



Study of the Characteristics of the Sharers and Non-sharers in the National Population Health Survey



Rebecca Morrison
Health Statistics Methods Section
Household Survey Methods Division

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1.0 Introduction

The National Population Health Survey (NPHS) is a longitudinal survey which collects a variety of health data, from over 17,000 respondents, every 2 years over a period of 18 years. As part of the interview respondents are asked:

“To avoid duplication Statistics Canada intends to share the information from this survey with provincial ministries of health and Health Canada. These organizations have undertaken to keep this information confidential and use it only for statistical purposes. Do you agree to share the information you have provided?”

The purpose of this report is to determine if there are any differences between the NPHS respondents who choose to share their data and those who choose not to share their data. What are the characteristics of the individuals that make up these two groups? Do they differ from one another?

A similar study, entitled *Comparison of the Characteristics of Respondents and Refusals in the NPHS*¹, was conducted on the characteristics of the NPHS respondents and non-respondents. In this study it was found that people who refuse to share their data are more likely to refuse to participate in a subsequent survey cycle.

2.0 Methodology

The cycle 5 full file was used to conduct this study. This means that the data studied came from respondents with fully completed interviews for each of the first 5 cycles of the NPHS. The cycle 5 full file contains data collected from a total of 12,546 respondents. In addition to restricting the study to the cycle 5 full file, only data from living respondents, as of cycle 5, was used to perform the analysis. The reason for this restriction is that records for longitudinal respondents who have died are included in the full file and their data, from the point of their deaths forward, is pre-filled with ‘not stated’ codes. In order to avoid confusing answers that actually were not stated by living respondents with those of the deceased, all deceased respondents were removed from the full file. To be considered as part of the share group, the respondent had to agree to share their data, all other responses, refusing to share, ‘don’t know’ or ‘refusal’ were considered as part of the non-share group. Of the 12,546 records in the full file, 11,284 are from living respondents. Table 2.0-1 presents the frequency distribution of the response to the share question for living respondents in the cycle 5 full file. Only a small proportion, 2.3%, of the study group refused to share their data.

Table 2.0-1 Frequency distribution of the share variable by the population studied

Response to share question	Frequency	Percent
Share	11,028	97.7
Non-share	256	2.3

The study was conducted in two parts: a univariate analysis and a multivariate analysis. For the univariate analysis, weighted frequency distributions of the various variables studied, at the national level, excluding the territories, were compared for the share and non-share groups. An adjusted chi-

¹ Characteristics of Respondents and Refusals in the NPHS, Internal document, Household Survey Methods Division.

squared (χ^2) test, adjusted to take into account the survey design, was performed to determine if the above mentioned variables were significantly related to the share question. For the multivariate analysis, a multiple logistic regression was performed to determine if there is a relationship between many variables and the response to the share question.

The main variables examined for the univariate analysis can be categorized as socio-demographic variables: sex, age group, province of residence, income, immigration status, education, mother tongue, marital status and race; general health variables: presence of a chronic condition, self-perceived general health, insurance for prescription medications and participating in jogging or running over the past three months and; collection variables: actual collection period, language of interview and proxy status. A p-value less than or equal to 0.05 resulting from the χ^2 test indicates dependence between the variable in question and the share question.

Initially, the results of the univariate analysis were used to select variables to be considered for inclusion in the final multiple logistic model; any variable with a p-value less than 0.25 resulting from the adjusted χ^2 test was considered as a potential candidate. This cut-off value forced the exclusion of virtually all of the general health variables examined. The model was then fit with the aid of the logistic regression best subset selection method. This procedure led to the exclusion of all general health variables. After producing a model with a good fit, further investigations were done to access the significance of all variables in the model and to determine whether it is necessary to include any interaction terms in the model. Ultimately, no interactions examined were significant enough to warrant their inclusion in the final model.

Unfortunately, the data studied was inadequate, having too few non-share responses, making it impossible to perform the regression by a selected sub-group, for instance, by age group or province. Examination of the contingency tables of the non-share group divided over the different categories of variables showed many instances of empty cells. Leaving the data as is, with empty cells, can produce a number of undesirable results; it is therefore necessary to either collapse or remove such categories. In this instance, it was decided to remove these categories entirely as the categories removed were either 'not applicable' or 'not stated'.

Again, a p-value less than or equal to 0.05, associated with the odds ratio of the variable in question resulting from the logistic regression, also indicates a relationship between the variable and the share question.

3.0 Highlights

3.1. Univariate Analysis

3.1.1. Socio-demographic Variables:

- sex is not related to the share question
- age group is strongly related to the share question
 - non-share group comprised of more individuals aged 45 and over
- current province of residence is strongly related to the share question
 - more Quebecers and British Columbians and fewer Ontarians among the non-share group
- income is strongly related to the share question
 - non-share group comprised of more income not stated, 28% among the non-share group versus 10% among the share group (weighted)
 - share group comprised of more highest income earners, 32% among share group versus 16% among non-share group
- immigrant status is strongly related to the share question
 - non-share group comprised of more immigrants
- highest level of education is not related to the share question

- having a mother-tongue of English is strongly related to the share question
 - more individuals with mother-tongue other than English among the non-share group
- marital status is related to the share question
 - more widowed and less single people among the non-share group
- race is not related to the share question

3.1.2. General Health Variables:

- having any chronic condition is not related to the share question
- perceived general health is not related to the share question
- having insurance for prescription medications is not related to the share question
- jogging/running in the last three months is strongly related to the share question (but all other physical activities examined are not related)

3.1.3. Collection Variables:

- actual collection period is not related to the share question
- language of interview is related to the share question
 - significantly more interviews conducted in a language other than English among the non-share group
- having the interview conducted by proxy is not related to the share question

3.2. *Multivariate Analysis*

- compared to those aged 20 to 34,
 - those 65 and older are more than three times as likely to refuse to share their data, and
 - those 45 to 64 years old are two and a half times as likely to refuse to share their data
- males are more likely than females to refuse to share their data
- compared to those whose interview was conducted in English, respondents having an interview conducted in a language other than English are nearly four times as likely to refuse to share their data
- income is strongly related to the share question. Compared to middle income families,
 - those not reporting income and those reporting the lowest income range are both close to four times as likely to refuse to share their data
- non-white immigrants are nearly two and a half times more likely to refuse to share their data compared to white non-immigrants
- province of residence is also related to the share question. Compared to Ontarians
 - residents of British Columbia are a little more than three times as likely to refuse to share their data
 - Prairie residents are nearly twice as likely to refuse to share their data

4.0 Observations

4.1. Univariate Analysis

4.1.1. Socio-demographic Variables:

Table 4.1.1-1 Frequency distribution by sex

NPHS Cycle 5						
	Sharers			Non-sharers		
Sex	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Male	4,882	12,546,323	48.9	131	311,529.54	56.5
Female	6,114	13,101,326	51.1	124	239,564.50	43.5
			X^2	DF	p-value	
			3.244	1	0.0717	

There are some differences in the distribution of responses to the share question by sex. Examining table 4.1.1-1, more males than females refuse to share their data; however, the adjusted chi-squared test shows no significance between the response to the share question and the sex of the respondent.

Table 4.1.1-2 Frequency distribution by age group

NPHS Cycle 5						
	Sharers			Non-sharers		
Age group	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Less than 20	557	1,547,509	6.0	10	37,049.96	6.3
20 to 34	1,719	5,256,317	20.4	30	85,667.56	14.6
35 to 44	3,457	8,152,546	31.7	63	128,833.95	21.9
45 to 64	3,151	7,119,074	27.7	85	189,017.98	32.1
65 and over	2,144	3,650,147	14.2	82	147,596.94	25.1
			X^2	DF	p-value	
			20.19	4	0.0005	

From table 4.1.1-2, one can see that the frequency distributions by the age group variable for the share and non-share groups differ. The three age groups, that is, those less than 20 years old, 20 to 34 years old and 35 to 44 years old make up a greater proportion of the share group and those in the remaining two age groups, that is, those 45 to 64 years old and 65 years old and over make up a smaller proportion of the share group. Simply put, more people aged 45 and over refuse to share their data. Most noteworthy is the difference, from 14% in the share group to 25% in the non-share group, of those aged 65 and over. The result of the adjusted χ^2 test shows that this variable is strongly related to the share question.

Table 4.1.1-3 Frequency distribution by current province of residence (PRC2_CUR)

Province	NPHS Cycle 5					
	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Newfoundland and Labrador	646	468,566	1.8	13	7,936.09	1.4
Prince Edward Island	643	118,674	0.5	16	2,772.20	0.5
Nova Scotia	682	825,079	3.2	8	10,899.05	1.9
New Brunswick	737	692,692	2.7	14	11,638.67	2.0
Quebec	1,951	6,347,467	24.7	57	176,117.89	30.0
Ontario	2,684	9,690,461	37.8	42	123,106.26	21.0
Manitoba	763	945,921	3.7	27	27,176.36	4.6
Saskatchewan	739	828,226	3.2	22	20,418.11	3.5
Alberta	1,131	2,614,119	10.2	26	51,970.48	8.9
British Columbia	1,020	3,116,443	12.2	44	154,255.55	26.3

X^2 DF p -value
49.49 **9** **< 0.0001**

Examining the distribution of responses to the share question by province of residence presented in table 4.1.1-3 shows more Quebecers and British Columbians and fewer Ontarians among the non-share group. Most noteworthy is the proportion of British Columbians among the non-share group, 26%, compared to the share group, 12%.

Two household income variables, income adequacy (INC2DIA5) and total household income from all sources (INC2DHH), were used to evaluate whether an individual’s household income status had an impact on their likelihood to share their data. Both variables gave similar results. Table 4.1.1-4 presents the results for the income adequacy variable.

Table 4.1.1-4 Frequency distribution by income adequacy (INC2DIA5)

Income group	NPHS Cycle 5					
	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Lowest	274	553,760	2.2	15	35,486.81	6.0
Low to middle	865	1,620,470	6.3	23	39,195.91	6.7
Middle	2,278	4,639,152	18.0	38	83,810.60	14.2
Upper to middle	3,543	8,300,170	32.3	72	167,339.53	28.5
Highest	2,963	8,144,143	31.7	46	96,634.84	16.4
Not stated	1,105	2,467,897	9.6	76	165,698.70	28.2

X^2 DF p -value
35.71 **5** **< 0.0001**

There is a much higher proportion of income not stated among the non-share group, 28%, compared to the share group, 10%. Conversely, there are fewer highest income earners among the non-share group. The share group is comprised of 32% highest income compared to only 16% among the non-share group. The adjusted χ^2 test shows that income is strongly related to the share question.

Table 4.1.1-5 Frequency distribution by immigration status (IMM)

NPHS Cycle 5						
Immigration status	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Yes	1,139	4,032,497	15.7	47	148,500.10	25.2
No	9,885	21,678,282	84.3	223	439,666.29	74.8
χ^2 <i>DF</i> <i>p-value</i> 4.124 1 0.0423						

Looking at the frequency distribution by immigration status presented in table 4.1.1-5, it can be seen that there is a greater proportion of immigrants in the non-share group, 25%, compared to the share group, 16%. The χ^2 test shows dependence between the immigration status and the share question.

Examining the frequency distribution by the highest level of education variable presented in table 4.1.1-6, we see that there is a similar distribution among the education categories for the share and non-share groups. The adjusted χ^2 test shows that the highest level of education attained is not related to the share question. In fact, the same can be said for the other education variables examined, graduated from high school (EDC2_5) and attended a post-secondary institution (EDC2_6) (both not shown) exhibit no evidence of dependence with the share question.

Table 4.1.1-6 Frequency distribution by highest level of education (EDC2D3)

NPHS Cycle 5						
Level of education	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Less than high school	2,880	6,234,310	24.3	78	153,012.11	26.3
High school	1,292	3,111,823	12.1	36	78,539.11	13.5
Some post-secondary	2,597	6,093,231	23.7	56	118,823.94	20.4
Post-secondary	3,557	8,543,707	33.2	87	194,901.39	33.5
Not applicable	696	1,716,629	6.7	10	37,049.96	6.4
χ^2 <i>DF</i> <i>p-value</i> 0.7877 4 0.9401						

The frequency distribution by English mother tongue variable, SDC2_6A, is presented in table 4.1.1-7. There are more individuals with a mother tongue other than English among the non-share group. Based on the adjusted χ^2 test, having a mother tongue of English is strongly related to the response of the share question. Another language variable, the ability to converse in English, SDC2_5A (not shown), also gave similar results.

Table 4.1.1-7 Frequency distribution by English as mother tongue (SDC2_6A)

NPHS Cycle 5						
English as mother tongue	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Yes	7,635	15,622,692	61.2	160	280,169.04	48.1
No	3,249	9,901,369	38.8	107	302,157.47	51.9
			X^2	DF	p-value	
			8.716	1	0.0032	

The frequency distribution by the marital status variable is presented in table 4.1.1-8. There are more widowed and less single respondents among the non-share group. The χ^2 test shows dependence between the marital status and the share question.

Table 4.1.1-8 Frequency distribution by marital status (DHC2_MAR)

NPHS Cycle 5						
Marital status	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Married	4,949	11,495,666	44.7	118	267,376.19	45.5
Common-law	761	1,736,234	6.7	14	33,244.00	5.7
Widowed	953	1,380,759	5.4	38	62,192.43	10.6
Separated	350	800,868	3.1	9	12,299.60	2.1
Divorced	693	1,269,810	4.9	18	33,526.83	5.7
Single	3,321	9,040,009	35.1	73	179,527.34	30.5
			X^2	DF	p-value	
			11.49	5	0.0424	

The frequency distribution by the race variable is presented in table 4.1.1-9. There are fewer white respondents among the non-share group. The proportion of Asians among the non-share group is nearly twice that of the share group, 13.3% in the non-share group compared to 6.7% among the share groups. However, the adjusted χ^2 test shows that race is not related to the share question.

Table 4.1.1-9 Frequency distribution by the race variable

NPHS Cycle 5						
Sharers			Non-sharers			
Race	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
White	10,389	23,048,779	91.1	230	458,498.79	83.2
Black	93	415,576	1.6	4	12,566.29	2.3
Asian	326	1,692,225	6.7	16	73,353.52	13.3
Aboriginal	80	144,042	0.6	5	6,675.44	1.2
			X^2	DF	p-value	
			5.9	3	0.1166	

4.1.2. General Health Variables:

Table 4.1.2-1 Frequency distribution by any chronic conditions (CCC2DANY)

NPHS Cycle 5						
Sharers			Non-sharers			
Chronic condition	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Yes	7,406	16,744,116	65.8	183	397,825.36	68.5
No	3,464	8,714,193	34.2	84	183,075.39	31.5
			X^2	DF	p-value	
			0.9332	1	0.334	

Having any chronic condition, CCC2DANY, is not related to the share question. The frequency distribution presented in table 4.1.2-1 is very similar for the share and non-share groups. In fact, all chronic conditions examined are not related to the response of the share question.

Table 4.1.2-2 Frequency distribution by self-perceived general health (GHC2_1)

General health	NPHS Cycle 5					
	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Excellent	2,222	5,693,052	22.1	42	107,751.13	18.3
Very good	4,250	9,816,793	38.2	87	199,166.28	33.9
Good	3,202	7,514,342	29.2	99	196,659.16	33.5
Fair	1,052	2,100,113	8.2	30	64,175.64	10.9
Poor	296	592,119	2.3	11	19,888.34	3.4
		X^2 5.063	DF 4	p -value 0.2809		

As shown in table 4.1.2-2, the distribution of the self-perceived general health variable among the non-share group is greater for the poor to good categories compared to the share group. Consequently, there are fewer very good and excellent responses among the non-share group; however, the adjusted χ^2 test shows no dependence between the self-perceived general health and the share question.

Table 4.1.2-3 Frequency distribution by insurance for prescription medications (ISC2_1)

Medical insurance	NPHS Cycle 5					
	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Yes	8,437	20,470,379	81.2	184	431,977.65	75.9
No	2,336	4,732,868	18.8	77	136,906.39	24.1
		X^2 2.967	DF 1	p -value 0.085		

As shown in table 4.1.2-3, the non-share group is made up of more individuals without insurance for prescription medications (ISC2_1). The adjusted χ^2 test indicates no association between the two variables.

Table 4.1.2-4 Frequency distribution by jogging or running in the past three months (PAC2_1J)

Physical activity	NPHS Cycle 5					
	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Yes	1,559	4,572,861	18.4	17	41,181.46	7.4
No	8,418	18,578,856	74.7	227	477,197.55	85.9
Not applicable	696	1,716,629	6.9	10	37,049.96	6.7
		X^2 10.77	DF 2	p -value 0.0046		

As shown in table 4.1.2-4, the non-share group is comprised of fewer individuals that participated in jogging or running activities in the last three months. In fact, the adjusted χ^2 test shows strong dependence between this activity and the share question. Interestingly enough, the other physical activity variables examined, walking, participating in daily physical activity and participating in leisure activities (all not shown) give the opposite result.

4.1.3. Collection Variables:

Table 4.1.3-1 Frequency distribution by actual collection period (SP32_CPA)

Collection period	NPHS Cycle 5							
	Sharers			Non-sharers				
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)		
Quarter 1	2,224	4,559,527	17.8	53	97,370.19	16.6		
Quarter 2	2,354	4,755,078	18.6	62	123,260.78	21.0		
Quarter 3	3,131	7,812,636	30.6	73	177,065.94	30.1		
Quarter 4	2,933	7,782,148	30.5	68	149,951.01	25.5		
Quarter 5	247	647,083	2.5	14	40,518.47	6.9		
χ^2			DF			p-value		
6.905			4			0.141		

Presented in table 4.1.3-1 is the frequency distribution by the actual collection period for the share and non-share groups. Although, there is a greater proportion of respondents in quarter 5 among the non-share group, the adjusted χ^2 test clearly shows no relationship between the collection period and the response of the share question.

Table 4.1.3-2 Frequency distribution by language of interview (H06LANG2)

Language of interview	NPHS Cycle 5							
	Sharers			Non-sharers				
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)		
English	8,921	19,468,725	75.7	203	384,850.63	65.4		
French	2,086	6,178,343	24.0	60	178,292.27	30.3		
Other	21	78,524	0.3	7	25,023.49	4.3		
χ^2			DF			p-value		
8.373			2			0.0152		

The frequency distribution by the language of interview variable is presented in table 4.1.3-2. There are fewer interviews conducted in English and more interviews conducted in French among the non-share group. The adjusted χ^2 test indicates dependence between the share question and the language of the interview.

Table 4.1.3-3 Frequency distribution by proxy status (AM62_PXY)

Proxy response	NPHS Cycle 5					
	Sharers			Non-sharers		
	Number of respondents	Number of respondents (weighted)	% (weighted)	Number of respondents	Number of respondents (weighted)	% (weighted)
Yes	988	2,481,439	9.7	22	62,361.75	11.3
No	10,008	23,166,210	90.3	233	488,732.29	88.7
			χ^2	DF	p-value	
			0.23528	1	0.62764	

Having an interview conducted by proxy does not impact on whether the respondent agrees or disagrees to share their data. The proportion of proxy and non-proxy interviews is relatively close for both the share and non-share group and the adjusted χ^2 test shows no relationship between the two variables.

4.2. Multivariate Analysis

The resulting odds ratios from the logistic regression are presented in table 4.2-1. According to these results, the sex of the respondent does affect their willingness to share their data. Females are more likely than males to agree to share their data. In addition, the age of the respondent is related to the response of the share question. As observed in the univariate findings, those aged 45 and older are less willing to share their data. In fact, those aged 65 and older are about three times more likely to respond negatively to the share question compared to those aged 20 to 34.

The language of the interview is also related to the share question. Respondents having their interview conducted in a language other than English are almost four times more likely to refuse to share their data than those whose interview was conducted in English.

As has been shown in previous studies, those who do not report their income are more likely to refuse to share their data. In fact, compared to middle income earners, not reporting income increases the odds of refusing to share by nearly three times. This result agrees with the univariate findings that indicate that income is strongly related to the share question. Additionally, those reporting income in the lowest category are nearly four times as likely to refuse to share their data as are middle income earners.

For the multiple logistic regression, immigration status and race were combined into one variable. Compared to white non-immigrants, non-white immigrants are close to two and a half times more likely to refuse to share their data. The other categories, white immigrant and non-white non-immigrant were not significantly associated with the share question.

A region variable was derived based on province of residence, the categories include, the Atlantic Provinces, Quebec, Ontario, the Prairies and British Columbia. Similar to the univariate findings, British Columbians are more than three times as likely as Ontarians to refuse to share their data. In addition, Prairie residents are nearly twice as likely as Ontarians to refuse to share their data.

Table 4.2-1 Odds ratios for the non-share group

Variable and category	Odds ratio	95% Confidence interval
Age group:		
19 and under	1.27	(0.59 - 2.73)
20 to 34	1 ^ψ	N/A
35 to 44	1.92*	(1.00 - 3.67)
45 to 64	2.54**	(1.47 - 4.39)
65 and over	3.23**	(1.79 - 5.81)
Sex:		
Male	1.54*	(1.09 - 2.18)
Female	1 ^ψ	N/A
Language of interview:		
English	1 ^ψ	N/A
Other	3.79**	(1.94 - 7.42)
Income adequacy:		
Lowest	3.89**	(1.54 - 9.85)
Low to middle	1.25	(0.54 - 2.92)
Middle	1 ^ψ	N/A
Upper to middle	1.20	(0.65 - 2.22)
Highest	0.77	(0.40 - 1.48)
Not stated	3.70**	(2.03 - 6.76)
Race/Immigration status:		
White, non immigrant	1 ^ψ	N/A
Non-white, non immigrant	1.28	(0.49 - 3.31)
White, immigrant	1.28	(0.70 - 2.31)
Non-white, immigrant	2.35*	(1.19 - 4.61)
Region:		
Atlantic	1.07	(0.58 - 1.99)
Quebec	0.67	(0.33 - 1.36)
Ontario	1 ^ψ	N/A
Prairies	1.70*	(1.04 - 2.76)
British Columbia	3.19**	(1.86 - 5.47)

^ψ Reference category

* Significantly different from reference category (p < 0.05)

** Significantly different from reference category (p < 0.01)

5.0 Concluding Remarks

The purpose of this paper was to determine if there are particular characteristics about the National Population Health Survey's respondents that influence whether or not they agree or disagree to share their data. Reassuringly, both the univariate and multivariate analyses did not indicate any relationship between an individual's health characteristics and the response to the share question. In fact, both analyses support the notion that a respondent's age, household income, race and immigration status and region of residence are the most influential characteristics associated with the share question.