY SEVERE	- 57%	- 66%[25]	- 49%	- 51%

Table 2 shows that the aggregate ("overall" disability) levels are quite similar between the 2001 and 2006 PALS (29 versus 33% for women; 22 versus 21% for men); and for the men, the results are remarkably consistent in the mild and moderately disabled categories (-15 and -16% for mild, -22 and -23% for moderate, from the 2001/2006 PALS databases, respectively). There is more divergence in the estimates for the women, however: the mildly disabled are better off in the 2006 PALS than the 2001 PALS (-16% versus -21%) but the moderately, severely and very severely disabled women are worse off in the 2006 PALS than in the 2001 PALS. Nevertheless, the fact that the results have produced marginal effects which are all consistently negative (i.e., disability has a downward impact on wages) and are all statistically significant lends a great deal of credibility and confidence in the results from both surveys. We would expect the percentages to differ, however, since the random samples of both the 2001 and 2006 PALS surveys mean that different people would have been selected to complete the surveys. In other words, both the 2001 PALS and 2006 PALS surveys are *cross-sectional* ones; they are a 'snapshot' of the disabled population in 2000 and 2005, respectively. They are not *longitudinal* surveys, which follow the same people through time. They are also going to differ because these 'snapshots' from the surveys contain income information from 2000 and 2005. To the extent that business cycle effects and economic activity levels are different in these two years, the wage deficits can be expected to be different.

The way in which these percentages are used is to apply the negative percentage directly to the income stream, like we would a negative contingency for unemployment. For instance, we could calculate a plaintiff's potential future loss of opportunity by assuming that he will experience a –21% impact on his income, *on average,* throughout his career. If the plaintiff completes the questionnaire (like the PALS respondents), then we could apply a percentage consistent with whatever degree of severity is scored from the questionnaire (i.e., mild, moderate, etc.)

[continued page 8]

[24] C.L. Brown and J.C.H. Emery, ""The Impact of Disability on Earnings and Labour Force Participation in Canada: Evidence from the 2001 PALS and from Canadian Case Law", *Journal of Legal Economics*, Vol. 16, no. 2, April 2010, Table 6, p. 46.
[25] This result is the impact on labour force participation rather than wages.

The previous editions of **Brown's Economic Damages Newsletter** that touch upon the HALS/PALS data for use in civil litigation includes:

- "2006 *Participation and Activity Limitation Survey* ("PALS"): preliminary results" January 2010, vol. 7, issue #1
- "Proving economic loss when injury isn't obviously manifest & magnitude of impact unknown at settlement" November/December 2007, vol. 4, issue #8
- "Reduction in housework due to disability (2001 PALS & 1991 HALS data)" February 2007, vol. 4, issue #2
- "*Participation and Activity Limitation Survey* ("PALS") - Profile of Disability in Canada" March 2007, vol. 4, issue #3
- "2001 PALS (*Participation & Activity Limitation Survey*) Results: Wage gaps due to disability" June 2005, vol. 2, issue #6
- "Additional findings from the 2001 PALS, with comparisons to the 1991 HALS" July/August 2005, vol. 2, issue #7
- "*Robinson v. Williams* (2005) decision - excerpts from judgment" December 2005, vol. 2, issue #10
- "*Health and activity limitation survey* (HALS)" June 2002, vol. 1, issue #21 [ATLANTIC ISSUE]
- "*Health and activity limitation survey* (HALS) - data collection questionnaire" July 2002, vol. 1, issue #22 [ATLANTIC ISSUE]

UPDATING NON-PECUNIARY AWARDS FOR INFLATION (JANUARY 2011, CANADA)

		Non-Pecuniary Damages - Sample Awards				
Year of Accident/ Year of Settlement or Trial	**"Inflationary" Factors***	$10,000	$25,000	$50,000	$75,000	$100,000
January 2010-January 2011	1.018	$10,181	$25,454	$50,907	$76,361	$101,815
Avg. 2009-January 2011	1.020	$10,198	$25,494	$50,988	$76,481	$101,975
Avg. 2008-January 2011	1.025	$10,246	$25,615	$51,229	$76,844	$102,459
Avg. 2007-January 2011	1.047	$10,470	$26,175	$52,351	$78,526	$104,702
Avg. 2006-January 2011	1.069	$10,694	$26,734	$53,469	$80,203	$106,937
Avg. 2005-January 2011	1.091	$10,908	$27,269	$54,538	$81,807	$109,076
Avg. 2004-January 2011	1.115	$11,149	$27,874	$55,747	$83,621	$111,494
Avg. 2003-January 2011	1.136	$11,357	$28,392	$56,783	$85,175	$113,567
Avg. 2002-January 2011	1.167	$11,670	$29,175	$58,351	$87,526	$116,702
Avg. 2001-January 2011	1.193	$11,934	$29,835	$59,670	$89,504	$119,339
Avg. 2000-January 2011	1.223	$12,234	$30,586	$61,171	$91,757	$122,342
Avg. 1999-January 2011	1.257	$12,568	$31,419	$62,838	$94,257	$125,676
Avg. 1998-January 2011	1.279	$12,785	$31,963	$63,926	$95,889	$127,851
Avg. 1997-January 2011	1.291	$12,912	$32,281	$64,562	$96,844	$129,125
Avg. 1996-January 2011	1.312	$13,122	$32,804	$65,608	$98,412	$131,216
Avg. 1995-January 2011	1.333	$13,328	$33,321	$66,642	$99,963	$133,284
Avg. 1994-January 2011	1.361	$13,615	$34,036	$68,073	$102,109	$136,145
Avg. 1993-January 2011	1.364	$13,637	$34,092	$68,184	$102,276	$136,368
Avg. 1992-January 2011	1.389	$13,892	$34,729	$69,458	$104,188	$138,917
Avg. 1991-January 2011	1.410	$14,098	$35,245	$70,491	$105,736	$140,981
Avg. 1990-January 2011	1.489	$14,892	$37,229	$74,458	$111,686	$148,915
Avg. 1989-January 2011	1.560	$15,604	$39,011	$78,022	$117,033	$156,044
Avg. 1988-January 2011	1.638	$16,382	$40,955	$81,911	$122,866	$163,821
Avg. 1987-January 2011	**1.704**	$17,040	$42,600	**$85,200**	$127,800	$170,400
Avg. 1986-January 2011	1.778	$17,783	$44,457	$88,913	$133,370	$177,827
Avg. 1985-January 2011	1.853	$18,528	$46,320	$92,641	$138,961	$185,281
Avg. 1984-January 2011	1.926	$19,262	$48,155	$96,311	$144,466	$192,621
Avg. 1983-January 2011	2.009	$20,091	$50,228	$100,456	$150,684	$200,913
Avg. 1982-January 2011	2.127	$21,271	$53,176	$106,353	$159,529	$212,705
Avg. 1981-January 2011	2.356	$23,559	$58,899	$117,797	$176,696	$235,595
Avg. 1980-January 2011	2.650	$26,502	$66,256	$132,512	$198,768	$265,024
Avg. 1979-January 2011	2.919	$29,187	$72,968	$145,935	$218,903	$291,871
Jan. 1978-January 2011	**3.325**	$33,245	$83,113	$166,225	$249,338	**$332,450**

$85,200= $50,000 x 1.704 represents the dollar equivalent in January 2011 of $50,000 based on inflation increases since 1987. Similarly, $332,450 (=$100,000 x 3.325) represents the dollar equivalent in January 2011 of $100,000 in 1978 based on inflationary increases since the month of January 1978.

* Source: Statistics Canada, Consumer Price Index, monthly CPI release, rolling average (except for Jan. 1978).

Consumer Price Index — Unemployment Rate

From Jan 2010 to Jan 2011* (rates of inflation)		For the month of January 2011	
Canada**	2.3%	Canada:	7.8%
Vancouver:	2.4%	Vancouver:	7.4%
Toronto:	2.6%	Toronto:	8.3%
Edmonton:	1.2%	Edmonton:	5.8%
Calgary:	0.7%	Calgary:	6.0%
Halifax:	2.8%	Halifax:	6.7%
St. John's, NF:	2.3%	St. John's, NF:	7.1%
Saint John, NB:	1.6%	Saint John, NB:	6.1%
Charlottetown:	1.2%	Charlottetown (PEI):	11.3%

* Using month-over-month indices. Source: Statistics Canada

** 12 month rolling average up to January 2011 is 1.8% (see table above).

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