

## **MDM4U Final Project Report: INTERNET USE IN CANADA**

### **Introduction**

The Internet has become one of the most widely used tools in many countries worldwide. It now serves many purposes, including e-mail, banking, news, etc... This report will explore many aspects of the use of the Internet by Canadians. How often does the average Canadian use the Internet? For what uses do Canadians use the Internet the most often? What is the profile of a Canadian who is likely to spend a lot of time using the Internet? How has Internet use changed over time? These questions will be answered, along with many others.

### **Sources**

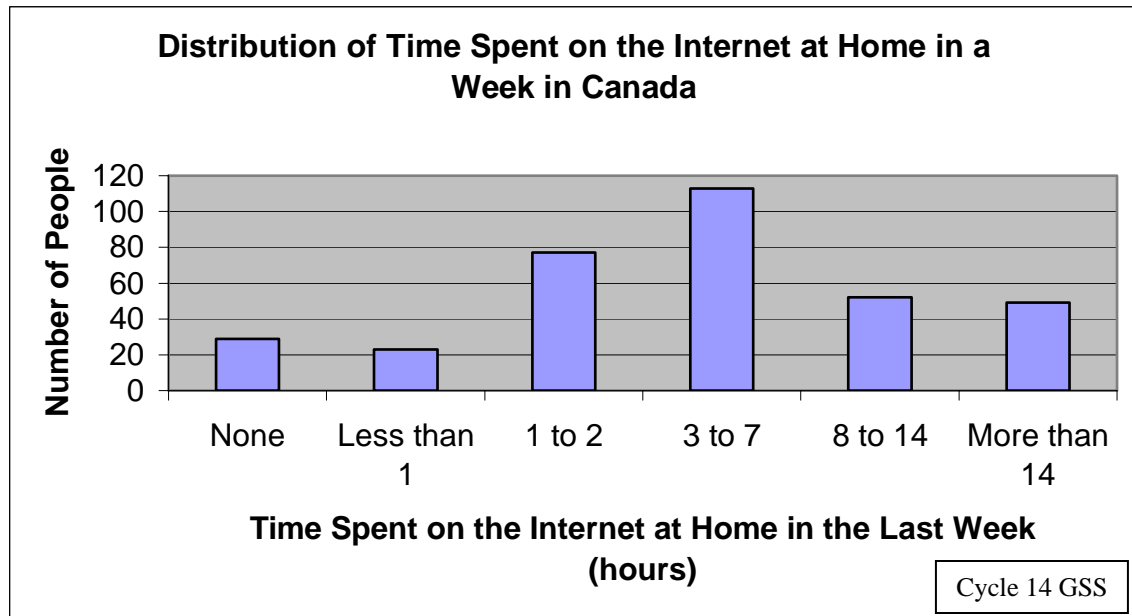
Two major sources of information were consulted during the production of this report:

1. **CANSIM (CANadian Socio-economic Information and Management):**  
This is a database that contains social and economic data from Statistics Canada and other agencies, such as banks. This report utilizes CANSIM Data Tables 358-0002 through 358-0006. These tables, like most CANSIM tables, contain time series to track trends over time. They contain data about the use of the Internet by households. The CANSIM data was extracted from the E-STAT database that is available free to schools at <http://estat.statcan.ca>
2. **Cycle 14 of Statistics Canada's GSS (General Social Survey):**  
Just over 25000 Canadians completed this survey. All conclusions derived from this survey are based on the data from a sample of 1000 of these Canadians. The questions on the survey regarded access to and use of technology, including the Internet.

Biases: The GSS collects its data by telephoning random non-institutionalized Canadians above the age of 15. Unfortunately, not all Canadians are patient enough to complete a survey of this caliber on the telephone. It is also likely that those who did decide to complete the survey were interested in technology. Those who were interested in technology would be more likely to use the Internet. This signifies that many of the statistics determined throughout this report may be too great.

## General Statistics

### Hours of Internet Use at Home:

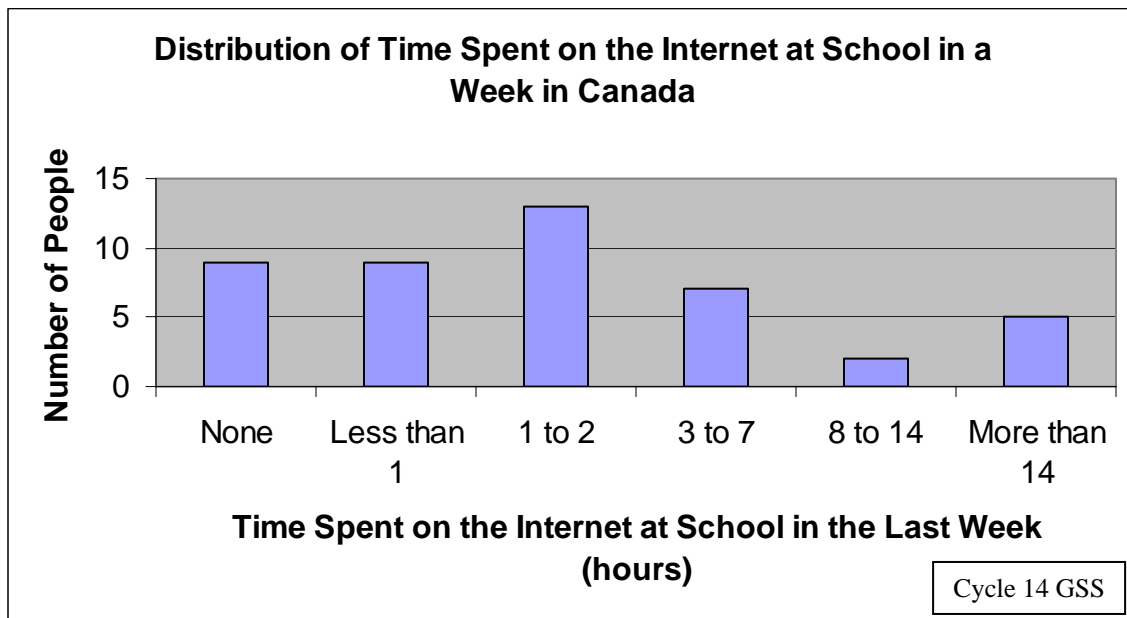


This data could not be displayed on a histogram since the survey allowed answers with different bin widths. “None” has a bin width of zero; “Less than 1” has a bin width of 1; “3 to 7” has a bin width of 4; and “More than 14” has an infinitely large bin width. Most Canadians use the Internet at home between 3 and 7 hours in a week. Few Canadians use the Internet at home for less than one hour or not at all in a week, while a considerable number of Canadians do so for over 8 hours. By using the mean value for each bar (0, 0.5, 1.5, 5, 11, and an estimated 22) all single variable statistics can be calculated (see next page).

The mean number of hours spent using the Internet at home in the week prior to the GSS was approximately 6.8 hours. The standard deviation of this attribute is approximately 7. Since the standard deviation is greater than the mean, it is obvious that there is no normal distribution. A normal distribution requires 68% of the data to be within one standard deviation of the mean; however, approximately 86% of the data is within this range. The median and mode are both 5. Since the median is lesser than the mean, there is a right skew, indicating that there are more people using the Internet at home for less than 5 hours than there are for more than 5 hours.



Hours of Internet Use at School:



For this survey question, the same answers with various bin widths were provided. Thus, once again, a histogram could not be created. Most Canadians who attend school use the Internet at school between 1 and 2 hours in a week. Few use it for over eight hours, while many use it for less than one hour or not at all. The single variable statistics were calculated (see next page).

The trends for the use of the Internet at school are very similar to those of the use of the Internet at home. However, all of the numbers are lower, since the Internet is generally used less at school than at home. The mean number of hours, in this case, is approximately 4.2 hours. This length of time seems much too great to be accurate. The aforementioned bias is likely the cause of this discrepancy. Canadians who attend school are mostly teenagers. It is quite unlikely that a teenager with little interest in technology would complete a survey regarding technology. The teenagers who are interested in technology and who complete the survey are more likely to use the Internet at school.

### Hours of Internet Use at School

Data from cycle 14 of the GSS

Hours	Frequency	Combined Hours	Hours - Mean	Freq * (Hours - Mean) Squared
0	9	0	-4.244444444	162.1377778
0.5	9	4.5	-3.744444444	126.1877778
1.5	13	19.5	-2.744444444	97.91567901
5	7	35	0.755555556	3.996049383
11	2	22	6.755555556	91.27506173
22	5	110	17.75555556	1576.298765
<b>Sum:</b>	45	191	14.53333333	2057.811111

<b>Mean:</b>	4.244444444	<b>Variance:</b>	45.7291358
		<b>Std Dev:</b>	6.762332127

#### Summary:

Sum: 191

Number: 45

Mean: 4.244444444

Median: 1.5

Mode: 1.5

Std Dev: 6.762332127

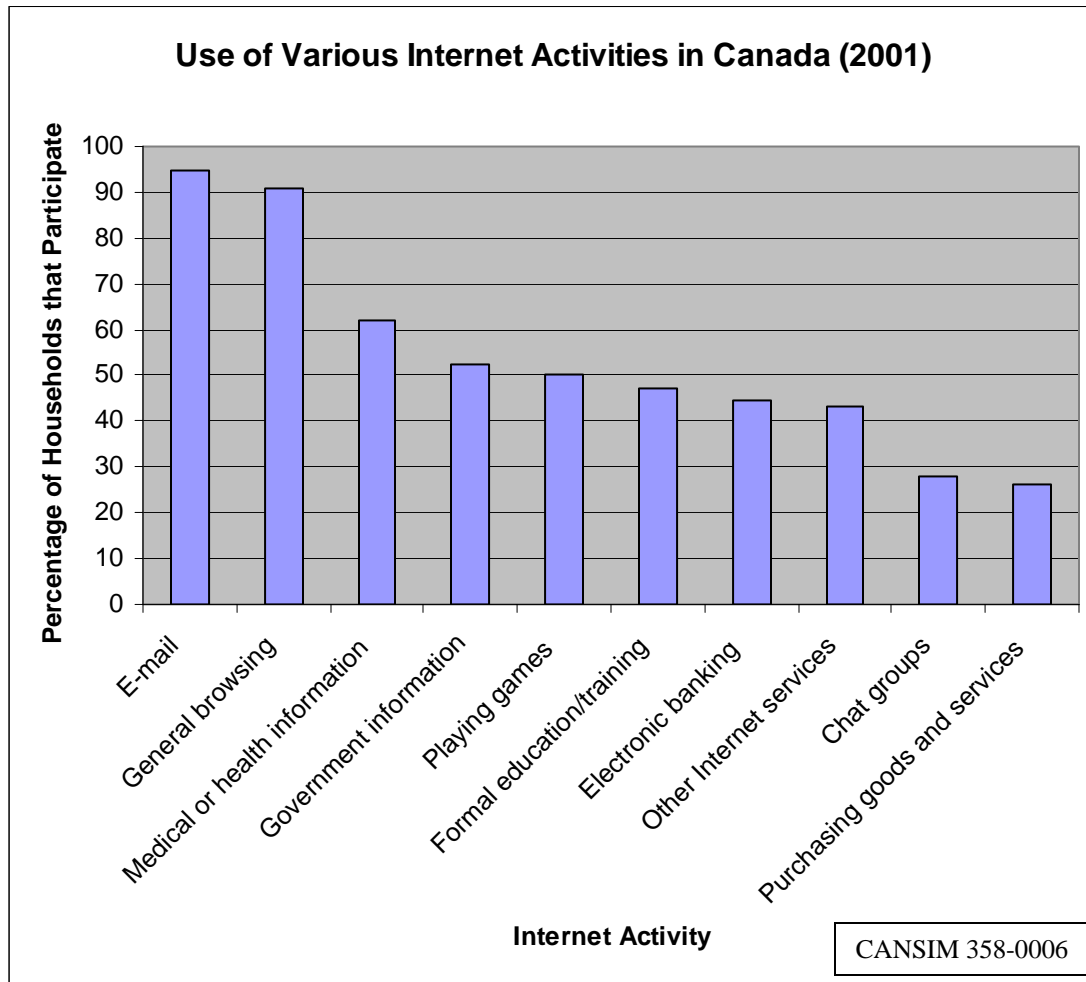
Q2: 1.5

Q1: 0.5

Q3: 5

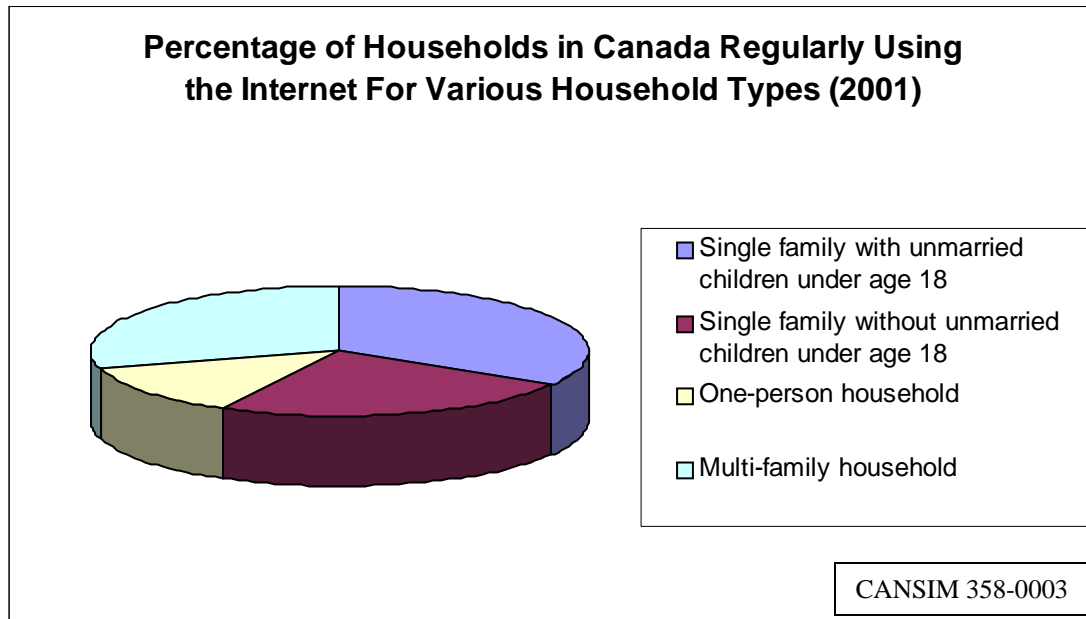
IQR: 4.5

## Uses of the Internet

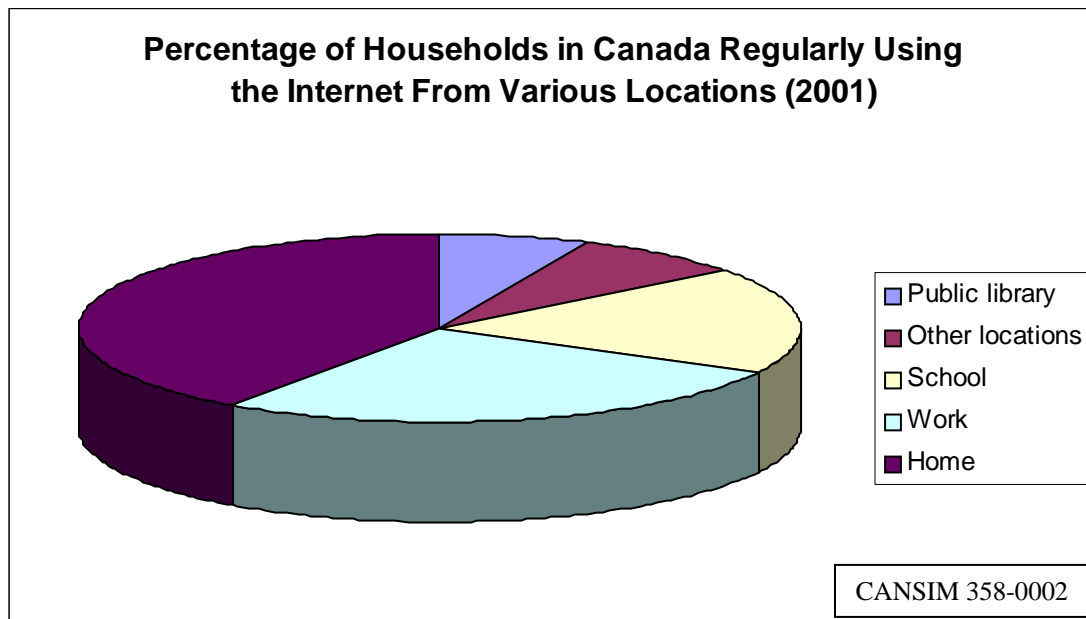


The Internet activity that is participated in by most households is e-mail, which is used by approximately 95% of Canadian households. This is not surprising since e-mail is now one of the leading forms of communication. E-mail is followed closely by general browsing of the World Wide Web. About 50% of Canadian households have someone playing games on the Internet. Only about 26% of households use the Internet to make purchases. This is because many people still believe that the Internet is not secure enough or safe enough to be entrusted with important information.

## Profile of Internet Users

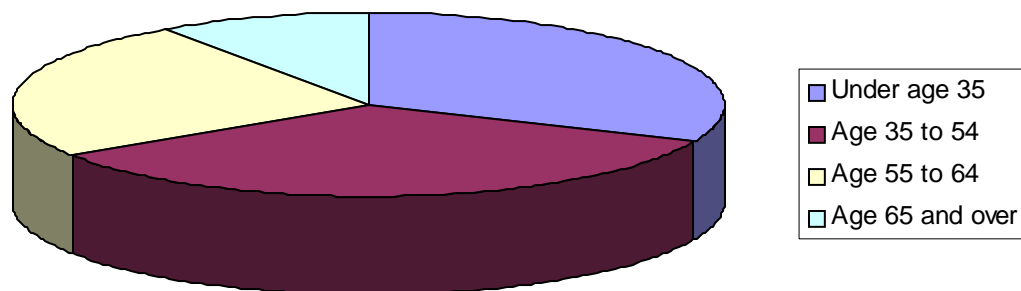


Households with children are the most likely to use the Internet, since today's youth are extremely interested in the Internet. Multi-family households are likely to have residents who are not very financially well off, but since they have many household members, it is still probable that the Internet will be used.



The most likely location for the use of the Internet for a household is at home. It is also common for a member of the household to use the Internet at work. Schools, public libraries, and other locations are not used as often. For a household to use the Internet regularly, it must have access to the Internet at home or at one of its members' work.

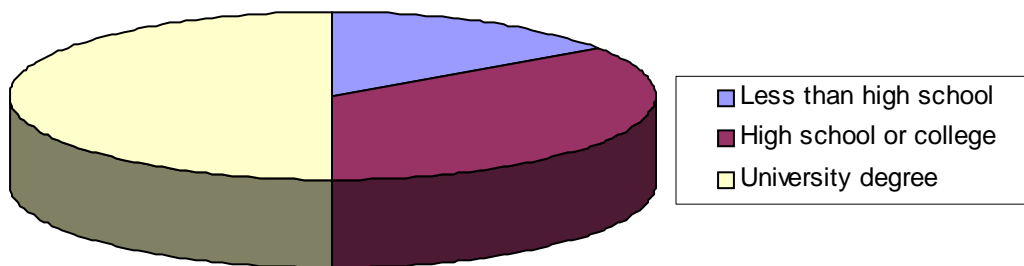
### Percentage of Households in Canada Regularly Using the Internet Based on Age of Household Head (2001)



CANSIM 358-0004

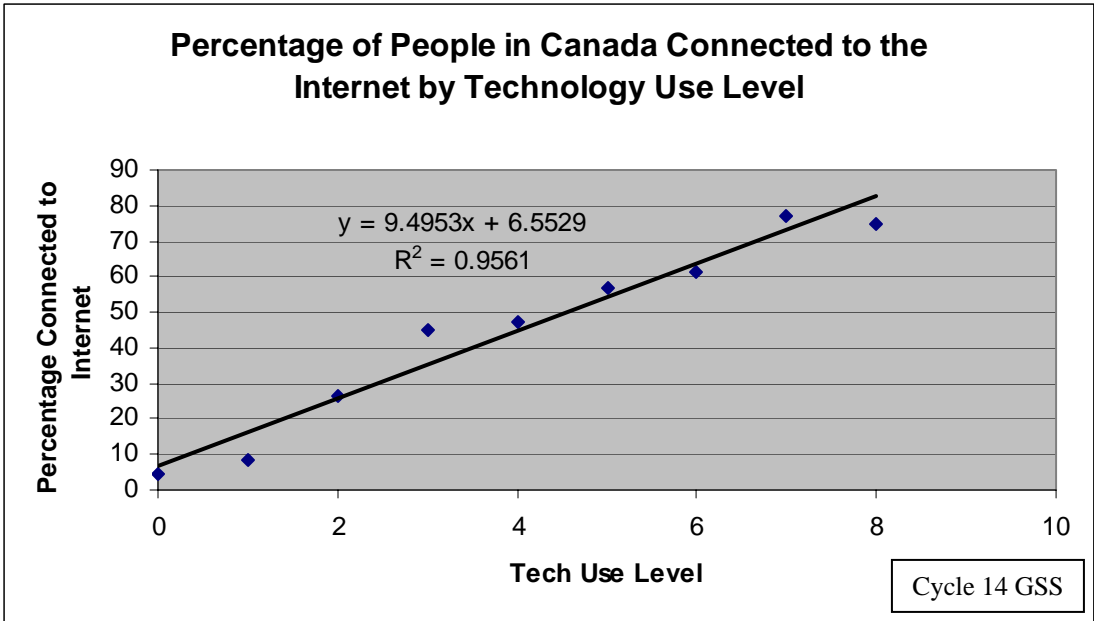
A household with a household head who is between the ages of 35 and 54 is most likely to use the Internet. This is because these households will usually have well established families, and each member can contribute to the use of the Internet. Households with younger household heads are not as likely to already have many family members who can use the Internet. Households with older household heads have usually seen most of their family move out of the house. Also, having grown up in low-tech environments, more elderly household heads may not be as dependent on the use of the Internet.

### Percentage of Households in Canada Regularly Using the Internet Based on Household Head Education (2001)

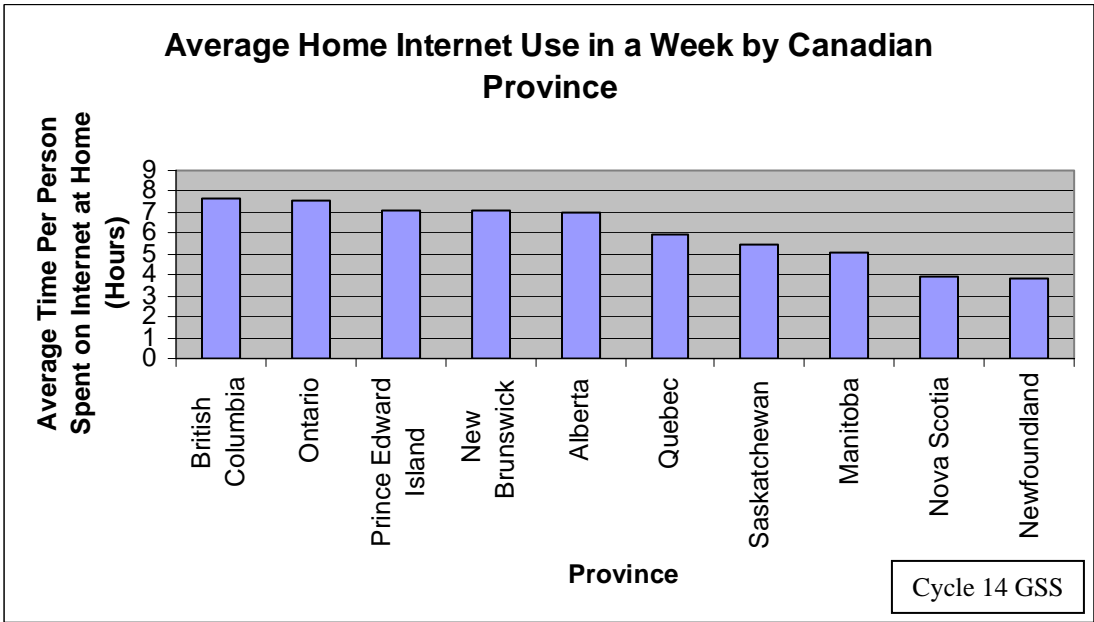


CANSIM 358-0005

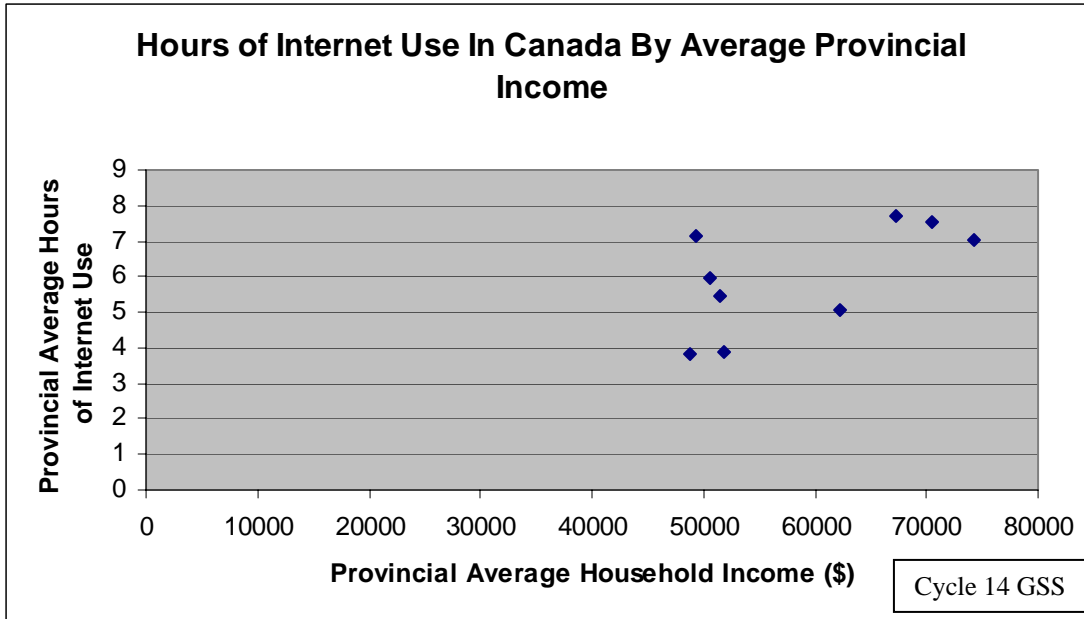
A household with a household head who is well educated is more likely to use the Internet. Well educated people are more likely to see the importance of technology and values of the Internet. Also, people with good educations are more likely to have jobs that provide enough money to spend on a computer and the Internet.



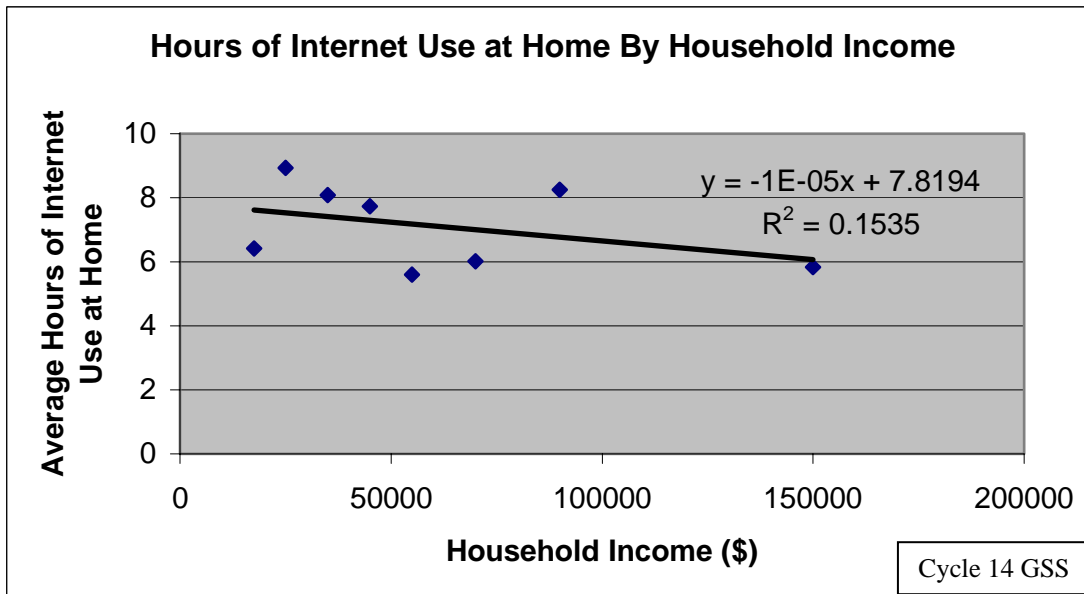
Cycle 14 of the GSS asked each Canadian survey what “Tech Use Level” he or she had. It was basically a rank from 0 to 8. Zero represented the lowest level of technology use while 8 represented the highest. It is clear that people Canadians with higher technology use levels are more likely to be connected to the Internet. The line of best fit representing this trend has an  $R^2$  value (coefficient of determination) of 0.9561, which is close to a value of 1, which a perfect model would achieve.



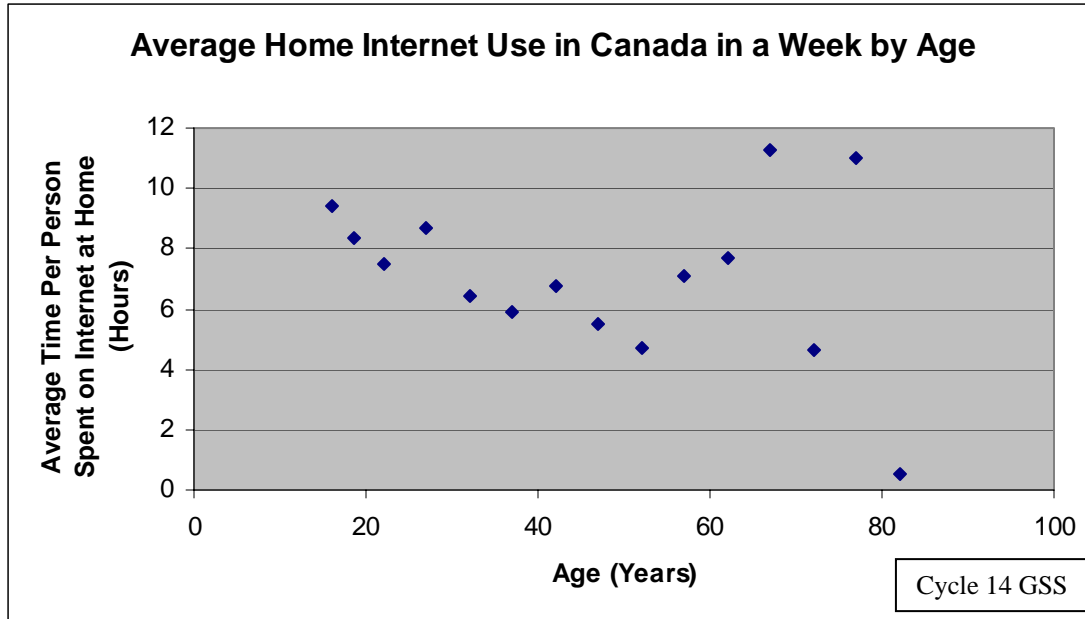
The average number of hours spent on the Internet at home in a week varies depending on province. The factors that allow British Columbia to have such a great value and Newfoundland have such a low value are many. Average income, contrary to what one would think, is not a major factor. This is proved on the next page.



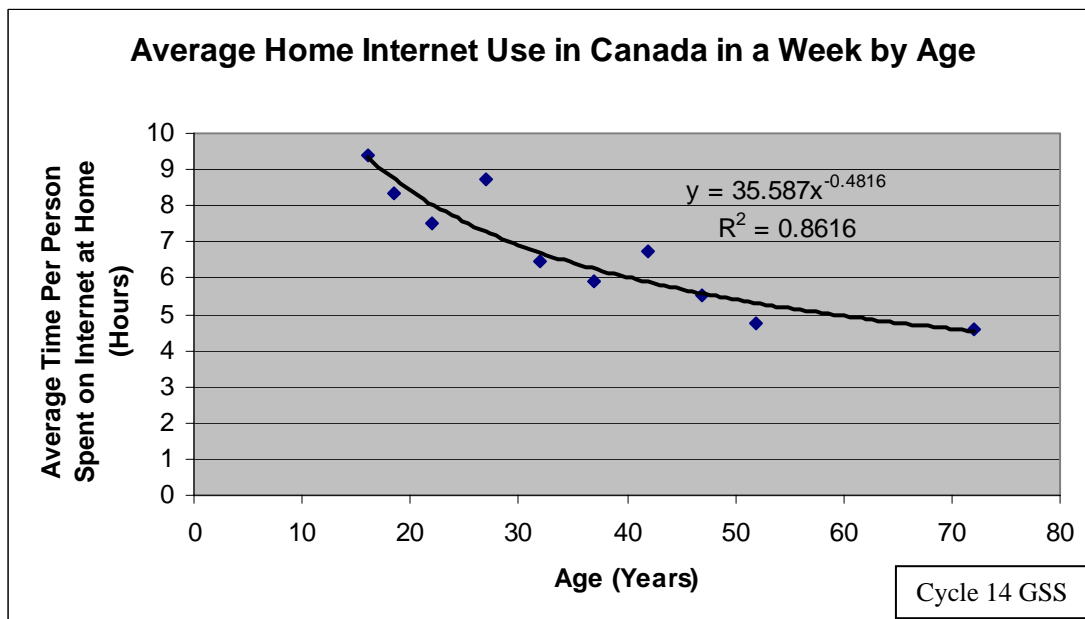
This graph compares the average incomes of each province to their average hours of Internet use per person per week. There is no apparent trend seen through this comparison.



This graph shows the average hours spent on the Internet at home in a week for each household income interval (the interval was reduced to a single value for the graph). Once, again, there is no apparent trend. The linear regression shown decreases for greater household incomes, but it has an extremely small coefficient of determination signifying that the model does not fit the data very well.

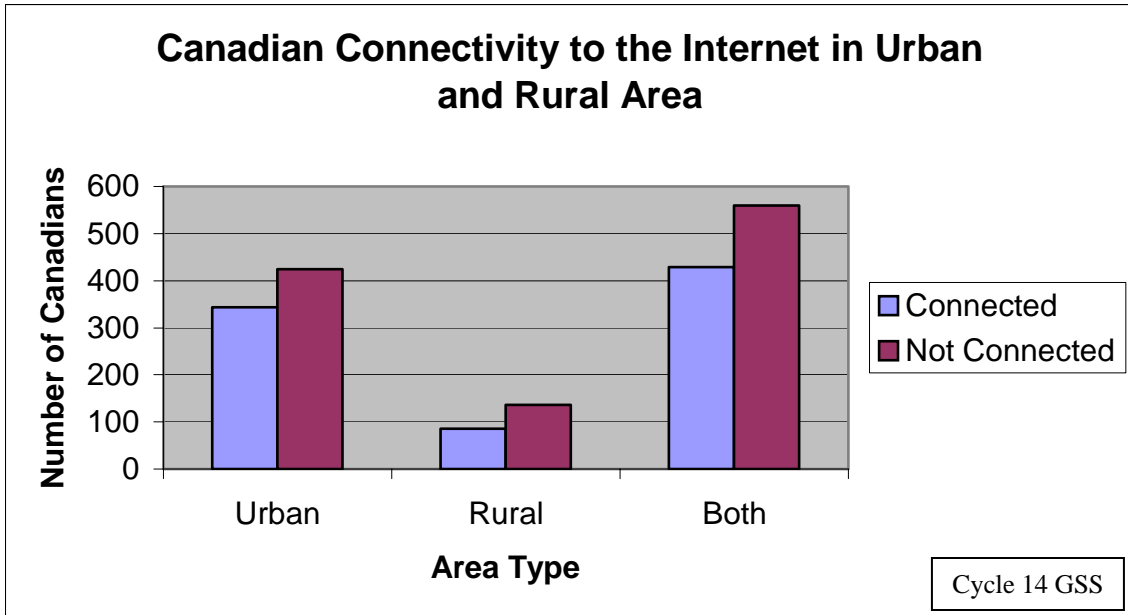


This graph shows the average amount hours spent on the Internet at home by Canadians of different ages. A trend is difficult to see in this graph. This is because some age groups had very few Canadians in them. For example, the “80 years and over” category only contained the time spent on the Internet of one individual, who happened to use the Internet from “1 to 2” hours in a week at home. For the next graph, all of these outliers have been removed. **(Bryan: Please define and describe what you mean by the outliers you removed.)**

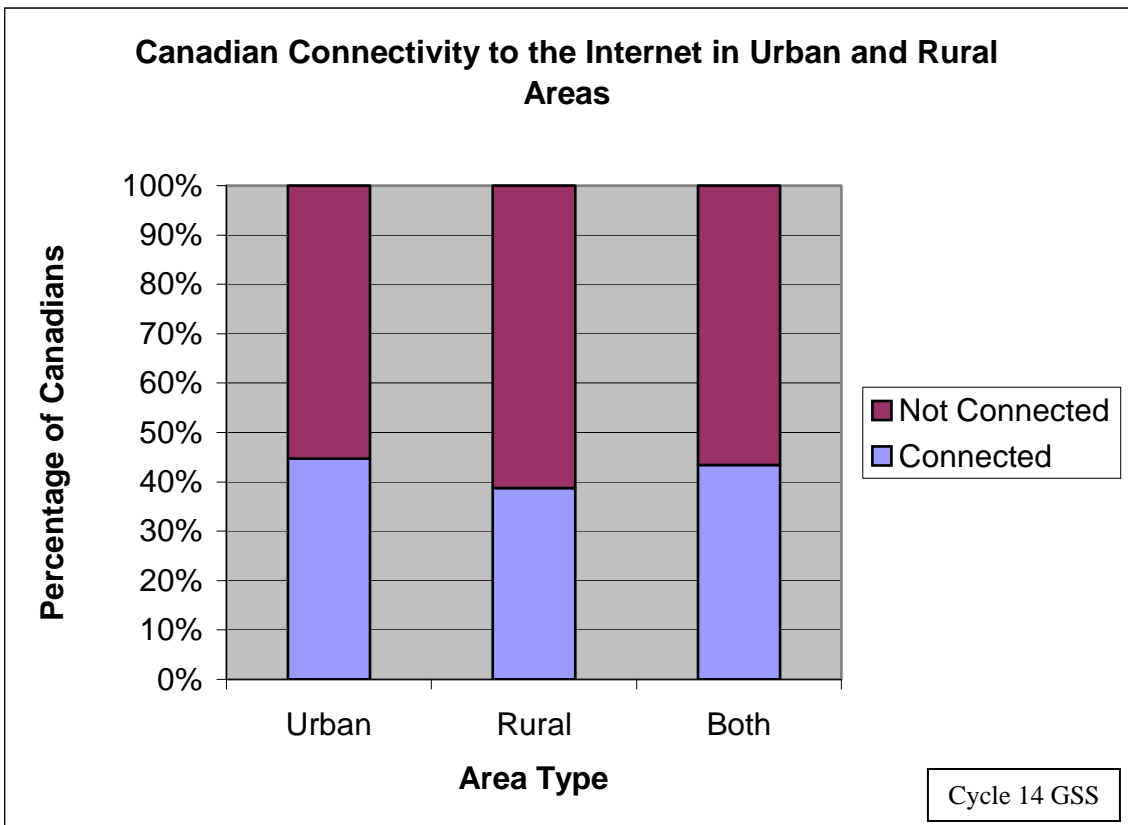


Now it can be seen that the younger an individual is, the more Internet he or she uses. This trend, of course, cannot be extended any further back than about 16 years old. The peak of Internet usage should be at approximately 16 years of age. In either direction, the

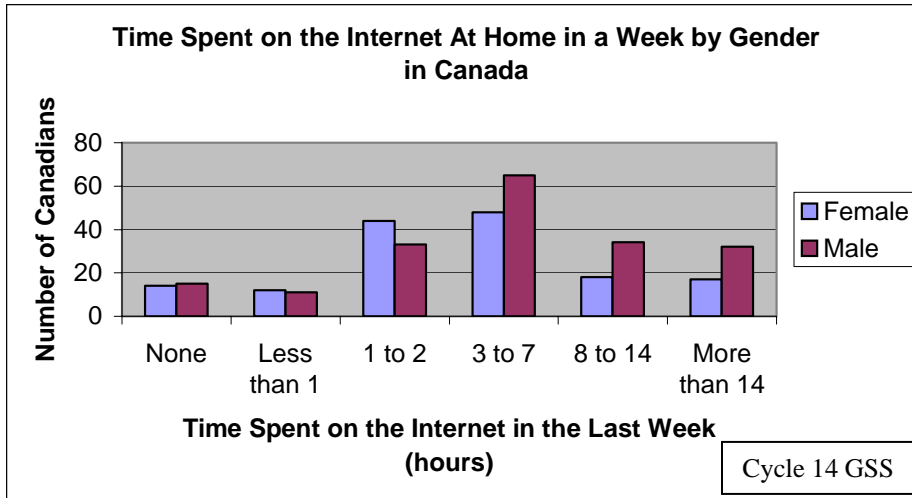
average Internet use decreases. This trend is quite strong with a coefficient of determination of 0.8616.



In any area type in Canada, there are more people not connected to the Internet than there are connected to the Internet. To compare both types of areas:



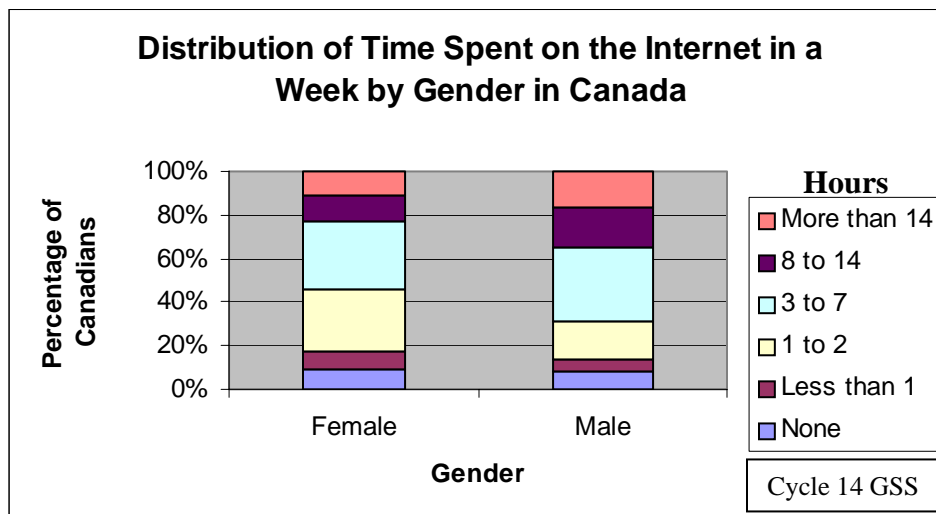
45% of urban Canada is connected to the Internet, while only 39% of rural Canada is connected to the Internet.  
 43% of Canada as a whole is connected to the Internet.



Hours	Female	Male	Female Hours	Male Hours
0	14	15	0	0
0.5	12	11	6	5.5
1.5	44	33	66	49.5
5	48	65	240	325
11	18	34	198	374
22	17	32	374	704
<b>Sum:</b>			884	1458
<b>Average:</b>			5.777777778	7.673684211

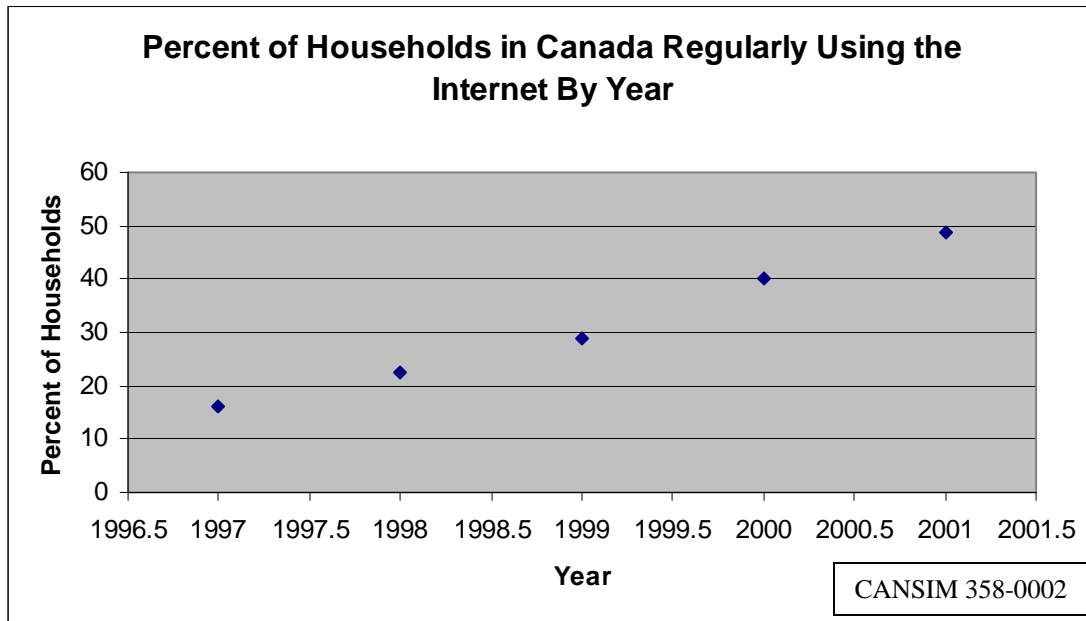
The above graph is not set up as a histogram for the same reasons as previous graphs. Females surpass males in only the “Less than 1” and “1 to 2” categories. The average hours for each gender were calculated in the table to the left. Canadian males spend about 7.7 hours on the

Internet per week, while Canadian females spend about 5.8 hours on the Internet per week. When the genders are broken down by time interval:

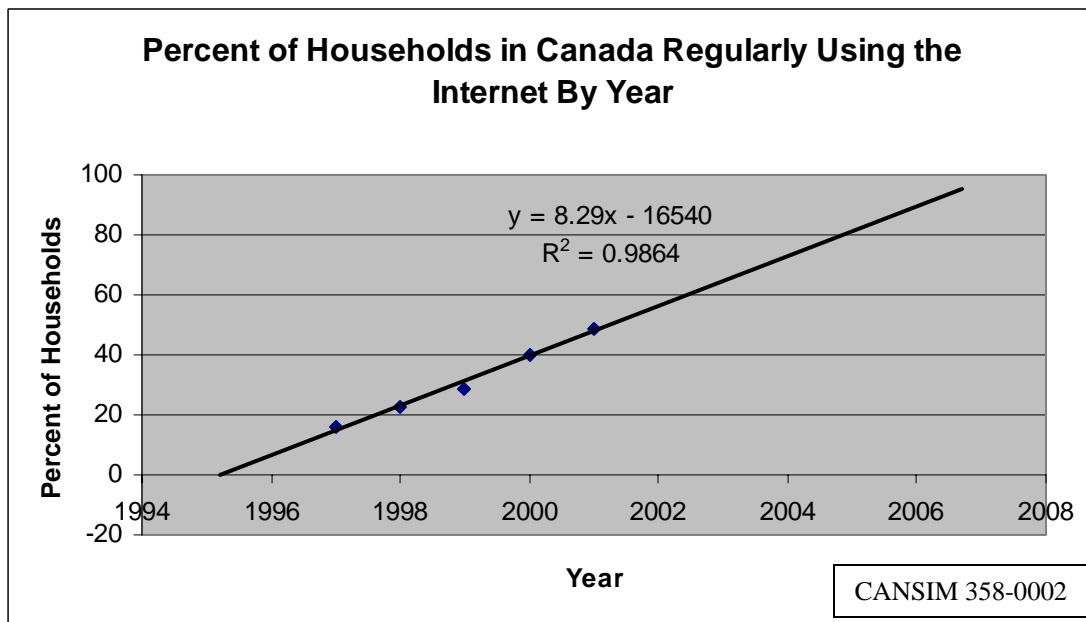


Most males and females use the Internet from “3 to 7” hours every week at home. The next highest interval for females is the “1 to 2” interval. More males, on the other hand, use the Internet between “8 and 14” hours than between “1 and 2” hours. A greater percentage of females did not use the Internet in a week at home.

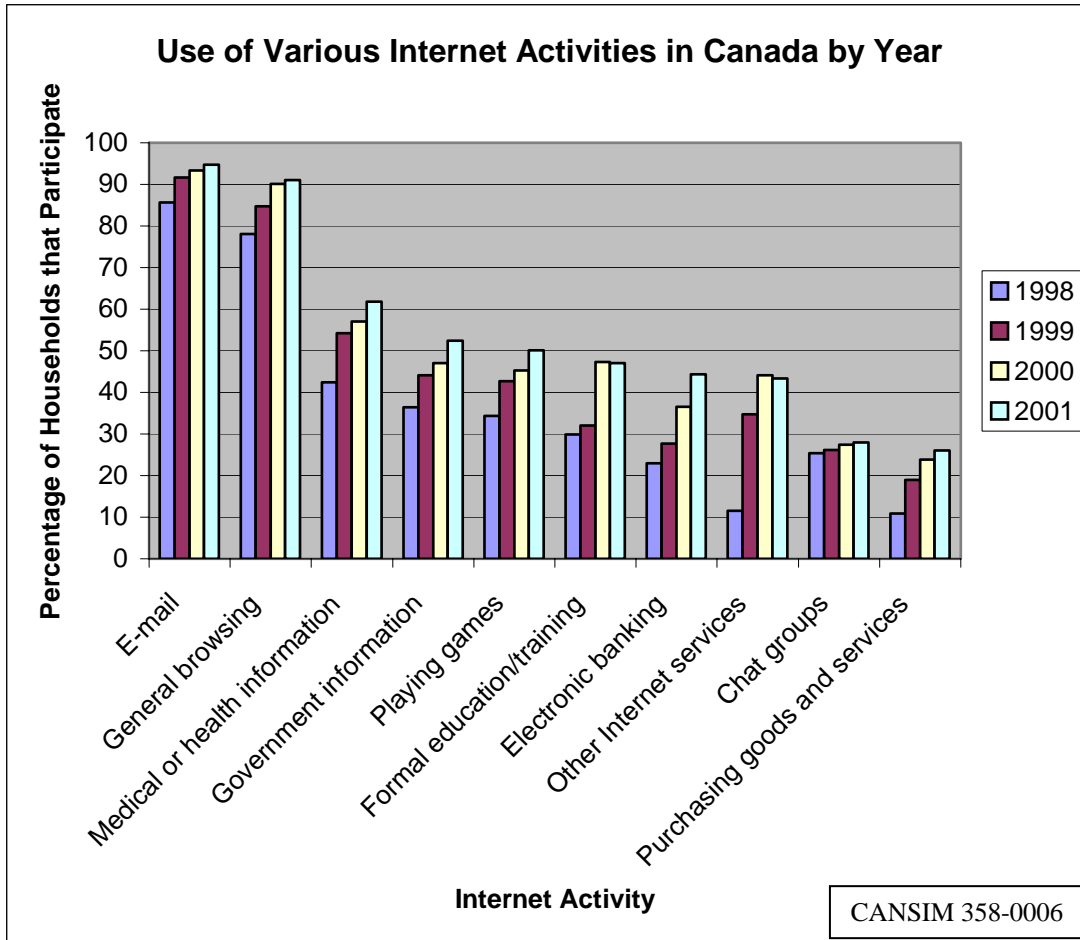
## Use of the Internet over Time



The percentage of households regularly using the Internet has been on a steady rise. This trend can be extrapolated into the future:



Extrapolation does not give a very realistic view of the past (i.e. the Internet was used in 1995 and prior to that); however, it does make an adequate projection into the future. The coefficient of determination is extremely close to 1, indicating a suitable model for the data. It is possible that almost all Canadian households will regularly use the Internet by 2007.



Over the years from 1998 to 2001, the participation in major Internet activities has always increased, with two minor exceptions. From 2000 to 2001, both “Formal education/training” and “Other Internet services” experience very small shifts downwards. The percentage of households that make purchases through the Internet more than doubled throughout the four years. Participation in chat groups has maintained a steady, but extremely slow, increasing pace.

## Conclusion

The Internet influences Canadians on many levels. 43% of Canadians are connected to the Internet and are directly affected by its limitless information, entertainment, and capabilities. The mean time spent on the Internet at home by Canadians is approximately 7 hours. Both the mode and the mean for the same statistic are 5 hours. The Internet also influences the education of Canadians. The mean time spent on the Internet at school by Canadians is approximately 4 hours. The median and mode is 1.5 hours, which is a more realistic estimate.

Some Canadians spend more time on the Internet than others. The use of the Internet by a Canadian is affected by many factors. Depending on where the individual lives, the likelihood that he/she uses the Internet and the time he/she spends on the Internet both change. In Canada, British Columbia has the most Internet use, while Newfoundland is at the other end of the spectrum. Well established families with children use the Internet more often, along with well educated households. Males use the Internet more than females, and rural households use it less than urban households. Also, individuals who are more adept in and influenced by the use of technology are significant users of the Internet. Younger individuals, tracing back to about 16 years old, use the Internet more than older individuals.

The use of the Internet has been increasing in the past, and now, almost all Canadians use e-mail as a form of communication. Regular use of the Internet amongst Canadian households has been on a steady increase from 16% in 1997 to 49% in 2001. The use of the Internet will continue increasing until everyone's every day life is directly affected by this powerful source of knowledge and amusement.

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Folder: MDM Treasure Trove/ Data/Tech use  
Saved: June 10, 2004