



COMMISSIONED REPORT

Commissioned Report No. 296

Scottish Recreation Survey:

Calibration Exercise 2006 - 2007

(ROAME No. R06AA620)

For further information on this report please contact:

Fiona Cuninghame
Scottish Natural Heritage
Great Glen House
Leachkin Road
INVERNESS
IV3 8NW
Telephone: 01463 725000
E-mail:
Fiona.Cuninghame@snh.gov.uk

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Summary

Scottish Recreation Survey: Calibration Exercise 2006 - 2007

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Background

Scottish Natural Heritage (SNH) measures the levels of participation in walking, and other open-air recreational activities, each year to support the achievement of Scottish Government policy. A set of questions forming the Scottish Recreation Survey has been inserted into the Scottish Opinion Survey – a monthly Computer Aided Personal Interview (CAPI) omnibus – since July 2003. In September 2005 the questionnaire was amended with changes made to the wording of questions regarding the incidence and frequency of visits taken during the 12 months and 4 weeks prior to interview and also to the question order. This appeared to result in an increase in the number of people stating that they had participated in outdoor recreation in Scotland. To examine this and to determine the degree of change in responses associated with the questionnaire change a calibration exercise was undertaken during the typically high participation months of June and July 2006 and lower participation months of January and February 2007.

Main findings

In the calibration exercise, most recorded results were higher with the new questions, suggesting that the questions used since September 2005 were likely to record higher levels of participation. However, an analysis of the statistical significance and the degrees of influence of each of the four waves of surveying suggested that there was insufficient evidence to draw any firm conclusions from this exercise.

Conclusions

This exercise was not able to confirm the effect of changing the questions or to quantify the scale of the impact of the question change. Therefore, to ensure statistical rigour of the survey, it is proposed that results relating to levels of participation in outdoor recreation, as well as estimates of the total volume and value of visits to the outdoors for periods prior to September 2005, should not be considered comparable with data collected more recently.

For further information on this project contact.

**Fiona Cuninghame, Great Glen House, Leachkin Road, Inverness IV3 8NW
Tel: 01463-725 000**

For further information on the SNH Research & Technical Support Programme contact:

Policy & Advice Directorate Support, Scottish Natural Heritage, Great Glen House, Inverness, IV3 8NW.

Tel: 01463-725 000 or ascg@snh.gov.uk

Contents

Summary

1	BACKGROUND	1
1.1	Introduction	1
1.2	Questionnaire change	2
1.3	Calibration exercise.....	3
1.4	Statistical Methodology	3
2	SUMMARY OF MAIN FINDINGS.....	5
2.1	Results regarding percentage of respondents participating in the last 12 months....	5
2.2	Results regarding percentage of respondents participating in the last 4 weeks	6
2.3	Results regarding number of visits taken in the last 4 weeks	7
2.4	Variations in impact of the questionnaire change across the population	7
3	IMPLICATIONS OF FINDINGS	9
	Appendix 1 Changes to questions.....	11
	Appendix 2 Outdoor recreation visits in 2004 and 2005.....	13

List of Tables

Table 1:	Percentage of respondents taking outdoor recreation visits in the last twelve months	5
Table 2:	Percentage of respondents taking outdoor recreation visits in the last 4 weeks.....	6
Table 3:	Mean number of visits in the last four weeks (including non-participants)	7

1 BACKGROUND

1.1 Introduction

The overall aim of the Scottish Recreation Study (ScRS) is to provide continuous monitoring of participation in outdoor recreation in Scotland. The specific objectives are as follows:

- To measure and collect details about the Scottish adult (16 years and over) population's participation in outdoor recreation;
- To provide a picture of the types of location that recreational users visit – including countryside, inland water and coastal locations as well as urban sites, e.g. woodlands in towns and cities;
- To report on other issues, such as social and economic links with recreational use of the outdoors, e.g. expenditure, transport, party composition and social classification of users;
- To act as one of the monitors of levels of awareness of the Scottish Outdoor Access Code, including levels of responsible behaviour.

Fieldwork has been undertaken every month since July 2003. In September 2005, TNS Travel & Tourism were commissioned to continue surveying until 2013. The study continues to be undertaken through the monthly inclusion of questions in the Scottish Opinion Survey, an omnibus survey involving around 1,000 interviews per month. Interviews are conducted in-home using CAPI (Computer Assisted Personal Interviewing) hardware, with a representative sample of Scotland's adult (16 years and over) population. Every month, interviews are undertaken in 42 sampling points throughout the country with quota targets set on the basis of gender, age-group, social grade and working status. Within each stratification respondents are selected on a random basis.

Only one interview may be conducted per household and a random route procedure is adopted within each sampling point, requiring a minimum of five households being left between each successful interview. This procedure helps ensure that interviewing in each sample point is not restricted to a small geographical area only containing individuals with similar demographic and lifestyle characteristics, thereby minimising the effects of clustering within the sample. A spread of timing of interviews facilitates the completion of sample quotas with interviewers contacting respondents during both weekdays and weekends at different times of day.

At the analysis stage, the survey data is weighted to ensure that the sample profile matches that of the Scottish adult population.

1.2 Questionnaire change

A new contract commenced in September 2005 and included some changes to the wording of the initial questions. These identified whether respondents had undertaken any outdoor recreation visits during the previous 12 months and their frequency of participation in the previous 4 weeks (see Appendix 1). The main reasons for these changes were to manage the length of the questionnaire and to seek cost efficiencies.

Also, from September 2005, the ScRS questions were consistently placed as the first series of questions in the monthly omnibus survey. Prior to that date, the ScRS positioning in the questionnaire varied and, in certain months, followed questions on other subjects. The overall omnibus survey length is restricted to a maximum of 25 minutes to minimise respondent fatigue.

With the analysis of the full year results for 2005, it became apparent that there had been an increase in the proportion of respondents reporting that they had participated in outdoor recreation in the previous 12 months. Furthermore the proportions reporting having taken visits in the 4 weeks prior to interview and mean number of visits reported had also increased (see Appendix 2). These changes may have been due to a number of factors including a real increase in participation in outdoor recreation amongst the Scottish population and the effects of campaigns promoting exercise. However, there was a considerably greater average increase for the months after the questionnaire change (September to December), than January to August, suggesting that the questionnaire revisions may have influenced responses.

It was hypothesised that when using the original series of questions (pre September 2005) some low frequency outdoor recreation participants may have 'opted out' of the survey at an early stage by providing a response of 'No' at Q1 which asked whether respondents had taken any trips to the outdoors in the last 12 months. However, with the revised questionnaire structure, these types of respondents were more likely to indicate that they took part in outdoor recreation infrequently rather than selecting the 'Never' option. The impact of such a change in respondents' answering behaviour would be an increase in the proportion of respondents claiming to have taken part in any outdoor recreation visits in the previous 12 months' period. Therefore, there would also be an increase in the proportion of

individuals asked the subsequent questions regarding participation in outdoor recreation during the preceding 4 weeks.

1.3 Calibration exercise

It was apparent that the questionnaire changes described previously may have resulted in an increase in the proportion of respondents reporting having taken visits to the outdoors for recreation during the preceding 12 months and 4 weeks. However, the exact scale of this change was not immediately evident.

TNS were therefore commissioned by SNH to undertake a calibration exercise during the typically high participation months of June and July 2006 and lower participation months of January and February 2007. During each of these four months, half of the survey sample was interviewed using the original questionnaire design (i.e. that in use pre September 2005) while the other half was interviewed using the new design (see Appendix 1). The sampling procedure was established to ensure that the demographic and geographic profile of the samples interviewed using both sets of questions were as similar as possible and interviewing was undertaken during identical time periods.

It is important to note that the question changes were tested in this calibration work and not the positioning of the ScRS questions which also had the potential to influence respondents' answers. Interview fatigue is considered more likely to have an effect the further on into the survey the ScRS questions were asked, with people answering 'no', that they had not participated in any recreational trips, to try to finish the survey more quickly. During this calibration exercise, both the new and original questions were placed at the start of the omnibus survey. As such, no assessment of the positioning of the questions can be made.

Over the four months of the exercise some 4,103 interviews were completed - 2,018 using the original questionnaire design and 2,085 using the new design.

1.4 Statistical Methodology

The difference between the original and new questionnaires was tested using two different statistical methods, each with their advantages and disadvantages.

1) For each month, the difference between each month was tested to see if it was significantly different from zero (i.e. no difference) by using the two sample *t*-test. This is a standard procedure which uses all the data. However, as there are four separate tests (one

for each month) this increases the risk of a false positive, i.e. a significant difference is detected when there actually is none. As the data is in the form of yes/no or ordered categories, it is not possible to combine all the data into one test that uses all the data without losing the pair wise nature of the data (i.e. the two data for each month). The standard 95% confidence level is used to state whether the difference is significantly different from zero (i.e. no difference). This method is referred to as the two sample *t*-test and the results are reported in the relevant tables.

2) The second method finds the difference between the original and new questionnaires for each month. Using the one sample *t*-test, the mean of these differences is tested for a statistical difference from zero (i.e. no difference). Whilst lowering the risk of false positive results, it does not use all the data. Only the summary data is used and so the number of people participating in each questionnaire for each month is ignored. Again, the 95% confidence level is used to state whether the difference is significantly different from zero. This is referred to as the one sample *t*-test. This result is reported below each table in section 2 and not within the table. This is because only one test has been performed for all four months together and so the results do not relate to each month individually, but rather all months as a combination. They are not included on the average line of the tables as this one sample *t*-test uses the four differences between the months and not the one difference between the overall means for the original and new questionnaires.

Both these methods are to be used in conjunction. Any discrepancies are discussed.

2 SUMMARY OF MAIN FINDINGS

Following the completion of fieldwork, a detailed comparison of the results obtained using the original and new questions was undertaken. The key results obtained from this analysis are outlined in the following sections.

2.1 Results regarding percentage of respondents participating in the last 12 months

Table 1 illustrates the percentages of respondents that reported taking at least one outdoor recreation visit during the 12 months prior to interview, as recorded using the original and new questionnaires in each of the four months of survey fieldwork.

In all four waves of surveying a higher percentage of respondents interviewed using the new questions reported having taken any outdoor visits in the previous 12 months compared to those asked the original questions. While consistent results were obtained in June, July and February, the percentage of respondents reporting participation, with both the original and new questions, was lower in January.

Table 1 Percentage of respondents taking outdoor recreation visits in the last twelve months

	Result with original questions (%)	Result with new questions (%)	Difference (%)	Significant difference using two sample <i>t</i> -test?*
June 2006	75	81	+6	y
July 2006	75	81	+6	y
January 2007	66	76	+10	y
February 2007	74	80	+6	y
Average (mean)	73	80	+7	y

* The one sample *t*-test also shows that there is a significant difference between the original and new questionnaires.

Although both statistical methods show that there is a significant difference between the original and new questionnaires, they do not provide a reliable method to say what that difference is. This is because the January 2007 results are markedly different from the other months and there are only four months of data. With so few months, it is not possible to say whether the result from January 2007 is extreme or part of the real underlying distribution of annual results.

2.2 Results regarding percentage of respondents participating in the last 4 weeks

As Table 2 illustrates, when respondents were asked if they had taken any outdoor recreation visits during the 4 weeks prior to interview, the results obtained using the new questions were consistently higher than those obtained using the original questions, a similar pattern to that seen in the results relating to participation in the previous 12 months (Table 1), although the differences are not so large.

Table 2 Percentage of respondents taking outdoor recreation visits in the last 4 weeks

	Result with original questions (%)	Result with new questions (%)	Difference (%)	Significant difference using two sample <i>t</i> -test?*
June 2006	57	62	+5	n
July 2006	64	66	+2	n
January 2007	44	47	+3	n
February 2007	52	56	+4	n
Average (mean)	54	57	+3	n

* Unlike the two sample *t*-test, the one sample *t*-test shows that for this question, there is a significant difference between the original and new questionnaires.

All of the results from the two sample *t*-test show that there is not enough evidence to say that there is a significant difference, whereas the results from the one sample *t*-test suggest that there is. As mentioned in section 1.4, the disadvantage of this multiple two sample *t*-test is the increased risk of one of the tests giving the wrong result. However, as all the results here give the same answer, this test now has more weight than the one sample *t*-test, as the one sample *t*-test only uses summarised data. Hence, the discussion and conclusion discussed below is based on the two sample *t*-test.

Section 2.1 shows that more people would continue with the survey and answer this question in the new questionnaire compared to the old. It is expected that only a small proportion of those would have participated in the last four 4 weeks. This means that any difference between the two questionnaires would be smaller for this question when compared to the question regarding participation in the last twelve months. Also, as the number of respondents for this question is smaller, the variance (a statistical term to describe the spread of the data) would be larger. Both of these points makes detecting a difference between the questionnaires harder. So although there could well be a difference between the questionnaires for this question, the conclusion must be that there is not enough evidence to prove that.

2.3 Results regarding number of visits taken in the last 4 weeks

The third question area which may have been affected by the change in questions relates to the number of visits taken by respondents during the 4 weeks prior to interview.

The results obtained from this question are presented in Table 3; the base is all respondents including non-participants, i.e. those who had not participated in any outdoor recreation trips in the last 4 weeks.

The results obtained with the new questions were higher than those obtained with the original questions in three of the four months (June, January and February) but marginally lower during the highest participation month of July.

Table 3 Mean number of visits in the last four weeks (including non-participants)

	Result with original questions	Result with new questions	Difference	Significant difference using two sample <i>t</i> -test?*
June 2006	5.30	5.72	+0.42	n
July 2006	6.83	6.70	-0.13	n
January 2007	5.65	5.91	+0.26	n
February 2007	5.40	6.25	+0.85	n
Average (mean)	5.78	6.14	+0.36	n

* The result from the one sample *t*-test also shows that for this question there is not enough evidence to say that there is a significant difference between the original and new questionnaires.

Whilst the results here show that there is not enough evidence to say that there is a significant difference, this could be because there is not enough data to detect any change that there might be. For the previous two questions, there are two possible options – participate or not. Here, there are many more options and so by its nature, the data for this question has more variation. That makes detecting any change much harder. However, there is not enough evidence presented here to say that there is a significant difference and so that must be the conclusion.

2.4 Variations in impact of the questionnaire change across the population

While the previous sections have analysed the impact of the change in questions across all respondents, representing the adult population as a whole, it is possible that the changes to the questions have had varying levels of impact on different types of respondents within the population.

An analysis of the number of visits recorded amongst different sub-samples or groups within the population, using the original and new questions, suggests that the largest variations exist amongst members of the C1 and C2 social grades and people aged 16 to 24 and 35 to 44. This would suggest, following the questionnaire change in September 2005, frequencies of participation reported by these groups increased more than across the wider population.

3 IMPLICATIONS OF FINDINGS

During the four months of surveying undertaken for the purposes of this exercise, it was found that:

- In all four months of surveying, a larger percentage of those responding to the new questionnaire stated that they had taken visits in the 12 months prior to the interview. However, it is not possible to quantify the size of the difference due to the clustering of the three data points and the one anomalous data point.
- In all four months of surveying, a larger percentage of those responding to the new questionnaire stated that they had taken visits in the 4 weeks prior to the interview. However, further analysis showed that there was not enough evidence to say that this was a significant difference.
- In three of the four months of surveying, the mean number of visits reported per respondent was higher amongst those interviewed using the new questionnaire. However, further analysis showed that there was not enough evidence to say that this was a significant difference.

Although the results from the question regarding participation in the twelve months prior to interview showed that there was a significant difference between the original and new questionnaires, it is recommended that there is no attempt to adjust the results prior to the questionnaire change. This is because there is no reliable way to estimate the difference, due to the clustering of the three data points and the one unusual data point. If the data was more evenly spread, a more reliable estimation could be made.

The results from the questions regarding the participation and the frequency of visits in the four weeks prior to interview showed that there was not enough evidence to say that there was a significant difference between the original and new questionnaires. There could be genuinely no difference, or it could be that there was not enough data collected to detect a difference. It is the frequency of visits data that is used subsequently in the annual reports to provide an estimated annual, countrywide figure for the general public's participation in outdoor recreation.

It has therefore been concluded that the results regarding participation levels based upon data collected before September 2005 should not routinely be presented alongside those collected more recently. Where these results are presented, they should be accompanied by

an explanatory note regarding the questionnaire change, possible impact and a reference to this calibration exercise.

Appendix 1 Changes to questions

Before September 2005

Q1 First of all, have you made any visits to the outdoors for leisure and recreation in Scotland in the last 12 months? This leisure trip could either have been from home or while you were away from home on holiday, provided the holiday was in Scotland. By outdoors, we mean to open spaces in the countryside as well as in towns and cities such as woodland, parks, farmland, paths, beaches etc

Yes

No

Q2a Still thinking about the last 12 months how often, on average, have you made a visit to the outdoors for leisure and recreation in the last 12 months in the summer months of April-September?

More than once per day

Every day

Several times a week

Once a week

Once or twice a month

Once every 2-3 months

Once or twice

Q2b And how often, on average, have you made a visit to the outdoors for leisure and recreation in the last 12 months in the winter months of October-March?

More than once per day

Every day

Several times a week

Once a week

Once or twice a month

Once every 2-3 months

Once or twice

Q3 How many visits to the outdoors for leisure and recreation in Scotland have you made in the last 4 weeks?

PROBE: You may have made more than one visit to the outdoors for leisure and recreation each day.

Appendix 1 (Continued)

September 2005 onwards

Q1 Firstly, how often, on average, have you taken visits to the outdoors for leisure and recreation in Scotland in the last 12 months?

These leisure trips could either have been from home or while you were away from home on holiday, provided the holiday was in Scotland. By outdoors, we mean to open spaces in the countryside as well as in towns and cities such as woodland, parks, farmland, paths, beaches etc.

More than once per day

Every day

Several times a week

Once a week

Once or twice a month

Once every 2-3 months

Once or twice

Never

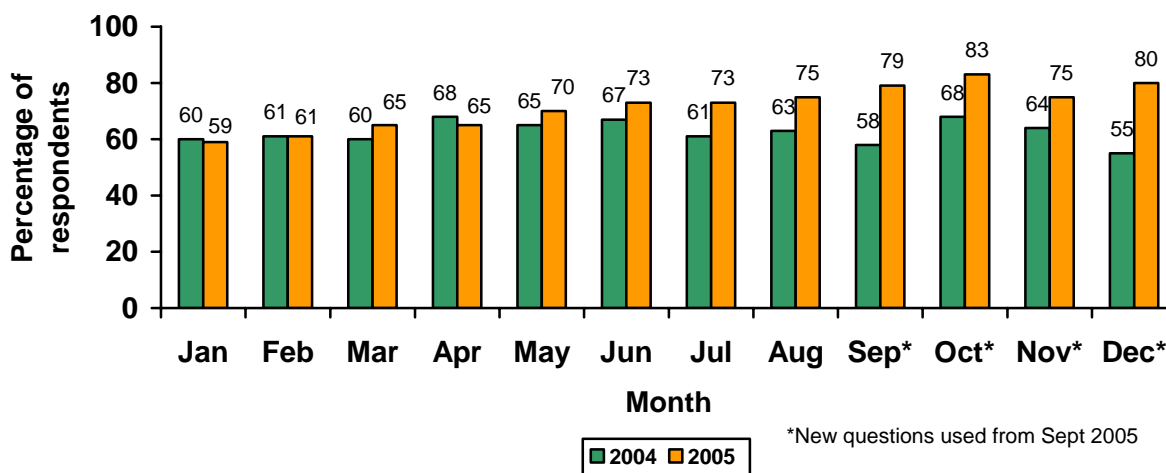
Q2 How many visits to the outdoors for leisure and recreation in Scotland have you made in the last 4 weeks?

PROBE: You may have made more than one visit to the outdoors for leisure and recreation each day.

Appendix 2 Outdoor recreation visits in 2004 and 2005

This appendix presents data from 2004 and 2005, showing the variations which were observed when undertaking the yearly analysis for 2005, which resulted in the calibration exercise being undertaken.

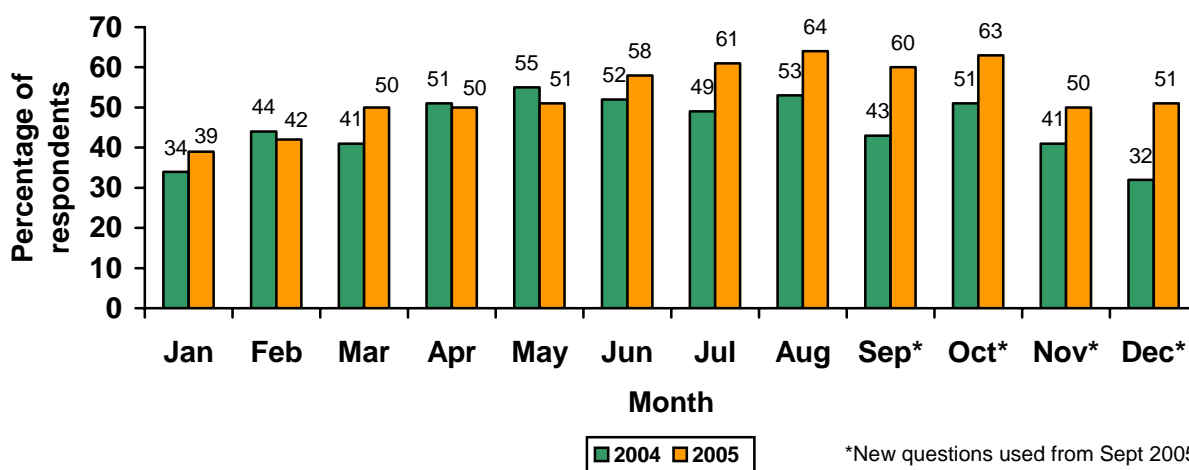
Percentage of respondents taking outdoor recreation visits in the 12 months prior to interview



The new questionnaire was introduced in September 2005.

Comparing the results obtained regarding visits taken in the 12 months prior to interview, a mean result of 63% was obtained between January and August in 2004, while a mean result of 68% was obtained in 2005, a 5 percentage point difference. However comparing the mean results obtained each year between September and December, a result of 61% was obtained in 2004 and a result of 79% was obtained in 2005, an 18 percentage point difference.

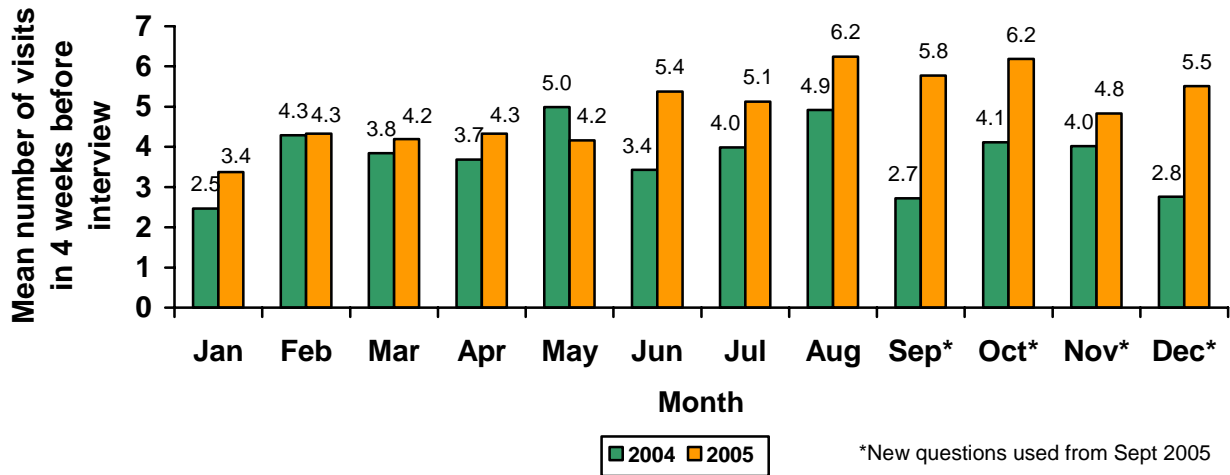
Percentage of respondents taking outdoor recreation visits in the 4 weeks prior to interview



Comparing the results obtained regarding visits taken in the 4 weeks prior to interview,

between January and August, a mean result of 47% was obtained in 2004 while a mean result of 52% was obtained in 2005, a 5 percentage point difference. Comparing the results obtained each year between September and December, a result of 42% was obtained in 2004 and a result of 56% was obtained in 2005, a 14 percentage point difference.

Mean number of outdoor recreation visits taken in the 4 weeks prior to interview (including non-participants)



Comparing the results obtained regarding the number of visits taken in the 4 weeks prior to interview, between January and August, a mean result of 3.5 was obtained in 2004 while a mean result of 4.1 was obtained in 2005, a year on year increase of 17%. Comparing the results regarding the number of visits taken in the 4 weeks prior to interview obtained between September and December, a mean result of 3.4 visits was obtained in 2004 while a result of 5.6 was obtained in 2005, an increase of 65%.