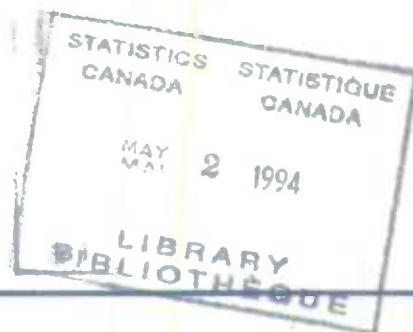


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**Estimating Total Annual Hours Worked
from the Canadian Labour Force Survey**

**By
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51

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Note: This paper was prepared jointly by Labour and Household Surveys Analysis Division and Input/Output Division.

INTRODUCTION

1. This paper illustrates how total annual hours worked can be derived from a periodic household survey, in this instance the Canadian Labour Force Survey. A number of the techniques described and used in this document have been developed by the Productivity Measures of Statistics Canada. In preparing estimates of labour input for productivity measures, a number of data sources, including the Labour Force Survey, are used. Since this paper serves to show how total annual hours worked estimates can be derived solely from household survey sources, the methodology employed with a view to deriving productivity measures necessarily differs in several important respects from the techniques employed here.

An overview of the survey vehicle

2. The Labour Force Survey (LFS) is one of Canada's major sources of current employment data. The survey universe comprises the civilian, non-institutional population residing in the ten provinces. The sample includes about 55,000 dwellings selected using a stratified, multi-stage design. Interviews are conducted monthly in the selected dwellings, each of which remains in the sample for six months with one sixth of the total being replaced each month. At the first interview, socio-demographic information is collected on all household members and in this, and the subsequent five interviews, labour market information is collected on all civilian members 15 years of age and over.
3. Responses to the LFS questionnaire provide the information required to classify respondents as employed, unemployed or not in the labour force as well as providing a substantial amount of information relating to each of these categories. A respondent is classified as employed if he or she did any work in the reference week (the week prior to the interview), or if he or she had a job or business but was not at work for reasons such as vacation, illness or labour dispute.
4. From January to October, the reference week is mid-month, i.e., the week containing the 15th day. In November and December, both the reference and interview weeks are moved forward by one week. This is done to avoid the operational problems which would arise in conducting interviews in the week prior to Christmas. The November reference is, in turn, moved forward, in order to approximately equalize the between-survey periods.
5. Employed respondents are asked a number of questions on hours of work. Those who did some work in the reference week are asked:
 - the number of hours they usually work per week (recorded in intervals of one hour);

- the number of extra hours, if any, they worked in the reference week (extra hours refer to hours in excess of the usual hours and are recorded in intervals of one hour);
 - the number of hours, if any, they lost or took off from work in the reference week (hours lost or taken off refer to the number of hours less than the usual hours. They are recorded in intervals of one hour);
 - if any time was lost, the main reason for absence (i.e. the reason accounting for most of the hours);
 - the number of hours actually worked in the reference week (recorded in intervals of one hour).
6. Employed respondents who did not work in the reference week are asked the main reason for their absence and the number of hours they usually work per week. In the case of these persons who are absent all week, the reported usual weekly hours can be taken to represent the number of hours lost in the reference week. At a conceptual level, this is equivalent to the hours lost data on persons who worked at least part of the reference week.
7. Thus, the LFS provides data on usual weekly hours, actual weekly hours, extra time and time lost. The data can be generated and used in several forms including:
- intervals of hours worked or hours lost, e.g., the number of persons working 1-10 hours, 11-20 hours, etc. These intervals can be defined to suit the specific requirements of each data user;
 - hours worked per employed person, i.e., the average workweek, and average hours lost per employed person or per absent person;
 - total usual and total actual hours worked per week and total hours lost per week (the latter can be generated by reason for absence).
8. These data on hours of work can be cross-tabulated with other data collected by the LFS, for example, industry, occupation and class of worker (i.e., employee, self-employed, unpaid family worker). They can also be related to the full range of socio-demographic variables, that is age, sex, marital status, relationship to family head and educational attainment.
9. This paper centres on the calculation of total annual hours worked. As such, the focus is primarily on the total actual hours worked estimates and selected measures of time lost.

10. Table 1 shows the estimates of total actual hours worked in the survey's reference week, by month, for 1975 to 1981¹. The annual averages, also shown in Table 1, can be taken to represent the "average week" of the year in question and one can derive an estimate of total annual hours worked simply by multiplying the annual averages by 52. This yields the following estimates of total annual hours worked for 1975 to 1981:

Year	<u>Annual average hours worked</u> <u>per week X 52 (in millions)</u>
1975	17,367
1976	17,427
1977	17,738
1978	18,511
1979	19,267
1980	19,470
1981	19,691

11. The problem with this simple approach is that these estimates are based on the hours worked in only one week in each month (the reference week), and this week is not necessarily representative of the whole month. For example, public holidays are not evenly dispersed throughout the month and, labour disputes may or may not be evenly distributed. Such events have a substantial impact on the hours lost, and therefore on the total hours worked, in the week in which they occur. If such events occur disproportionately in the 12 reference weeks, compared to the other 40 weeks in the year, the simple method of estimating total annual hours worked described above could be unreliable. The balance of this paper is directed at an investigation of this problem and suggests some ways of overcoming it. Possible adjustments, which deal with the impact of time lost due to labour disputes, and time lost due to public holidays will be described.
12. To put the hours lost attributable to these two reasons in context, Table 2 provides estimates of time lost by reason for absence. These are weekly averages for each year from 1975 to 1981. The range in average hours lost per week due to labour dispute in the period under review is pronounced, owing mainly to the 1977 estimate which is markedly below the estimates obtained in other years. Given the fairly stable estimates for these other years, 1977 simply look "out of line". However, as will be shown below, estimates from an independent source substantiate the validity of this particular observation.

¹ The LFS underwent a major revision in 1975. The data used in this paper were either not collected at all, or not collected in a compatible form, prior to 1975.

13. As for hours lost due to holidays, Table 2 shows very large annual fluctuations. This is attributable to the fact that the number of public holidays falling in reference weeks varies from year to year. The discussion below will address the question of how to obtain an estimate of annual hours worked which reasonably reflects time lost due to public holidays throughout the entire year, whether or not they happen to fall in a survey reference week.

An overview of the approach

14. Recognizing that the LFS produces total actual hours worked estimates for only 12 of the 52 weeks of the year, the solution might appear to be to estimate hours worked in the remaining 40 weeks through interpolation and adjustment and to derive annual hours worked by aggregating over these 40 weeks and adding in the 12 observations from the LFS. To some extent, this is in fact the approach taken but with the adjustment for labour disputes being performed on a monthly basis.
15. The overall technique, which is described in more detail subsequently, proceeds in essentially five stages.
 - (1) The estimates of actual hours worked in the LFS reference weeks are inflated by adding back in hours lost due to selected holidays and hours lost due to labour disputes.
 - (2) The estimates from Stage (1) are used to create estimates for the remaining 40 weeks by interpolation.
 - (3) The holiday adjustment is applied to the estimates for the 40 weeks derived from Stage (2).
 - (4) The 12 LFS estimates, with the impact of selected holidays removed, are grouped with the other 40 estimates.
 - (5) The 52 LFS and interpolated estimates are aggregated to form 12 monthly estimates. The monthly estimates reflect a combination of actual hours worked and hours lost due to labour disputes.
 - (6) Monthly estimates of hours lost due to labour disputes, which are obtained from Labour Canada, are subtracted from the monthly estimates obtained in Stage (5). At this point, the process has generated monthly estimates of actual hours worked, that is, estimates from which hours lost from all sources have been removed.

- (7) Annual aggregate hours worked estimates are obtained simply by aggregating over the 12 monthly estimates.

The application of these steps to 1981 data is illustrated in Table 5.

Public holidays

16. In most years, two national public holidays will fall in the LFS reference weeks. These are Thanksgiving and Remembrance Day. In some cases, holidays in the reference week result in up to 50 million hours lost. In such months, hours worked in the reference week are clearly not typical of the rest of the month. On the other hand, a number of important public holidays never fall in the reference week. For months containing holidays outside the reference week, the LFS estimate of total hours worked in the reference week will exceed the true weekly average for the month.
17. It should be noted that LFS estimates show some time lost due to public holidays in each and every reference week. This can be attributed to the fact that there are many provincial holidays, local holidays, and feast holidays of specific religious groups spread throughout the year. Because the holidays are so widely dispersed through time, it is not unreasonable to assume that the reference week data will be sufficiently representative of the other weeks in the month. What is of concern here are those holidays which have a discernible impact at the national level. These are generally "national" public holidays, but there are a few regional holidays, celebrated in one or more of the most populous provinces, which can have an impact at the national level.
18. Data from the Pay Research Bureau² make it possible to divide important public holidays into three broad groups in terms of the proportion of employees granted the day off:

Major holidays:	New Year's Day
	Good Friday
	Canada Day (July 1)
	Labour Day (first Monday in September)
	Thanksgiving Day (generally second Monday in October)
	Christmas Day

² The Pay Research Bureau is an arm of the federal government's Public Service Staff Relations Board. The bureau conducts surveys in private industry to determine equitable wage and benefit packages for federal public servants.

Major-minor holidays*: Victoria Day (generally the Monday closest to May 24)
Boxing Day

Minor holidays: Easter Monday
St-Jean Baptiste (June 24)
August Civic Holiday (first Monday in August)
Remembrance Day

* These can be considered as roughly half-way between major and minor holidays in terms of their impact on hours.

From 1975 to 1982, 20 of the 96 reference weeks contained one of these holidays where the holidays concerned have been Good Friday, Easter Monday, Thanksgiving Day or Remembrance Day. The mid-month location of the reference week precludes the remaining holidays from ever falling in a reference week.

19. Table 3 shows actual hours worked in those reference weeks containing holidays (Column 1) with the hours lost through labour disputes added back in as outlined in paragraph 15. Column 2 shows hours lost due to public holiday, as estimated by the LFS. Column 3 is the sum of Columns 1 and 2 and is intended to represent the hours that would have been worked had there been no holiday. Column 4 represents the impact of the holiday, in terms of the ratio of hours worked to the hours that would have been worked had there been no holiday. These holiday adjustment ratios are summarized below:

Ratio of Hours Worked to Hours that would have been Worked had Reference Week not Contained a Holiday, 1975-1981

Reference week containing:				
	Good Friday	Easter Monday	Thanksgiving Day	Remembrance Day
1975			.8948	.9505
1976	.8810		.8728	.9448
1977		.9541	.8816	.9405
1978			.8804	.9937
1979		.9556		.9707
1980			.8800	.9441
1981	.8734		.8718	.9437

The ratios shown above refer to two major holidays (Good Friday and Thanksgiving Day) and two minor holidays (Easter Monday and Remembrance Day). Among the major holidays, the ratios range from a high of .8948 to a low of .8718. Thus, Good Friday and Thanksgiving Day are essentially similar in terms of their impact on hours worked. The importance of particular holidays can rise or fall but there is no strong indication of trend changes in the limited number of available observations.

20. Among the ratios for minor holidays, there are two outliers - Remembrance Day in 1978 and 1979 - but the remaining ratios range narrowly from .9573 to .9405. Remembrance Day differs from other holidays in that, when it falls on a normal day of rest, a large proportion of employees are not granted another day (e.g. the following Monday) off in lieu. In 1978, Remembrance Day fell on a Saturday, i.e., the last day of reference week and the LFS estimate of hours lost due to holiday was 2.3 million, compared to a mean of 19.3 million in the three preceding years. In 1979, Remembrance Day fell on a Sunday and the number of hours lost rose to 11.4 million. One can safely assume that most of these hours were lost by persons granted the Monday off. In the absence of information to the contrary, the 1979 ratio could be considered appropriate when Remembrance Day falls on a weekend.
21. To summarize the presentation on the impact of holidays:
 - the two major holidays have a similar impact on reference week hours, which is to reduce them to about .88 (the mean) of the level they would have reached had there been no holiday;
 - with the exception of Remembrance Day which falls on a weekend, the two minor holidays have a similar impact on reference week hours, which is to reduce them to about .95 of the level they would have otherwise reached;
 - when Remembrance Day falls on a weekend, the impact is smaller. The hours worked represent about .97 of the level they would have otherwise reached;
 - the above ratios have been fairly stable during the period under review.
22. A holiday adjustment can be executed by following these steps.
(The full process is illustrated in Table 5):
 1. Add the hours lost due to labour disputes back into the actual hours worked estimates (Column 2 of Table 5).
 2. Add the hours lost due to holidays back into the actual hours worked estimates (Column 5 of Table 5).

3. Interpolate weekly hours worked estimates for weeks between reference weeks using a simple linear interpolation (Column 6).
4. Adjust the interpolated hours in non-reference weeks containing important holidays. These holidays are identified by type in Column 7. The adjustment factor for non-reference weeks containing major holidays is .88 (i.e., the adjustment factor is based on the observed effect of major holidays falling in the reference week). For minor holidays, a factor of .95 is used. For major-minor holidays, the impact is assumed to be half-way between that of a major and a minor holiday and, accordingly, a factor of .92 is used.
5. Where the reference week contains a holiday, there is no need to apply and adjustment factor to the estimated hours worked for that week. In Column 9, which contains "total hours worked adjusted for holidays", the Column 3 estimate can be used since this reflect the observed impact of the holiday.
6. Column 9 represents weekly hours levels adjusted for holidays but not for labour disputes.

Labour disputes

23. Labour Canada, another department of the federal government, publishes a wide selection of statistics relating to work stoppages. The information is obtained from administrative rather than household survey sources. One of the series pertains to person-days lost through work stoppages calculated by month. Table 4 provides a comparison of the labour Canada and LFS data on time lost due to labour disputes. The Labour Canada person-day figures have been multiplied by 8 (Column 2 of Table 4) to obtain estimated in terms of hours lost. (The assumption of an 8 hour working day is, admittedly, somewhat arbitrary. However, the 40 hour/5 day week is still the most frequently occurring work schedule in Canada, particularly in industries which are highly unionized³). One would expect the administrative data to be roughly four times larger than the LFS estimates, since the former refer to the full month and the latter to one week within the month. (The average month contains 4.3 weeks).

³ A special survey, conducted as a supplement to the LFS, showed that in 1981, 60.4% of all jobs held that year involved an 8 hour day. For further information see, "Work Schedules in 1981: Results of a Special Survey," *The Labour Force*, (Statistics Canada, Catalogue No. 71-001), October 1982.

24. Table 4 shows that, on an annual average basis, the LFS estimate represents from 20% to 26% of the Labour Canada figure converted to hours. On the whole, the agreement is remarkably good. It was noted earlier that hours lost per week in 1977, as measured by the LFS, appeared to be "out of line" with the estimates of other years. The Labour Canada data indicate that 1977 was in fact an exceptional year in terms of time lost due to labour disputes:

<u>Year</u>	<u>Person-days lost in year</u>
1975	10,908,810
1976	11,609,890
1977	3,307,880
1978	7,392,820
1979	7,834,230
1980	8,975,390
1981	8,878,490

Source: Strikes and Lockouts in Canada, 1981, Labour Canada. (Canadian Government Publishing Centre, Supply and Services Canada), Ottawa.

While the LFS annual averages appear to adequately reflect time lost due to labour disputes, it can be seen from Table 4 that this does not always apply to the monthly data. LFS hours lost due to labour disputes can represent any-where from 9.4% (November 1979) to 37.3% (November 1976) of Labour Canada's person-day figure converted to hours. This variation is evidence that the occurrence of labour disputes is not evenly distributed throughout the month. However, the average degree of consistency can be taken as evidence of the reliability of the LFS estimates of the time lost due to labour disputes which occur during the reference week. Some confidence can, therefore, be placed in the step in which hours lost due to labour disputes are added back into the actual hours worked estimated before the application of the holiday adjustment.

25. After the interpolation of hours worked in non-reference weeks and after the adjustment for time lost due to public holidays have been effected, the Labour Canada based estimates of hours lost due to labour disputes are subtracted from the estimated hours worked. It may be noted that, if the Labour Canada data were not available, the Survey estimate of hours lost due to labour disputes could be used in this last step.

Effect of the adjustments

26. The procedure described above has also been applied to the data for 1976 through 1980 to derive annual hours worked estimates for all of these years. The impact of the adjustments on total annual hours worked is summarized in Table 6. It can be seen that the adjustments raise the estimated hours worked in three years, by 63 to 274 million hours, and lower them in the remaining three years, by 112 to 284 million hours. In percentage terms, the adjusted values represent from - 1.0 to + 1.5 of the simple "average week" based values (Column 1 of Table 6). There are many assumptions and approximations built into the adjustment procedures and there are also sampling and non-sampling errors in the original data being adjusted. For some purposes, the unadjusted survey results could be preferred on the grounds that the impact of adjustment is too slight, given the errors inherent in the original data and nature of the adjustment procedure. On the other hand, for the data user interested in measures of year-to-year changes in aggregate annual hours worked, the adjustments have a substantial impact as displayed in Table 6. Whether or not the adjustments increase the accuracy of the resulting statistics remains to be determined. The obvious standard of comparison would be the aggregate annual hours worked estimates produced by Statistics Canada for the purposes of measuring productivity. However, those estimates exclude a substantial number of very specific industries and the time had not been available to generate LFS based measures of hours worked with the same coverage in order to carry out a valid comparison.
27. The adjustments may also have more impact on disaggregated data, for example, industry - or occupation-specific estimates of total annual hours worked. The adjustment procedure described above was applied to four different industries, using 1981 data. The holiday adjustment factors, for the four industries in question, are as follows:

	Major holidays	Minor holidays	Major-minor holidays
Manufacturing	.85	.96	.91
Construction	.87	.95	.91
Trade	.88	.96	.92
Public Administration	.84	.88	.86

Labour Canada data show that the percentage of estimated working time lost through work stoppages in 1981 ranged from .03 in construction, to .04 in trade, to .38 in public administration and to .89 in manufacturing. In spite of the range in the holiday adjustment factors, and the even greater range in the industry-specific time lost due to labour disputes statistics, the impact of the adjustment was quite uniform by industry as shown in Table 7.

Other limitations of the data

28. There are other limitations of the LFS as a source of aggregate annual hours worked estimates which should be recognized. These include the occurrence of absences for more than one reason in a single reference week, assumptions regarding the distribution through time of absences due to reasons other than holiday or labour dispute, and problems with industry-specific estimates in the case of persons with more than one job in the reference week.

1. Multiple absences

Whether the respondent was absent from work for part of the reference or all of that week, only one reason can be recorded. In the event that the respondent was absent for more than one reason, the interviewers are instructed to enter the total hours lost for all reasons and specify as a reason the one which accounted for the largest number of hours of lost time. When neither holidays nor labour disputes are involved, the occurrence of more than one absence for more than one reason poses no problem for the present purposes. However, when one of the reasons is holiday or labour dispute, the consequences are potentially more serious. For example, when the occurrence of a holiday in a reference week prompts a significant number of persons to take all or part of the balance of the week as vacation (annual leave) two results can be anticipated. First, when the vacation time is larger than the holiday time, the occurrence of the holiday will go undetected among the affected respondents since all of the time lost will be attributed to the vacation. Secondly, under these circumstances, the time lost due to vacation in the reference week will probably not be representative of time lost for this reason in the remaining weeks of the month.

2. Absence for other reasons

In the technique for estimating annual aggregate hours worked presented in this paper, reasons for absence other than holidays or labour disputes are assumed to be uniformly distributed throughout the month. For absences due to illness or family responsibilities there is little reason to question the validity of this assumption. For other absences due to factors such as starting or leaving a job during the reference week, working short time, etc., at least the possibility exists that the absences may be concentrated in particular weeks of the month. The comment made above regarding possible

interactions between holidays and vacations illustrates the point. In addition, time lost due to starting or losing a job mid-week may be more prevalent during weeks at the beginning or end of a month. Unfortunately no data exist which could be used to assess the extent to which this in fact occurs.

3. Multiple job holding

In the LFS, persons holding two or more jobs in the reference week are identified and the hours worked at the 'main job' and 'other job' are measured separately. (The 'main job' is the one at which the respondent usually works the most hours). When measuring aggregate annual hours worked for all employed persons, the occurrence of multiple job holding poses no problems. However, when these hours are estimated by industry, the fact that the LFS identifies only the industry of the 'main job' makes it difficult to correctly attribute the hours worked in the 'other jobs' to the appropriate industry. Since, in Canada, multiple job holders constitute something in the order of 3% of all employed persons, this is not a trivial problem. However, a special survey conducted as a supplement to the LFS should provided some measures of the industrial distributions of 'main' and 'other' jobs leading to the potential for at least crude adjustments for this problem.

Alternative approaches

29. The techniques used in this paper to estimate total annual hours worked are based fundamentally on LFS data although two additional independent sources are brought to bear on the process, namely, information on the coverage of holidays, and time lost due to labour disputes.
30. It is possible, of course, to base the annual hours worked estimates even more completely on household survey sources. In the case of holidays, what might be described as "common knowledge" concerning their occurrence, combined with the information on hours lost derived from the LFS when a holiday coincides with the reference week, could form a reasonable basis for the holiday adjustment. With respect to the adjustment for hours lost due to labour disputes, the average consistency between the LFS estimates and those from administrative sources, suggests that an acceptably sound adjustment can be performed. This would be accomplished by estimating hours lost due to labour disputes for the entire year (calculated as the average of the twelve observations times 52) and deducting this from the aggregate of the monthly hours worked estimates.

Conclusion

31. In a complex, multi-faceted statistical system, using household and establishment surveys as well as administrative sources, it is clearly inadvisable to place total reliance on household surveys for estimating total annual hours worked. It is for that reason - as mentioned in the introduction - that the Productivity measures of Statistics Canada uses an optimal combination of data series. Nevertheless, as this paper has shown, it is possible to generate plausible aggregate estimates from household surveys alone.

TABLE 1. Total Actual Hours Worked in Reference Week, by Month, 1975-1981

	1975	1976	1977	1978	1979	1980	1981
January	332,136	329,984	321,624	328,808	352,529	365,062	373,487
February	320,870	329,078	330,692	338,911	353,101	363,587	377,013
March	322,401	328,558	330,568	341,360	358,396	364,498	377,835
April	333,223	299,513	324,515	350,316	344,899	375,592	333,880
May	353,589	357,243	360,366	372,336	385,312	391,566	404,492
June	359,781	363,001	368,996	380,526	396,407	400,731	415,620
July	315,601	330,330	336,092	351,584	346,462	356,265	369,168
August	332,178	345,798	351,059	362,194	375,765	375,414	385,797
September	356,655	356,999	364,677	374,026	392,072	395,353	405,291
October	315,329	306,229	322,980	333,627	390,139	349,430	347,809
November	330,559	330,043	337,662	369,582	372,974	369,321	370,548
December	344,518	344,886	344,052	368,590	378,138	386,267	383,113
Annual average	333,987	335,139	341,107	355,988	370,516	374,424	378,671

TABLE 2. Total Hours Lost Per Week by Reason for Absence, 1975-1981*

	Total hours lost	Hours lost per week due to:						
		Illness or disability	Personal or family responsibilities	Short-time and turnover	Labour dispute	Vacation	Public holiday	Other reasons
1975	38,382	8,579	1,791	1,721	1,728	17,099	4,716	2,729
1976	42,526	8,754	1,750	1,666	1,779	17,022	8,874	2,681
1977	41,117	8,562	1,768	1,839	479	17,234	6,884	4,351
1978	39,266	9,325	1,878	1,776	1,028	17,239	4,124	3,896
1979	40,307	9,306	2,419	1,677	1,130	19,386	2,374	4,016
1980	44,480	9,782	2,515	1,832	1,234	19,486	5,910	3,722
1981	50,037	9,515	2,731	1,892	1,556	20,227	10,289	3,828

* These estimates represent the average of the number of hours lost in the 12 reference weeks of each year.

TABLE 3. Reference Weeks Containing Important Holidays, 1975 to 1982

	Column 1	Column 2	Column 3	
	Total hours worked (incl. hours lost through labour disputes)	Hours lost due to holiday	Hours that would have been worked except for the holiday (Col. 1 + 2)	Ratio of column 1 to column 3
	'000	'000	'000	
<u>1975</u>				
October (Thanksgiving)	317,330	37,285	354,615	.8949
November (Remembrance)	333,308	17,324	350,632	.9506
<u>1976</u>				
April (Good Friday)	300,807	40,617	341,424	.8810
October (Thanksgiving)	309,708	45,123	354,831	.8728
November (Remembrance)	331,533	19,358	350,891	.9448
<u>1977</u>				
April (Easter Monday)	325,173	15,609	340,782	.9542
October (Thanksgiving)	323,391	43,397	366,788	.8817
November (Remembrance)	337,917	21,352	359,269	.9406
<u>1978</u>				
October (Thanksgiving)	334,706	45,470	380,176	.8804
November (Remembrance)	370,451	2,274	372,725	.9939
<u>1979</u>				
April (Easter Monday)	346,338	16,104	362,442	.9556
November (Remembrance)	373,482	11,353	384,835	.9705
<u>1980</u>				
October (Thanksgiving)	350,243	47,750	397,993	.8800
November (Remembrance)	370,047	21,915	391,962	.9441
<u>1981</u>				
April (Good Friday)	334,933	48,560	383,493	.8734
October (Thanksgiving)	348,973	51,338	400,311	.8718
November (Remembrance)	371,411	22,176	393,587	.9437
<u>1982</u>				
April (Easter Monday)	350,526	15,630	366,156	.9573
October (Thanksgiving)	330,421	47,048	377,469	.8754
November (Remembrance)	346,936	21,540	368,476	.9415

TABLE 4. Comparison of Labour Canada and LFS Data on Time Lost Through Labour disputes, 1975-1981

	Person-days lost in month (Labour Canada)	Person-days lost converted to hours (X 8)	Hours lost in reference	Column 3 as % of column 2
		'000	'000	%
1975				
January	409,800	3,278	728	22.2
February	361,050	2,888	606	21.0
March	479,530	3,836	1,016	26.5
April	559,230	4,474	931	20.8
May	692,430	5,539	1,371	24.8
June	804,660	6,437	1,820	28.3
July	1,237,580	9,901	2,383	24.1
August	1,293,570	10,349	2,729	26.4
September	1,273,870	10,191	2,547	25.0
October	1,277,260	10,218	2,001	19.6
November	1,420,520	11,364	2,749	24.2
December	1,099,310	8,794	1,861	21.2
Annual avg.	-	7,273	1,728	23.8
1976				
January	818,960	6,552	1,497	22.8
February	563,750	4,510	965	21.4
March	448,590	3,589	825	23.0
April	709,760	5,678	1,294	22.8
May	660,510	5,284	978	18.5
June	1,224,180	9,793	1,931	19.7
July	1,270,240	10,162	2,353	23.2
August	1,186,600	9,493	1,712	18.0
September	1,943,860	15,551	4,366	28.1
October	2,035,720	16,286	3,479	21.4
November	498,700	3,990	1,490	37.3
December	249,020	1,992	464	23.3
Annual avg.	-	7,740	1,779	23.0
1977				
January	219,000	1,752	478	27.3
February	175,740	1,406	395	28.1
March	207,270	1,658	432	26.1
April	329,350	2,635	658	25.0
May	299,940	2,400	287	12.0
June	307,500	2,460	470	19.1
July	405,760	3,246	628	19.4
August	345,970	2,768	582	21.0
September	245,070	1,961	488	24.9
October	178,300	1,426	411	28.8
November	240,850	1,927	255	13.2
December	353,130	2,825	658	23.3
Annual avg.	-	2,205	479	21.7
1978				
January	375,920	3,007	637	21.2
February	276,860	2,215	426	19.2
March	402,590	3,221	952	29.6
April	483,020	3,864	847	21.9
May	503,810	4,030	1,036	25.7
June	670,410	5,363	1,198	22.3
July	974,500	7,796	1,612	20.7
August	1,039,290	8,314	1,416	17.0
September	733,880	6,191	1,385	22.4
October	841,670	6,733	1,079	16.0
November	579,760	4,638	869	18.7
December	471,110	3,769	873	23.2
Annual avg.	-	4,929	1,028	20.8

TABLE 4. Comparison of Labour Canada and LFS Data on Time Lost Through Labour disputes, 1975-1981

	Person-days lost in month (Labour Canada)	Person-days lost converted to hours (X 8)	Hours lost in reference	Column 3 as % of column 2
		'000	'000	%
1979				
January	528,460	4,228	729	17.2
February	472,060	3,776	774	20.5
March	678,610	5,429	1,164	21.4
April	680,090	5,441	1,439	26.5
May	756,380	6,051	1,276	21.1
June	868,740	6,950	1,654	23.8
July	782,750	6,262	1,854	29.6
August	899,240	7,194	1,724	24.0
September	416,570	3,333	685	20.5
October	623,140	4,985	710	14.2
November	673,970	5,392	508	9.4
December	454,220	3,634	1,044	28.7
Annual avg.	-	5,223	1,130	21.6
1980				
January	690,170	5,521	649	11.8
February	1,121,750	8,974	2,357	26.3
March	588,050	4,704	1,038	22.1
April	616,250	4,930	1,086	22.0
May	686,650	5,493	955	17.4
June	817,000	6,536	1,511	23.1
July	1,061,420	8,491	1,665	19.6
August	998,260	7,986	1,851	23.2
September	817,350	6,539	1,431	21.9
October	779,490	6,236	813	13.0
November	466,070	3,729	726	19.5
December	332,930	2,663	721	27.1
Annual avg.	-	5,984	1,234	20.6
1981				
January	351,490	2,812	535	19.0
February	698,370	5,587	1,456	26.1
March	779,320	6,235	1,366	21.9
April	562,730	4,502	1,053	23.4
May	457,040	3,656	794	21.7
June	493,570	3,949	844	21.4
July	1,769,910	14,159	4,387	31.0
August	1,685,260	13,482	4,161	30.9
September	684,850	5,479	1,729	31.6
October	654,760	5,238	1,164	22.2
November	545,920	4,367	863	19.7
December	195,270	1,562	323	20.7
Annual avg.	-	5,919	1,556	26.3

Table 5. Summary of Adjustments to LFS Data on Total Hours Worked, 1981

		Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	
		LFS refer- ence week	Total hours worked	Hours lost to labour dispute	Column 1 + Column 2	Hours lost due to holiday	Column 3 + Column 4	Interpo- lated hours in non- reference week	Holidays by type	Holiday adjust- ment factors	Total hours worked adjusted for holidays	Person- days lost through labour dis- pute X 8	Final adjusted hours in month (Column 9 - column 10)
thousands													
Week ending:													
(1980)	December												
7-13		X	386,267	721	386,988	N/A	386,988						
14-20								384,395					
21-27								381,802					
(1981)													
January													
28-3								379,209	Major	.88	333,704		
4-10								376,616			376,616		
11-17		X	373,487	535	374,022	N/A	374,022				374,022	2,812	1,832,241
18-24								374,911			374,911		
25-31								375,800			375,800		
February													
1-7								376,689			376,689		
8-14								377,578			377,578	5,587	1,505,801
15-21		X	377,013	1,456	378,469	N/A	378,469				378,469		
22-28								378,652			378,652		
March													
1-7								378,835			378,835		
8-14								379,018			379,018	6,235	1,511,093
15-21		X	377,835	1,366	379,201	N/A	379,201				379,201		
22-28								380,274			380,274		
April													
29-4								381,347			381,347		
5-11								382,420			383,420	4,502	1,464,692
12-18		X	333,880	1,053	334,933	48,560	383,493		Major	N/A	334,933		
19-25								388,941	Minor	.95	369,494		
May													
26-2								394,389			394,389		
3-9								399,837			399,837		
10-16		X	404,492	794	405,286	N/A	405,286				405,286	3,656	1,980,355
17-23								407,522			407,522		
24-30								409,758	Major-Minor	.92	376,977		

Table 5. Summary of Adjustments to LFS Data on Total Hours Worked, 1981 (continued)

	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
LFS refer- ence week	Total hours worked	Hours lost to labour dispute	Column 1 + Column 2	Hours lost due to holiday	Column 3 + Column 4	Interpo- lated hours in non- reference week	Holidays by type	Holiday adjust- ment factors	Total hours worked adjusted for holidays	Person- days lost through labour dis- pute X 8	Final adjusted hours in month (Column 9 + column 10)
thousands											
Week ending: (1981) June											
31-6						411,994			411,994		
7-13						414,230			414,230	3,949	1,624,189
14-20	X	415,620	844	416,464	N/A	416,464			416,464		
21-27						405,737	Minor	.95	385,450		
July											
28-4						395,010	Major	.88	347,609		
5-11						384,283			384,283	14,159	1,468,944
12-18	X	369,168	4,387	373,555	N/A	373,555			373,555		
19-25						377,656			377,656		
August											
26-1						381,757			381,757		
2-8						385,858	Minor	.95	366,565		
9-15	X	385,797	4,161	389,958	N/A	389,958			389,958	13,482	1,914,950
16-22						393,370			393,370		
23-29						396,782			396,782		
September											
30-5						400,194			400,194		
6-12						403,606	Major	.88	355,173	5,479	1,562,251
13-19	X	405,291	1,729	407,020	N/A	407,020			407,020		
20-26						405,343			405,343		
October											
27-3						403,666			403,666		
4-10						401,989			401,989		
11-17	X	347,809	1,164	348,973	51,338	400,311	Major	N/A	348,973	5,238	1,944,969
18-24						398,630			398,630		
25-31						396,949			396,949		
						395,268			395,268		
November											
1-7											
8-14	X	370,548	863	371,411	22,176	393,587	Minor	N/A	371,411	4,367	1,541,872
15-21						391,049			391,049		
22-28						388,511			388,511		

Table 5. Summary of Adjustments to LFS Data on Total Hours Worked, 1981 (continued)

		<u>Col. 1</u>	<u>Col. 2</u>	<u>Col. 3</u>	<u>Col. 4</u>	<u>Col. 5</u>	<u>Col. 6</u>	<u>Col. 7</u>	<u>Col. 8</u>	<u>Col. 9</u>	<u>Col. 10</u>	<u>Col. 11</u>
	LFS refer- ence week	Total hours worked	Hours lost to labour dispute	Column 1 + Column 2	Hours lost due to holiday	Column 3 + Column 4	Interpo- lated hours in non- reference week	Holidays by type	Holiday adjust- ment factors	Total hours worked adjusted for holidays	Person- days lost through labour dis- pute X 8	Final adjusted hours in month (Column 9 - column 10)
thousands												
Week ending:												
(1981) December												
29-5							385,973			385,973		
6-12	X	383,113	323	383,436	N/A	383,436				383,436	1,562	1,451,786
13-19							379,646			379,646		
20-26							375,856	Major & Major-Minor	.88x.92	304,293		
(1982) January												
27-2							372,066					
3-9							368,276					
10-16	X	364,265	220	364,485	N/A	364,485						

TABLE 6. *Impact of Adjusting Hours Worked Data for Hours Lost Due to Labour Disputes and Holidays*

	Column 1	Column 2			Year-to-year increase	
	Average reference week X 52	Total annual hours, after adjustment	Column 2 - column 1	Difference as % of column 1	Column 1	Column 2
	million	million	million	%	%	%
1976	17,427	17,490	+ 63	+ 0.4		
1977	17,738	18,011	+ 273	+ 1.5	+ 1.8	+ 3.0
1978	18,511	18,319	- 192	- 1.0	+ 4.4	+ 1.7
1979	19,267	18,983	- 284	- 1.5	+ 4.1	+ 3.6
1980	19,470	19,358	- 112	- 0.6	+ 1.1	+ 2.0
1981	19,691	19,803	+ 112	+ 0.6	+ 1.1	+ 2.3

TABLE 7. *Impact of Adjusting Hours Worked Data for Hours Lost Due to Labour Disputes and Holidays, 1981, Industry-Specific Data*

	Column 1	Column 2		
	Average reference week X 52	Total annual hours, after adjustment	Column 2 - column 1	Difference as % of column 1
	'000	'000	'000	%
Manufacturing	3,911,310	3,939,539	+ 28,229	+ 0.7
Construction	1,216,527	1,221,394	+ 4,867	+ 0.4
Trade	3,262,177	3,280,677	+ 18,500	+ 0.6
Public administration	1,311,531	1,316,529	+ 4,998	+ 0.4

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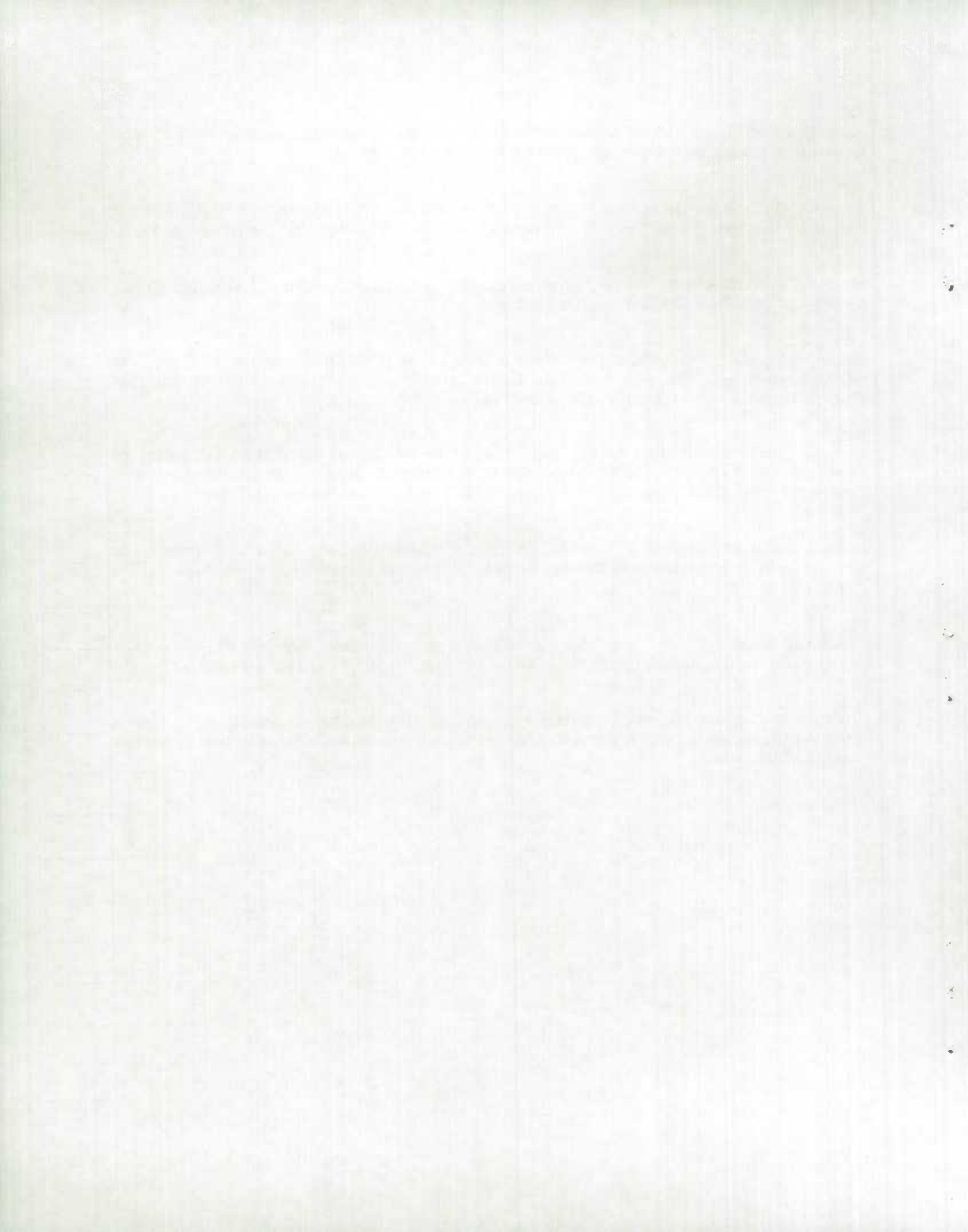
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