# *Ozone Action! Days in West Michigan: Citizen Awareness and Compliance*

***Prepared for the***
***West Michigan Clean Air Coalition***

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## EXECUTIVE SUMMARY

In the summer of 2001, the West Michigan Clean Air Coalition contracted with the Carl Frost Center for Social Science Research to conduct a telephone survey of Kent, Muskegon, and Ottawa County residents. The purpose of the survey was to assess citizens' awareness of Ozone Action! Days, citizens' knowledge of recommended actions to take on those days, the extent to which citizens engaged in those actions, and citizens' reasons for participating in Ozone Action! Days. The Frost Center completed a total of 400 surveys via telephone during September 2001. The survey instrument was similar to that used for the evaluation in 1998. Many of the questions related to citizens' sources of information were deleted from this version because that information was not deemed as important as other information on the survey.

### Awareness of Ozone Action! Days

Respondents were asked to classify themselves as being *very aware, somewhat aware*, or *not at all aware* about Ozone Action! Days. Approximately one-third of residents (31.6%) indicated they were very aware. This is up noticeably from 1998, when only 19.8% indicated they were very aware. Another half (49.6%) indicated they were somewhat aware. Only 21.6% said they were not at all aware. Most of the other questions in the survey were asked of those who reported they were either very aware or somewhat aware. Of the women in the sample, 35.0% reported they

were very aware compared to 26.1% of men in the sample. This gender difference was not present in 1998.

**Knowledge Related to Ozone Action! Days**

When asked to define Ozone Action! Days, the components of the definition most often identified by citizens were a *day to take voluntary action* (59.1%), a *hot muggy day* (31.3%), and a *day when air pollution is high* (26.5%). (These components were identified in advance. Since definitions could have more than one of these components, totals sum to more than 100%.) There were 12 Ozone Action! Days called during 2001. Using plus or minus three as an arbitrary cut-off, we found that 14.0% of respondents recalled between 9 and 15 days. Although such a specific memory is difficult to assess, and research in psychology clearly shows the fallibility of this type of recall over a long time delay, it seems clear that only a minority of respondents are accurately cued into the frequency of Ozone Action! Days. Respondents were asked to generate any actions they could think of that were suggested on Ozone Action! Days. Interviewers from the Frost Research Center categorized these responses. The most common categories of response were *don't mow grass* and *don't refuel/wait to refuel*.

**Behaviors Related to Ozone Action! Days**

Of those who indicated they could name at least one recommended activity/restraint on an Ozone Action! Day, 67.8% said they were engaged in voluntary actions on *most, all* or *almost all* of the Ozone Action! Days. Those who reported that they did not always participate were asked why they did not. The most common

categorization of responses to this question was *not convenient* (44.7%). The most common classification of reasons for participating was concern for the environment (65.5%).

**Sources of Information Regarding Ozone Action! Days**

Citizens reported that their main sources of information about Ozone Action! Days were television news, local radio, and local newspapers. This was true for receiving general information about Ozone Action! Days and also how they learned that an Ozone Action! Day would be called. Most residents indicated that they learned that it was an Ozone Action! Day during the morning (67.2%), with most of the others (28.1%) learning of it the night before.

**Profiles of Citizens by Different Levels of Awareness**

We developed statistical profiles of the high (very aware) and low (not at all aware) levels of awareness of Ozone Action! Days. Specifically, we found that very-aware citizens were more likely to be 35-54 years old (47.2% vs. 40.5% of total sample) and more likely to be female (68.3% vs. 61.5% of total sample). Not-at-all-aware citizens were more likely to be 18-24 or over 65 (41.3% vs. 29.1% of total sample), more likely to be a high school/GED grad or less (56.0% vs. 32.8% of total sample), and more likely to be male (46.5% vs. 38.5% of total sample).

## BACKGROUND

In the summer of 2001, the West Michigan Clean Air Coalition contracted with the Carl Frost Center for Social Science Research to conduct a telephone survey of Kent, Muskegon, and Ottawa County residents. The purpose of the survey was to assess 1) citizens' awareness of Ozone Action! Days, 2) knowledge of recommended actions citizens should take on those days, 3) the extent to which citizens engage in those actions, and 4) citizens' reasons for participating in Ozone Action! Days. This evaluation was similar to the evaluation conducted by the Frost Center for the West Michigan Clean Air Coalition in 1998, with some of the same survey items used in both 1998 and 2001. The Frost Center conducted calls during September 2001, near the very end of the Ozone Action! season.

## METHODS

A total of 400 residents participated in the telephone survey. Lists of randomly selected, directory-listed telephone numbers from Kent, Muskegon, and Ottawa counties were purchased from Survey Sampling, Inc. of Fairfield, Connecticut.

Trained telephone callers (mostly Hope College students) from the Frost Research Center introduced themselves to the residents and described the project. They asked residents if they would be willing to take a few minutes and answer questions about Ozone Action! Days. Once they agreed to participate, residents were first asked if they lived in Kent, Muskegon, or Ottawa County. If residents did not live in one of the three counties or were not sure, they were told the survey was of Kent, Muskegon, and Ottawa County residents and the interviewer moved on to the next phone number. Each working phone number was attempted up to four times or until a resident either completed the survey or declined to participate.

A survey was considered complete if the interviewer asked all of the questions of the respondent. However, residents could choose not to answer some questions or could indicate that they were not sure. Those responses were not computed in the descriptive statistics for those particular questions. Thus, not all questions have responses from all of the participants.

A margin of error on a sample of 400 (with 95% confidence) is ±4.9% for two-choice questions (such as whether or not a resident was aware of a particular voluntary action). A margin of error on a sample of 400 (with 95% confidence) is ±4.2% for four-choice questions (such as frequency of engaging in voluntary actions).

For most questions, we examined differences to determine if sub-groups in the sample had different responses. Specifically we examined differences between levels of awareness of Ozone Action! Days. In the tables we present these differences and note where they are statistically significant.[1]

[1] A statistically significant finding is one in which the difference between two values is large enough that it is unlikely to have occurred by chance. In other words, if a difference has a probability (p) value of less than .05, it means that a difference this large will only occur by chance less than 5% of the time (upon repeated sampling of this population). This is the standard level of significance accepted by social scientists.

## SURVEY INSTRUMENT

Members of the Frost Research Center staff met with Steve Bulthuis of the Macatawa Area Coordinating Council to revise the survey administered in 1998. We received additional suggestions from other members of the West Michigan Clean Air Coalition and then wrote the final version of the survey. A number of open-ended questions, in which respondents provide information without receiving prompts from the interviewer, were included in the survey. The telephone interview took approximately 10 minutes to complete and contained questions concerning

- respondents' general awareness of Ozone Action! Days,
- their knowledge of what they should do on an Ozone Action! Day,
- the extent to which they participate in voluntary actions,
- the reasons they participate (if they do),
- their perceptions of air pollution and ground level ozone problems in their community, and
- demographic information about the respondents.

This survey contained many of the same questions as the 1998 evaluation. Some modifications were made to this year's survey. The most notable change was deletion of several questions regarding citizens' specific sources of information of Ozone Action! Days (e.g. the call letters of a radio or television station). The West Michigan Clean Air Coalition did not feel this level of specificity added enough value to warrant the additional time/effort necessary to collect the information.

## DATA ANALYSIS

The Frost Research Center used the Statistical Package for the Social Sciences (SPSS) for data compilation and analysis. We created frequency tables for each question. When the survey question measured incremental responses (e.g., *very aware*, *somewhat aware*, *not at all aware*), a numerical value was assigned to each response. This allowed for computation of mean scores for such questions, which provides ease of comparison across questions with similar response alternatives.

Where appropriate, we present the calculated means for such questions. Also where applicable, tables from the 1998 report are included for comparison.[2] Frequencies are the number of respondents who gave specific answers to particular questions. The mean is the "average" response to the question. We also provide percentages of response alternatives when appropriate. Occasionally (e.g., Table 16a, page 34), we conduct tests to determine if scores from different groups were statistically significant from each other. We do not do significance tests on *other* categories because of the large variance in types of responses.

[2] The data from the 1998 report are slightly different than the 1998 data reported here. The difference derives from all respondents being computed in the total in 1998 report. In this report, we consider only those respondents who answered that particular question. This changes the percentages on some tables slightly, usually by one or two percentage points. The 1998 tables that are affected in this report are: Table 2b, Table 8b, Table 9b, Table 27b, Table 28b, Table 29b, and Table 30b.

## AWARENESS OF OZONE ACTION! DAYS

We asked respondents how aware they were of Ozone Action! Days. One-third (31.6%) reported they were *very aware*, almost half (46.9%) indicated they were *somewhat aware*, and 21.6% indicated they were *not at all aware* (Table 1a, page 10). Respondents who were *very aware* or *somewhat aware* answered a number of additional questions pertaining to Ozone Action! Days. We present this table first because this classification of *very aware*, *somewhat aware*, and *not at all aware* is used as a cross-tabulated variable in other parts of this report.

More respondents indicated they were *very aware* in 2001 than in 1998 (31.6% vs. 19.8%); this represents an increase of 62.7% (Table 1b, page 10). Such a marked increase is striking in a three-year period. This provides indirect evidence that information campaigns are effective. Clearly, however, there is still a noticeable minority (21.6%) not aware of Ozone Action! Days.

Table 1a

| Respondents' Awareness of Ozone Action! Days 2001 Results | | |
|---|---|---|
| | **Frequency** | **Percent** |
| Very Aware | 126 | 31.6% |
| Somewhat Aware | 187 | 46.9 |
| Not at All Aware | 86 | 21.6 |

Table 1b

| Respondents' Awareness of Ozone Action! Days 1998 Results | | |
|---|---|---|
| | **Frequency** | **Percent** |
| Very Aware | 82 | 19.8% |
| Somewhat Aware | 229 | 55.3 |
| Not at All Aware | 103 | 24.9 |

## CHARACTERISTICS OF THE SAMPLE

### *Length of Residence*

Over half of the respondents (55.8%) have lived in West Michigan for over 30 years, 29.7% have lived in West Michigan between *11 and 30 years*, and 14.4% have lived in West Michigan for *10 years or less* (Table 2a, page 14). There was a slight increase in the number of people who have lived in West Michigan for *over 30 years* compared to the 1998 survey (55.8% vs. 48.3%). There appears to be no clear relationship between length of time residing in the area and awareness of Ozone Action! Days. This is perhaps not surprising, as the Ozone Action! program is relatively new (since 1995).

### *Place of Residence*

The majority of the sample (58.0%) were *Kent County residents*, 28.0% were *Ottawa County residents* and 14.0% were *Muskegon County residents* (Table 3a, page 15). These figures are consistent with 2000 Census information; overall population figures show that the tri-county area is comprised of 58.4% Kent, 24.1% Ottawa, and 17.5% Muskegon county. Tables 4, 5, and 6 (pages 16 to 18) present cities and townships of the three counties in which the respondents live.

### *Age*

Ages of respondents are presented in Table 7a (page 19). The youngest age group (18-24) was the least informed of Ozone Action! Days. Only 18.8% of *18-24 year-olds* reported being *very aware* and 40.6% reported being *not at all aware*. Similarly,

the oldest age group (65 and over) was not very informed. For example, only 28.8% of the *65-and-over group* reported being *very aware* (the lowest percentage besides the 18-24 group) and 25.0% reported being *not at all aware* (the highest percentage besides the 18-24 group). As shown in Table 7b (page 19), a similar trend was present in 1998.

***Level of Education***

One-third (32.8%) of the respondents had a *high school education or less*, 30.0% had *some college or a technical/Associate Degree*, and over one-third (37.1%) had *at least a college degree* (Table 8a, page 20). Citizens with *some college or technical school or higher* were more likely to be at least *somewhat aware* of Ozone Action! Days. For example, 37.9% of those with a *college degree* reported being *very aware*, compared to 20.8% of those with *less than a high school degree*. The relationship of awareness and education is not directly linear, though, as evidenced by the fact that the percentage of awareness actually drops to 25.9% for those with *post-college training*. The distributions were similar to those found in 1998, with the exception of the *post-college* finding. In 1998, the highest degree of awareness came from those with *post-college* training.

***Ethnicity***

The majority of the respondents (95.4%) in the sample are *white*, followed by 2.6% *African-American*, 0.8% *Hispanic*, 0.3% *Asian-American*, and 1.0% who categorize themselves as *other* (Table 9a, page 21). Similar distributions were present in 1998.

***Annual Household Income***

Nearly half (44.6%) chose not to answer this question (Table 10a, page 22). Of those who answered the question, 29.3% have an annual household income between *$25,000 and $50,000*. The annual household incomes for this survey are higher than in 1998.

***Gender***

*Females* represent 61.5% of the sample, *males* represent 38.5% (Table 11a, page 23). *Females* were more likely than *males* to be *very aware* (35.0% vs. 26.1%) of Ozone Action! Days. This trend did not occur in the 1998 results. *Males* were more likely to be *not very aware* (26.1% vs. 18.7%). This trend was present in 1998.

Table 2a

| Number of Years Respondent has Lived in West Michigan (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Mean** |
| 1-5 years | 38/9.6% | 9/23.7% | 21/55.3% | 8/21.1% | 2.0 |
| 6-10 years | 19/4.8 | 7/36.8 | 9/47.4 | 3/15.8 | 1.8 |
| 11-20 years | 57/14.5 | 16/28.1 | 23/40.4 | 18/31.6 | 2.0 |
| 21-30 years | 60/15.2 | 23/38.3 | 25/41.7 | 12/20.0 | 1.8 |
| 31-40 years | 69/17.5 | 23/33.3 | 31/44.9 | 15/21.7 | 1.9 |
| 41-50 years | 62/15.7 | 20/32.8 | 34/55.7 | 7/11.5 | 1.8 |
| Over 50 years | 89/22.6 | 26/29.2 | 41/46.1 | 22/24.7 | 2.0 |
| Column Frequency/% | | 124/31.6 | 184/46.8 | 85/21.6 | |

Table 2b

| Number of Years Respondent has Lived in West Michigan (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** | **Not at All Aware** | **Mean** |
| 1-5 years | 27/6.5% | 3/11.1% | 18/66.7% | 6/22.2% | 2.1 |
| 6-10 years | 30/7.2 | 9/30.0 | 12/40.0 | 9/30.0 | 2.0 |
| 11-20 years | 52/12.6 | 5/9.6 | 29/55.8 | 18/34.6 | 2.3 |
| 21-30 years | 85/20.5 | 8/9.4 | 61/71.8 | 16/18.8 | 2.1 |
| 31-40 years | 75/18.1 | 20/26.6 | 47/62.7 | 8/10.7 | 1.8 |
| 41-50 years | 47/11.4 | 12/25.5 | 26/55.3 | 9/19.1 | 1.9 |
| Over 50 years | 78/18.8 | 23/29.5 | 29/37.2 | 26/33.3 | 2.0 |
| Column Frequency/% | | 80/19.3 | 222/53.6 | 92/22.2 | |

Table 3a

| County Respondent Lives In (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Mean** |
| Kent County | 232/58.0% | 81/35.1% | 103/44.6% | 47/20.3% | 1.9 |
| Muskegon County | 56/14.0 | 7/12.5 | 27/48.2 | 22/39.3 | 2.3 |
| Ottawa County | 112/28.0 | 38/33.9 | 57/50.9 | 17/15.2 | 1.8 |
| Column Frequency/% | | 126/31.6 | 187/46.9 | 86/21.6 | |

Table 3b

| County Respondent Lives In (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** | **Not at All Aware** | **Mean** |
| Kent County | 236/57.0% | 57/24.2% | 125/53.0% | 54/22.9% | 2.0 |
| Muskegon County | 84/20.3 | 10/11.9 | 43/51.2 | 31/36.9 | 2.3 |
| Ottawa County | 94/22.7 | 15/16.0 | 61/64.9 | 18/19.1 | 2.0 |
| Column Frequency/% | | 82/19.8 | 229/55.3 | 103/24.9 | |

Table 4

| City or Township Respondent Lives In Kent County 2001 Results | | |
|---|---|---|
| | **Frequency** | **Percent** |
| Ada Township | 12 | 5.2% |
| Algoma Township | 2 | 0.9 |
| Alpine Township | 3 | 1.3 |
| Bowne Township | 1 | 0.4 |
| Byron Township | 10 | 4.4 |
| Caledonia Township | 4 | 1.7 |
| Cannon Township | 1 | 0.4 |
| Cascade Township | 4 | 1.7 |
| Cedar Springs City | 3 | 1.3 |
| Courtland Township | 4 | 1.7 |
| East Grand Rapids City | 2 | 0.9 |
| Gaines Township | 5 | 2.2 |
| Grand Rapids City | 77 | 33.6 |
| Grand Rapids Charter Township | 1 | 0.4 |
| Grandville City | 15 | 6.6 |
| Grattan Township | 0 | 0.0 |
| Kentwood City | 16 | 7.0 |
| Lowell City | 0 | 0.0 |
| Lowell Township | 2 | 0.9 |
| Nelson Township | 0 | 0.0 |
| Oakfield Township | 2 | 0.9 |
| Plainfield Township | 15 | 6.6 |
| Rockford City | 5 | 2.2 |
| Solon Township | 0 | 0.0 |
| Sparta Township | 6 | 2.6 |
| Spencer Township | 0 | 0.0 |
| Tyrone Township | 0 | 0.0 |
| Vergennes Township | 2 | 0.9 |

| | | |
|---|---|---|
| Walker City | 8 | 3.5 |
| Wyoming City | 27 | 11.8 |

Table 5

| City or Township Respondent Lives In Muskegon County 2001 Results | | |
|---|---|---|
| | **Frequency** | **Percent** |
| Blue Lake Township | 0 | 0.0% |
| Casnovia Township | 1 | 1.8 |
| Cedar Creek Township | 1 | 1.8 |
| Dalton Township | 0 | 0.0 |
| Egelston Township | 1 | 1.8 |
| Fruitland Township | 0 | 0.0 |
| Fruitport Township | 4 | 7.3 |
| Holton Township | 3 | 5.5 |
| Laketon Township | 3 | 5.5 |
| Montague City | 0 | 0.0 |
| Montague Township | 1 | 1.8 |
| Moorland Township | 0 | 0.0 |
| Muskegon City | 12 | 21.8 |
| Muskegon Township | 14 | 25.5 |
| Muskegon Heights City | 0 | 0.0 |
| North Muskegon City | 3 | 5.5 |
| Norton Shores City | 8 | 14.5 |
| Ravenna Township | 1 | 1.8 |
| Roosevelt Park City | 1 | 1.8 |
| Sullivan Township | 1 | 1.8 |
| Whitehall City | 1 | 1.8 |
| Whitehall Township | 0 | 0.0 |
| White River Township | 0 | 0.0 |

Table 6

| City or Township Respondent Lives In Ottawa County 2001 Results | | |
|---|---|---|
| | **Frequency** | **Percent** |
| Allendale Township | 5 | 4.5% |
| Blendon Township | 2 | 1.8 |
| Chester Township | 0 | 0.0 |
| Coopersville City | 5 | 4.5 |
| Crockery Township | 0 | 0.0 |
| Ferrysburg City | 1 | 0.9 |
| Georgetown Township | 21 | 19.1 |
| Grand Haven City | 5 | 4.5 |
| Grand Haven Township | 7 | 6.4 |
| Holland City | 16 | 14.5 |
| Holland Township | 10 | 9.1 |
| Hudsonville City | 7 | 6.4 |
| Jamestown Township | 0 | 0.0 |
| Olive Township | 0 | 0.0 |
| Park Township | 10 | 9.1 |
| Polkton Township | 1 | 0.9 |
| Port Sheldon Township | 5 | 4.5 |
| Robinson Township | 2 | 1.8 |
| Spring Lake Township | 1 | 0.9 |
| Tallmadge Township | 4 | 3.6 |
| Wright Township | 0 | 0.0 |
| Zeeland City | 1 | 0.9 |
| Zeeland Township | 6 | 5.5 |

Table 7a

| Age of Respondent (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Mean** |
| 18-24 | 32/8.3% | 6/18.8% | 13/40.6% | 13/40.6% | 2.2 |
| 25-34 | 79/20.5 | 25/31.6 | 40/50.6 | 14/17.7 | 1.9 |
| 35-44 | 87/22.6 | 29/33.3 | 43/49.4 | 15/17.2 | 1.8 |
| 45-54 | 69/17.9 | 29/42.6 | 27/39.7 | 12/17.6 | 1.8 |
| 55-64 | 38/10.0 | 11/28.9 | 21/55.3 | 6/15.8 | 1.9 |
| 65 and over | 80/20.8 | 23/28.8 | 37/46.3 | 20/25.0 | 2.0 |
| Column Frequency/% | | 123/32.0 | 181/47.1 | 80/20.8 | |

Table 7b

| Age of Respondent (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** | **Not at All Aware** | **Mean** |
| 18-24 | 72/17.4% | 5/6.9% | 35/48.6% | 32/44.4% | 2.4 |
| 25-34 | 108/26.1 | 25/23.2 | 69/63.9 | 14/13.0 | 1.9 |
| 35-44 | 87/21.0 | 17/19.5 | 54/62.1 | 16/18.4 | 2.0 |
| 45-54 | 52/12.6 | 12/23.1 | 30/57.7 | 10/19.2 | 2.0 |
| 55-64 | 38/9.2 | 13/34.2 | 17/44.7 | 8/21.1 | 1.9 |
| 65 and over | 57/13.8 | 10/17.5 | 24/42.1 | 23/40.3 | 2.2 |
| Column Frequency/% | | 82/19.8 | 229/55.3 | 103/24.9 | |

Table 8a

| Highest Level of Education Respondent has Completed (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Mean** |
| Less than high school | 24/6.1% | 5/20.8% | 8/33.3% | 11/45.8% | 2.3 |
| High school or GED | 105/26.7 | 27/25.7 | 42/40.0 | 36/34.3 | 2.1 |
| Some college/tech or Tech/Associate Degree | 118/30.0 | 42/35.6 | 54/45.8 | 22/18.6 | 1.8 |
| College Degree | 87/22.1 | 33/37.9 | 46/52.9 | 8/9.2 | 1.7 |
| Some graduate work or higher | 59/15.0 | 15/25.9 | 36/62.1 | 7/12.1 | 1.9 |
| Column Frequency/% | | 122/31.1 | 186/47.4 | 84/21.4 | |

Table 8b

| Highest Level of Education Respondent has Completed (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** | **Not at All Aware** | **Mean** |
| Less than high school | 26/6.6% | 4/15.4% | 12/46.2% | 10/38.5% | 2.2 |
| High school or GED | 119/30.3 | 22/18.5 | 64/53.8 | 33/27.7 | 2.1 |
| Some college/tech or Tech/Associate Degree | 105/26.7 | 17/16.2 | 54/51.4 | 34/32.4 | 2.2 |
| College Degree | 97/24.7 | 22/22.7 | 64/66.0 | 11/11.3 | 1.9 |
| Some graduate work or higher | 46/11.7 | 15/32.6 | 26/56.5 | 5/10.9 | 1.8 |
| Column Frequency/% | | 80/19.3 | 220/53.1 | 93/22.5 | |

Table 9a

| Race or Ethnicity of Respondent (Frequency/Percent) 2001 Results | |
|---|---|
| | **Total** |
| African-American | 10/2.6% |
| Asian-American | 1/0.3 |
| Latino/Hispanic | 3/0.8 |
| White | 371/95.4 |
| Other | 4/1.0 |

Table 9b

| Race or Ethnicity of Respondent (Frequency/Percent) 1998 Results | |
|---|---|
| | **Total** |
| African-American | 16/4.0% |
| Asian-American | 4/1.0 |
| Hispanic | 7/1.8 |
| White | 365/92.2 |
| Other | 4/1.0 |

Table 10a

| Annual Household Income of Respondent (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Mean** |
| Under $25,000 | 29/7.3% | 10/34.5% | 12/41.4% | 7/24.1% | 1.9 |
| $25,000-$50,000 | 65/16.3 | 21/32.3 | 30/46.2 | 14/21.5 | 1.9 |
| $50,000-$75,000 | 71/17.8 | 20/28.6 | 38/54.3 | 12/17.1 | 1.9 |
| $75,000 or more | 57/14.3 | 20/35.1 | 32/56.1 | 5/8.8 | 1.7 |
| No answer | 178/44.6 | 55/30.9 | 75/42.1 | 48/27.0 | 2.0 |
| Column Frequency/% | | 126/31.6 | 187/46.9 | 86/21.6 | |

Table 10b

| Annual Household Income of Respondent (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** | **Not at All Aware** | **Mean** |
| Under $25,000 | 83/20.0 | 17/20.5% | 40/48.2% | 26/31.3% | 2.1 |
| $25,000-$50,000 | 129/31.2 | 23/17.8 | 70/54.3 | 36/27.9 | 2.1 |
| $50,000-$75,000 | 47/11.4 | 14/29.8 | 26/55.3 | 7/14.9 | 1.9 |
| $75,000 or more | 56/13.5 | 11/19.6 | 36/64.3 | 9/16.1 | 2.0 |
| No answer | 99/23.9 | 17/17.2 | 57/57.6 | 25/25.3 | 2.1 |
| Column Frequency/% | | 82/19.8 | 229/55.3 | 103/24.9 | |

Table 11a

| Gender of Respondent (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Mean** |
| Female | 246/61.5% | 86/35.0% | 114/46.3% | 46/18.7% | 1.8 |
| Male | 154/38.5 | 40/26.1 | 73/47.7 | 40/26.1 | 2.0 |
| Column Frequency/% | | 126/31.6 | 187/46.9 | 86/21.6 | |

Table 11b

| Gender of Respondent (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** | **Not at All Aware** | **Mean** |
| Female | 223/53.9% | 46/20.6% | 133/59.6% | 44/19.7% | 2.0 |
| Male | 191/46.1 | 36/18.8 | 96/50.3 | 59/30.9 | 2.1 |
| Column Frequency/% | | 82/19.8 | 229/55.3 | 103/24.9 | |

## KNOWLEDGE RELATED to OZONE ACTION! DAYS

### *Definition of Ozone Action! Days*

We asked respondents who were at least *somewhat aware* of Ozone Action! Days to provide a definition of Ozone Action! Days in their own words (Table 12a, page 29). Members of the West Michigan Clean Air Coalition provided us with the components of their own definition so that we could determine which aspects of Ozone Action! Days were best known to the public. The most common categorization was that these days are ones during which people *undertake voluntary actions*, mentioned by 59.1% of the respondents. This is down from 64.6% from 1998. The second-most common response was that ozone is likely to be high on *hot, muggy, hazy days*. This was mentioned by 31.3% of the respondents, which is up from 18.6% in 1998. *A day when air pollution is high* was mentioned by 26.5% of the respondents, up from 16.4% in 1998. *Exceedence of acceptable ozone levels* (21.1% in 2001 vs. 12.5% in 1998) and *A day when it is unhealthy to be outdoors* (10.2% in 2001 vs. 1.3% in 1998) also were mentioned more often in 2001. A total of 10.9% of the responses did not fit well into any of the pre-set categories. Appendix A shows these responses (page 59). In 1998, there was generally good understanding of the *what* of Ozone Action! Days (day to take voluntary actions), but very little awareness of the *why*. In 2001, the *what* (voluntary actions, hot days) has stayed relatively the same, but there is increased understanding of the *why* (*pollution is high, exceedence of acceptable levels*). It is important to keep in mind that these categorizations are made “on the fly” by Frost Center callers. Although we spend time training them and, we suspect, they get better as they gain experience, it is also

true that with any coding scheme in social research there is variability between raters. We feel confident that this information is as valid as it can be, but we also recognize that such a procedure does involve judgments that likely differ between people.

We took the four reasons for calling an Ozone Action! Day that were listed in the definition we received from the West Michigan Clean Air Coalition (*hot/muggy/hazy day, day when air pollution is high, exceedence of acceptable ozone levels*, and *day when it is unhealthy to be outdoors*).[3] We then calculated the number of them each respondent mentioned. As you can see in Table 13a (page 30), four in ten respondents failed to mention even one reason. However, this is lower than in 1998, when 58.5% were unable to mention one of these four reasons. It is also noticeably lower among those indicating they were *very aware* (28.6%). Nearly one-fourth (23.4%) of the total sample could identify two or more reasons for calling an Ozone day. This was noticeably higher than 6.5% found in 1998*. Very-aware* citizens cited two or more reasons (33.4%) more often than *somewhat-aware* citizens (16.6%).

We also calculated the mean number of reasons citizens gave as part of their Ozone Action! definition. There was an increase in the number of reasons both the *very-aware* and *somewhat-aware* citizens were able to give in 2001. In 2001, *very-aware* citizens gave an average of 1.13 reasons compared to 0.61 in 1998. In 2001, *somewhat-aware* citizens gave an average of 0.73 compared to 0.45 in 1998. In

[3] The category *a day to take voluntary action* was not included in this analysis, because it is not part of the definition of when to call an Ozone Action! Day. It is mentioned often, so we reported it in Table 12a.

1998, many West Michigan citizens understood that they were supposed to do something on Ozone Action! Days, but very few could offer an explanation as to why. In 2001, West Michigan citizens understand they are supposed to do something on Ozone Action! Days, and many more can offer an explanation as to why they are taking these voluntary actions.

***Number of Ozone Action! Days Respondents Recalled***

During the 2001 Ozone Action! season, there were twelve declared Ozone Action! Days in Western Michigan. Just over half of *very-aware* citizens (54.8%) recalled between three and six Ozone Action! Days during 2001, and 57.8% of the *somewhat-aware* citizens recalled between two and six days (Table 14, page 31). Very few remembered anywhere near twelve days. Of course, this could be a difficulty in memory, but it raises the strong possibility that even aware citizens only know of one-fourth to one-half of all Ozone Action! Days.

Another way to analyze this question is to look at the percentage of respondents indicating they remembered, within a range of plus or minus three days, the correct number of days called. Among all respondents in this sample, 14.0% recalled between 9 and 15 days. Of respondents who were *very aware*, 15.1% recalled between 9 and 15 days. Similarly, 13.3% of those who were *somewhat aware* recalled between 9 and 15 days. Although the range of plus or minus three days is arbitrary, this analysis shows that memory for Ozone Action! Days is incomplete, even among high-information residents.

### *Awareness of Voluntary Actions*

The West Michigan Clean Air Coalition suggests a number of voluntary actions citizens can take on Ozone Action! Days. We asked respondents to name the actions with which they were familiar (Table 15a, page 32). Their answers were "open-ended" (that is, the respondents generated them on their own rather than responding to a list we provided). Callers were trained to record categories based on citizens' responses. The two most common responses were *don't mow grass* (85.7% for *very aware*, 81.3% for *somewhat aware*), and *don't refuel/wait until evening to refuel* (77.8% for *very aware*, 71.1% for *somewhat aware*). There were no statistically significant differences between *very-aware* and *somewhat-aware* citizens. In 1998, there were six statistically significant differences between *very-aware* and *somewhat-aware* citizens. (Specifically, in 1998 *very-aware* residents showed greater knowledge of 1) *no mowing*, 2) *no/delayed refueling*, 3) *carpooling*, 4) *no lighter fluid*, 5) *bicycling*, and 6) *keeping equipment well maintained* – Table 15b, page 33.) A total of 8.4% of the responses did not fit well into any of the pre-set categories. These responses are shown in Appendix B (page 60).

We tallied the number of responses each citizen offered to determine frequency of responses across people (rather than across action). When analyzing the data in this way, we found that 51.6% of *very-aware* citizens could name three or more activities/restraints that should be performed on high ozone days. A total of 44.5% could name one or two actions and only 4.0% of the *very-aware* citizens could not name any action (Table 16a, page 34). Knowledge was, as expected, lower for

those who self-reported they were only *somewhat aware*. For the *somewhat-aware* respondents, 41.7% could name three or more actions, 50.8% could name one or two and 7.5% could not name any action. On average, *very-aware* citizens could name 2.91 actions, and *somewhat-aware* citizens could name 2.53. (The statistical test—using a t-test—is statistically significant at $\underline{p}<.05$.) Although the difference between these two means is statistically significant, the difference is smaller than it was in 1998 (*very aware* = 2.87 and *somewhat aware* = 1.97 in 1998, compared to *very aware* = 2.91 and *somewhat aware* = 2.53 in 2001). *Somewhat-aware* citizens were able to name more voluntary actions in 2001 than in 1998 (2.53 vs. 1.97). Furthermore, the average number of actions recalled is greater in 2001 than in 1998 (2.68 vs. 2.21).[4]

### *Number of Years Aware of Ozone Action! Days*

Ozone Action! Days have been in effect in West Michigan since 1995. Using plus or minus two as an arbitrary marker, we find that 31.7% reported being aware of Ozone Action! Days being in existence between five and nine years (Table 17, page 35). Slightly more (35.0%) of the *very-aware* residents reported the five to nine year range than *somewhat-aware* residents (29.6%).

[4] We did not perform statistical tests on the differences between the 1998 and 2001 data. Researchers are cautious to make such inferences across two different datasets. Thus, we just present the descriptive values. Any reference to differences across the two data sets is simply a statement of numerical differences rather than a statement of statistical significance.

Table 12a

| Definition of an Ozone Action! Day (Frequency/Percent of Those Who are Aware) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Day to undertake voluntary actions | 185/59.1% | 75/59.5% | 110/58.8% |
| Hot, muggy, hazy days | 98/31.3 | 40/31.7 | 58/31.0 |
| Day when air pollution is high | 83/26.5 | 50/39.7 | 33/17.6 |
| Exceedence of acceptable ozone levels | 66/21.1 | 33/26.2 | 33/17.6 |
| Day when it is unhealthy to be outdoors | 32/10.2 | 20/15.9 | 12/6.4 |
| Other | 34/10.9 | 10/7.9 | 24/12.8 |

Table 12b

| Definition of an Ozone Action! Day (Frequency/Percent of Those Who are Aware) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Day to undertake voluntary actions | 201/64.6% | 49/59.8 % | 152/66.4% |
| Hot, muggy, hazy days | 58/18.6 | 21/25.6 | 37/16.2 |
| Day when air pollution is high | 51/16.4 | 16/19.5 | 35/15.3 |
| Exceedence of acceptable ozone levels | 39/12.5 | 10/12.2 | 29/12.7 |
| Day when it is unhealthy to be outdoors | 4/1.3 | 3/3.7 | 1/.4 |
| Other | 22/7.1 | 7/8.5 | 15/6.6 |

Table 13a

| Number of Reasons for Ozone Action! Days Respondent Can Name (Frequency/Percent of Those Who are Aware) 2001 Results | | | |
|---|---|---|---|
| **Number of Reasons Mentioned** | **Total** | **Very Aware** | |
| None | 123/39.3% | 36/28.6% | |
| 1 | 117/37.4 | 48/38.1 | |
| 2 | 60/19.2 | 34/27.0 | |
| 3-4 | 13/4.2 | 8/6.4 | |
| Average | 0.89 | 1.13* | |

Table 13b

| Number of Reasons for Ozone Action! Days Respondent Can Name (Frequency/Percent of Those Who are Aware) 1998 Results | | | |
|---|---|---|---|
| **Number of Reasons Mentioned** | **Total** | **Very Aware** | **Somewhat Aware** |
| None | 182/58.5% | 43/52.4% | 139/60.7% |
| 1 | 109/35.0 | 30/36.6 | 79/34.5 |
| 2 | 17/5.5 | 7/8.5 | 10/4.4 |
| 3-4 | 3/1.0 | 2/2.4 | 1/.4 |
| Average | 0.49 | 0.61 | 0.45 |

Table 14

| Number of Ozone Action! Days Respondents Were Aware of During 2001 (Frequency/Percent of Those Who are Aware) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| None | 6/1.9% | 0/0.0% | 6/3.2% |
| 1 | 3/1.0 | 1/0.8 | 2/1.1 |
| 2 | 25/8.0 | 5/4.0 | 20/10.7 |
| 3 | 36/11.5 | 11/8.7 | 25/13.4 |
| 4 | 41/13.1 | 21/16.7 | 20/10.7 |
| 5 | 51/16.3 | 23/18.3 | 28/15.0 |
| 6 | 29/9.3 | 14/11.1 | 15/8.0 |
| 7 | 8/2.6 | 4/3.2 | 4/2.1 |
| 8 | 13/4.2 | 11/8.7 | 2/1.1 |
| 9 | 2/0.6 | 1/0.8 | 1/0.5 |
| 10 | 24/7.7 | 10/7.9 | 14/7.5 |
| 11 | 1/0.3 | 0/0.0 | 1/0.5 |
| 12 (correct number for 2001 season) | 9/2.9 | 3/2.4 | 6/3.2 |
| 13 | 2/0.6 | 0/0.0 | 2/1.1 |
| 14 | 1/0.3 | 1/0.8 | 0/0.0 |
| 15 | 5/1.6 | 4/3.2 | 1/0.5 |
| 17 | 1/0.3 | 0/0.0 | 1/0.5 |
| 18 | 1/0.3 | 0/0.0 | 1/0.5 |
| 20 | 7/2.2 | 5/4.0 | 2/1.1 |
| 21 | 1/0.3 | 1/0.8 | 0/0.0 |
| 24 | 1/0.3 | 1/0.8 | 0/0.0 |
| 25 | 1/0.3 | 0/0.0 | 1/0.5 |
| 28 | 7/2.2 | 1/0.8 | 6/3.2 |
| 30 | 2/0.6 | 2/1.6 | 0/0.0 |
| 40 | 1/0.3 | 1/0.8 | 0/0.0 |
| Don’t know | 35/11.2 | 6/4.8 | 29/15.5 |

Table 15a

| Awareness of Voluntary Actions (Frequency/Percent of Those Who are Aware) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Don't mow grass | 260/83.3% | 108/85.7% | 152/81.3% |
| Don't refuel/wait until evening to refuel | 231/74.0 | 98/77.8 | 133/71.1 |
| Don't top off or overfill gas tank | 73/23.4 | 31/24.6 | 42/22.5 |
| Carpool | 70/22.4 | 31/24.6 | 39/20.9 |
| Don't use gasoline powered equipment | 40/12.8 | 19/15.1 | 21/11.2 |
| Bike | 28/9.0 | 12/9.5 | 16/8.6 |
| Combine business, errands or recreational trips | 25/8.0 | 8/6.3 | 17/9.1 |
| Take a bus | 16/5.1 | 7/5.6 | 9/4.8 |
| Avoid use of charcoal lighter fluid | 15/4.8 | 9/7.1 | 6/3.2 |
| Don't idle motor | 13/4.2 | 8/6.3 | 5/2.7 |
| Don't use boat | 11/3.5 | 6/4.8 | 5/2.7 |
| Don't use aerosols | 9/2.9 | 3/2.4 | 6/3.2 |
| Avoid use of solvent-based paints | 6/1.9 | 3/2.4 | 3/1.6 |
| Avoid use of solvent-based cleaners | 5/1.6 | 2/1.6 | 3/1.6 |
| Make sure gas cap is tightly sealed | 4/1.3 | 3/2.4 | 1/0.5 |
| Avoid drive-thru service | 2/0.6 | 1/0.8 | 1/0.5 |
| Keep power equipment well maintained | 1/0.3 | 1/0.8 | 0/0.0 |
| Drive smoothly | 4/1.3 | 1/0.8 | 3/1.6 |
| Other | 27/8.7 | 16/12.7 | 11/5.9 |
| Don't know | 20/6.4 | 5/4.0 | 15/8.0 |

*Note: Respondents were able to provide more than one response. Thus, totals sum to more than 100%.*

Table 15b

| Awareness of Voluntary Actions (Frequency/Percent of Those Who are Aware) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Don't mow grass | 230/74.0% | 72/87.8%* | 158/69.0%* |
| Don't refuel/wait until evening to refuel | 168/54.0 | 57/69.5* | 111/48.5* |
| Don't top off or overfill gas tank | 85/27.3 | 28/34.1 | 57/24.9 |
| Carpool | 44/14.1 | 18/22.0* | 26/11.4* |
| Don't use gasoline powered equipment | 38/12.2 | 16/19.5 | 22/9.6 |
| Don't idle motor | 29/9.3 | 10/12.2 | 19/8.3 |
| Avoid use of charcoal lighter fluid | 25/8.0 | 13/15.9* | 12/5.2* |
| Combine business, errands or recreational trips | 17/5.5 | 3/3.7 | 14/6.1 |
| Don't use aerosols | 16/5.1 | 2/2.4 | 14/6.1 |
| Bike | 11/3.5 | 6/7.3* | 5/2.2* |
| Take a bus | 10/3.2 | 3/3.7 | 7/3.1 |
| Keep power equipment well maintained | 4/1.3 | 3/3.7* | 1/.4* |
| Avoid drive-thru service | 3/1.0 | 1/1.2 | 2/.9 |
| Make sure gas cap is tightly sealed | 3/1.0 | 2/2.4 | 1/.4 |
| Avoid use of solvent-based paints | 2/.6 | 1/1.2 | 1/.4 |
| Don't use boat | 2/.6 | 0/0.0 | 2/.9 |
| Drive smoothly | 1/.3 | 1/1.2 | 0/0.0 |
| Other | 26/8.4 | 4/4.9 | 22/9.6 |
| Don't know | 21/6.8 | 1/1.2 | 20/8.7 |

*"Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

*Note: Respondents were able to provide more than one response. Thus, totals sum to more than 100%.*

Table 16a

| Number of Voluntary Actions Aware Of (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| None | 20/6.4% | 5/4.0% | 14/7.5% |
| 1 | 22/7.0 | 6/4.8 | 16/8.6 |
| 2 | 129/41.1 | 50/39.7 | 79/42.2 |
| 3 | 78/24.8 | 34/27.0 | 44/23.5 |
| 4 | 36/11.5 | 16/12.7 | 20/10.7 |
| 5 or more | 29/9.2 | 15/11.9 | 14/7.5 |
| Average | 2.68 | 2.91* | 2.53* |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 16b

| Number of Voluntary Actions Aware Of (Frequency/Percent) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| None | 21/6.8% | 1/1.2% | 20/8.7% |
| 1 | 41/13.2 | 6/7.3 | 35/15.3 |
| 2 | 130/41.8 | 27/32.9 | 103/45.0 |
| 3 | 85/27.3 | 29/35.4 | 56/24.5 |
| 4 | 24/7.7 | 13/15.9 | 11/4.8 |
| 5 or more | 10/3.1 | 6/7.3 | 4/1.7 |
| Average | 2.21 | 2.87* | 1.97* |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 17

| Number of Years Respondent has been Aware of Ozone Action! Days (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| 1 | 11/3.6% | 4/3.3% | 7/3.8% |
| 2 | 30/9.7 | 6/4.9 | 24/12.9 |
| 3 | 37/12.0 | 15/12.2 | 22/11.8 |
| 4 | 23/7.4 | 15/12.2 | 8/4.3 |
| 5 | 64/20.7 | 29/23.6 | 35/18.8 |
| 6 | 14/4.5 | 7/5.7 | 7/3.8 |
| 7 (Actual number of years Ozone Action! Days have been in existence) | 11/3.6 | 4/3.3 | 7/3.8 |
| 8 | 7/2.3 | 2/1.6 | 5/2.7 |
| 9 | 2/0.6 | 1/0.8 | 1/0.5 |
| 10 | 49/15.9 | 17/13.8 | 32/17.2 |
| Over 10 | 39/12.6 | 17/13.8 | 22/11.8 |
| Don’t know | 22/7.1 | 6/4.9 | 16/8.6 |

## BEHAVIORS RELATED to OZONE ACTION! DAYS

### *Participation in Ozone Action! Days*

When respondents could name something that should be done on Ozone Action! Days, we asked them a follow-up question. Specifically, the question was, in general, how regularly did they act on their knowledge. Two-thirds (67.8%) said they engaged in voluntary actions during *most, all, or almost all* of the Ozone Action! Days (Table 18, page 39). *Very-aware* citizens were more likely to take voluntary actions during more Ozone Action! Days than *somewhat-aware* citizens (means: 1.6 vs. 2.3).

### *Reasons Citizens Do Not Participate in Ozone Action! Days*

When respondents reported that they did not always engage in an activity on a high ozone day, we asked why they were not able to participate consistently (Table 19, page 40). Frost Center callers classified these responses based on categories specified in advance. The two most common categories of responses for both groups were *not convenient* (51.9% for *very-aware* citizens and 38.6% for *somewhat-aware* citizens) and *I don't know/cannot remember* (18.5% for *very aware* and 33.3% for *somewhat aware*). Very few indicated that they *do not care about the issue* (5.6% of entire sub-sample), *do not believe that ozone is a problem* (4.3% of entire sub-sample), *do not think one person's actions make a difference* (1.9% of entire sub-sample), or *do not agree with the recommended action* (1.2% of entire sub-sample). 29.2% of the responses were categorized as *other*. These additional reasons may be found in Appendix C (page 61). The majority of people (89.3% of

entire sub-sample), regardless of awareness, gave just one response to this question (Table 20, page 40).

***Reasons Citizens Participate in Ozone Action! Days***

We asked respondents who participated in at least one Ozone Action! Day their main reasons for taking action. Citizens responded freely and callers classified each response (respondents could give more than one reason) into one of six broad categories (Table 21a, page 41). *Concerns related to the environment* were most frequently cited (65.5% of entire sub-sample). This was slightly more frequent for the *very-aware* citizens (70.2%) than the *somewhat-aware* citizens (62.2%). *Very-aware* citizens mentioned *concern for children* more often than *somewhat-aware* citizens (12.4% vs. 3.1%; statistically significant at $\underline{p}<.05$). More than one-fifth (21.5%) of responses were categorized as *other*. These additional miscellaneous reasons that did not fall under any category may be found in Appendix D (page 63).

Compared with 1998, citizens in 2001 were more likely to give responses related to *the environment* (65.5% in 2001 vs. 52.4% in 1998). This was true for both *very-aware* and *somewhat-aware* citizens (Table 21b, page 41). Citizens in 2001 were less likely to state *concerns for children* (10.6% in 2001 vs. 15.4% in 1998).

We also calculated how many reasons respondents gave for participating. About three-fourths (77.7% of entire sub-sample) of the respondents gave only one reason for taking action (Table 22a, page 42). On average, *very-aware* citizens provided

1.22 reasons, and *somewhat-aware* citizens provided 1.06 reasons. Although this difference is numerically small, it is statistically significant at $p<.05$. These means are very similar to those found in 1998 (Table 22b, page 42). Fewer people in 2001 gave no response to this question compared with 1998 (6.7% in 2001 vs. 13.5% in 1998).

### *Willingness to Participate*

There were twenty respondents who stated they were *very aware* or *somewhat aware* of Ozone Action! Days, but were not able to identify a specific action they should take on these days. We asked them how willing they would be to participate if they knew what action to take (Table 23a, page 43). Eighteen of the twenty supplied a response. Fourteen of these residents (77.7%) would be at least *somewhat willing* to participate if they knew what to do. This is higher than the 58.8% in 1998 (Table 23b, page 43).

Table 18

| Frequency of Engaging in Voluntary Actions During Ozone Action! Days During the Past Summer* (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| All or almost all Ozone Action! Days (1) | 125/43.7% | 67/55.8% | 58/34.9% |
| Most of the Ozone Action! Days (2) | 69/24.1 | 35/29.2 | 34/20.5 |
| Some of the Ozone Action! Days (3) | 55/19.2 | 12/10.0 | 43/25.9 |
| None or almost none of the Ozone Action! Days (4) | 37/12.9 | 6/5.0 | 31/18.7 |
| Average | 2.1 | 1.6** | 2.3** |

**New question for 2001 survey.*
** * "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 19

| Reasons Not Able to Comply With Voluntary Actions During All Ozone Action! Days* (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Not convenient | 72/44.7% | 28/51.9% | 44/38.6% |
| Don't care | 9/5.6 | 3/5.6 | 6/5.3 |
| Not a problem | 7/4.3 | 2/3.7 | 5/4.4 |
| One person's actions don't make a difference | 3/1.9 | 0/0.0 | 3/2.6 |
| Don't agree with it | 2/1.2 | 0/0.0 | 2/1.8 |
| Don't know/Can't remember | 48/29.8 | 10/18.5 | 38/33.3 |
| Other | 47/29.2 | 17/31.5 | 30/26.3 |

** New question for 2001 survey.*

Table 20

| Number of Reasons Given* (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| 1 | 150/89.3% | 48/88.9% | 102/89.5% |
| 2 | 16/9.5 | 6/11.1 | 10/8.8 |
| 3 | 2/1.2 | 0/0.0 | 2/1.8 |
| Average | 1.12 | 1.11 | 1.12 |

Table 21a

| Reasons for Participation in Ozone Action! Days (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Environmental-related issues | 192/65.5% | 85/70.2% | 107/62.2% |
| General health reasons | 31/10.6 | 14/11.6 | 17/5.9 |
| Concern for children | 24/8.2 | 15/12.4* | 9/3.1* |
| Health reasons related to respiratory tract | 18/6.1 | 8/6.6 | 10/3.5 |
| Avoid regulatory measures | 16/5.5 | 4/3.3 | 12/4.2 |
| Concern for elderly | 8/2.7 | 4/3.3 | 4/1.4 |
| Other reasons | 63/21.5 | 24/19.8 | 39/13.6 |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 21b

| Reasons for Participation in Ozone Action! Days (Frequency/Percent) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Environmental-related issues | 163/52.4% | 47/57.3% | 116/50.7% |
| Concern for children | 48/15.4 | 19/23.2* | 29/12.7* |
| General health reasons | 40/12.9 | 11/13.4 | 29/12.7 |
| Health reasons related to respiratory tract | 23/7.4 | 7/8.5 | 16/7.0 |
| Concern for elderly | 2/.6 | — | 2/.9 |
| Avoid regulatory measures | 1/.3 | — | 1/.4 |
| Other reasons | 74/23.8 | 21/25.6 | 53/23.1 |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*
*Note: Respondents were able to provide more than one response. Thus, totals sum to more than 100%.*

Table 22a

| Number of Reasons Provided (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| None | 21/6.7% | 5/4.0% | 15/8.0% |
| 1 | 244/77.7 | 93/73.8 | 151/80.7 |
| 2 | 39/12.4 | 23/18.3 | 16/8.6 |
| 3 | 10/3.2 | 5/4.0 | 5/2.7 |
| Average | 1.12 | 1.22* | 1.06* |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 22b

| Number of Reasons Provided (Frequency/Percent) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| None | 42/13.5% | 4/4.9% | 38/16.6% |
| 1 | 201/64.6 | 56/68.3 | 145/63.3 |
| 2 | 55/17.7 | 17/20.7 | 38/16.6 |
| 3 or more | 13/4.2 | 5/6.1 | 8/3.5 |
| Average | 1.12 | 1.28* | 1.07* |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 23a

| Willingness to Participate in Ozone Action! Days If Respondent Knew What Voluntary Actions to Take (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Very willing | 6/33.3% | 0/0.0% | 6/42.9% |
| Somewhat willing | 8/44.4 | 2/50.0 | 6/42.9 |
| Neutral | 1/5.6 | 0/0.0 | 1/7.1 |
| Somewhat unwilling | 0/0.0 | 0/0.0 | 0/0.0 |
| Very unwilling | 3/16.7 | 2/50.0 | 1/7.1 |

Table 23b

| Willingness to Participate in Ozone Action! Days If Respondent Knew What Voluntary Actions to Take (Frequency/Percent) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Very willing | 3/17.6% | — | 3/15.0% |
| Somewhat willing | 17/41.2 | 1/100.0% | 16/30.0 |
| Neutral | 1/5.9 | — | 1/5.0 |
| Somewhat unwilling | 2/11.8 | — | 2/10.0 |
| Very unwilling | 4/23.5 | — | 4/20.0 |

## SOURCES OF INFORMATION REGARDING OZONE ACTION! DAYS

### *Where Citizens Receive General Information About Ozone Action! Days*

Citizens reported they receive information about Ozone Action! Days from three main sources: *local television news* (70.0%), *local radio* (39.9%), and *local newspapers* (29.4%) (Table 24a, page 46). These frequencies did not differ as a function of being *very aware* versus *somewhat aware*. These figures are very similar to the 1998 results (Table 24b, page 46). *Television news* is clearly the most important medium for conveying information about Ozone Action! Days. The mass media in general have been the only means by which the vast majority of citizens have learned anything about ozone. Direct interpersonal communication (through *word-of-mouth*, *work*, or *display booths*) has little impact on public awareness. Some of the respondents (5.1% of entire sub-sample) gave sources that did not fit the prescribed categories. These responses are found in Appendix E (page 65).

### *How Citizens Learn it is an Ozone Action! Day*

The results of the question addressing how citizens learn a particular day is an Ozone Action! Day are similar to how they gather general information about Ozone Action! (shown in Table 24a, page 46). Citizens reported they find out that a particular day is an Ozone Action! Day from three main sources: *local television news* (62.9%), *local radio* (36.1%), and *local newspapers* (26.2%) (Table 25a, page 47). These figures are similar to the 1998 results (Table 25b, page 47). Again, the mass media are the primary sources of information for citizens, with *local television news* the single most important medium. *Very-aware* citizens were less likely this

year (2001) to mention *local television news* (64.3%) than they were in 1998 (74.4%). *Somewhat-aware* citizens were slightly more likely to mention *local television news* as a source for finding out it is an Ozone Action! Day in 2001 (62.0%) than in 1998 (56.8%).

***When Citizens Learned it was an Ozone Action! Day***

The majority of citizens found out it was an Ozone Action! Day *during the morning* (67.2%; Table 26a, page 48). Another 28.1% find out the *evening before*. Only 4.7% learn of the Ozone Action! Day designation *later that evening*. Most citizens find out early enough to take action on these days. Similar results were found in 1998 (Table 26b, page 48).

Table 24a

## Where Respondents Receive Information About Ozone Action! Days (Frequency/Percent) 2001 Results

| | Total | Very Aware | Somewhat Aware |
|---|---|---|---|
| Local television news | 219/70.0% | 86/68.3% | 133/71.1% |
| Local radio | 125/39.9 | 47/37.9 | 78/41.7 |
| Local newspapers | 92/29.4 | 38/30.2 | 54/28.9 |
| School | 9/2.9 | 5/4.0 | 4/2.1 |
| Work | 8/2.6 | 4/3.2 | 4/2.1 |
| Word of mouth | 7/2.2 | 4/3.2 | 3/1.6 |
| Public service announcements | 3/1.0 | 3/2.4* | 0/0.0* |
| West Michigan Clean Air Coalition website | 1/0.3 | 1/0.8 | 0/0.0 |
| Display booth | 0/0.0 | 0/0.0 | 0/0.0 |
| Telephone hotline | 0/0.0 | 0/0.0 | 0/0.0 |
| Other | 16/5.1 | 9/7.1 | 7/3.7 |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 24b

## Where Respondents Receive Information About Ozone Action! Days (Frequency/Percent) 1998 Results

| | Total | Very Aware | Somewhat Aware |
|---|---|---|---|
| Local television news | 205/65.9% | 59/72.0% | 146/63.8% |
| Local radio | 115/37.0 | 30/36.6 | 85/37.1 |
| Local newspapers | 106/34.1 | 32/39.0 | 74/32.3 |
| School | 18/5.8 | 9/11.0* | 9/3.9* |
| Word of mouth | 11/3.5 | 3/3.7 | 8/3.5 |
| Work | 7/2.3 | 1/1.2 | 6/2.6 |
| Public service announcements | 5/1.6 | 1/1.2 | 4/1.7 |
| Display booth | 1/.3 | — | 1/.4 |
| Other | 20/6.4 | 8/9.8 | 12/5.2 |

*Note: Respondents were able to provide more than one response. Thus, totals sum to more than 100%.*

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*

Table 25a

| Where Respondents Find Out it is an Ozone Action! Day (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Local television news | 197/62.9% | 81/64.3% | 116/62.0% |
| Local newspapers | 113/36.1 | 46/36.5 | 67/35.8 |
| Local radio | 82/26.2 | 32/25.4 | 50/26.7 |
| Word of mouth | 29/9.3 | 11/8.7 | 18/9.6 |
| Internet | 5/2.0 | 2/1.6 | 3/1.6 |
| Work | 3/1.0 | 1/0.8 | 2/1.1 |
| Telephone hotline | 4/1.3 | 2/1.6 | 2/1.1 |

Table 25b

| Where Respondents Find Out it is an Ozone Action! Day (Frequency/Percent) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Local television news | 191/61.4% | 61/74.4%* | 130/56.8%* |
| Local radio | 123/40.0 | 39/47.6 | 84/36.7 |
| Local newspapers | 93/29.9 | 22/26.8 | 71/31.0 |
| Word of mouth | 9/2.9 | 3/3.7 | 6/2.6 |
| Work | 5/1.6 | 2/2.4 | 3/1.3 |
| Telephone hotline | 1/.3 | — | 1/.4 |
| Internet | 1/.3 | 1/1.2 | — |
| Other | 17/5.5 | 3/3.7 | 14/6.1 |

** "Very Aware" group statistically significantly different from "Somewhat Aware" group at the p<.05 level.*
*Note: Respondents were able to provide more than one response. Thus, totals sum to more than 100%.*

Table 26a

| When Respondents Find Out it is an Ozone Action! Day (Frequency/Percent) 2001 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Day before | 84/28.1% | 35/28.5% | 49/27.8% |
| Morning of | 201/67.2 | 83/67.5 | 118/67.0 |
| Evening of | 14/4.7 | 5/4.1 | 9/5.1 |

Table 26b

| When Respondents Find Out it is an Ozone Action! Day (Frequency/Percent) 1998 Results | | | |
|---|---|---|---|
| | **Total** | **Very Aware** | **Somewhat Aware** |
| Day before | 87/28.0% | 23/28.0% | 64/27.9% |
| Morning of | 172/55.3 | 48/58.5 | 124/54.1 |
| Evening of | 20/6.4 | 3/3.7 | 17/7.4 |

## ALL CITIZENS SURVEYED

### *Perceptions of Air Pollution and Ground-Level Ozone Problems*

We asked all respondents, including those who stated they were *not at all aware* of Ozone Action! Days, how much of a problem they think air pollution is in their community (Tables 27a and 27b, page 51). Overall, 61.2% of the citizens reported air pollution is a *minor problem*, 22.0% reported it is a *major problem*, and 16.8% reported it is *not a problem*. If citizens were at least *somewhat aware* of Ozone Action! Days, they were more likely to perceive air pollution as a problem in their community (statistically significant at $p<.05$). *Very-aware* respondents were less likely to think air pollution was a *major problem* in 2001 (22.1%) compared with 1998 (32.9%) These respondents were more likely, in turn, to view it as a *minor problem* in 2001 (66.4%) than in 1998 (56.1%).

Respondents also were also asked how much of a problem they think ground-level ozone is in their community. Overall, 57.2% of the citizens think ground-level ozone is a *minor problem*, 22.1% think it is a *major problem*, and 20.7% think it is *not a problem* (Tables 28a and 28b, page 52). Citizens who reported they were *very aware* of Ozone Action! Days were more likely to think ground-level ozone is a *major problem* compared with those who are *not at all aware* of Ozone Action! Days (ANOVA statistically significant at $p<.05$). This calculation was made by assigning a numeric value of '1' to *major problem*, '2' to *minor problem*, and '3' to *not a problem*. Thus a lower number indicates greater agreement that this is a *major problem*. Even though the percentage of respondents believing ground-level ozone is a *major*

*problem* does not differ between *very-aware* and *somewhat-aware* residents, and differs very little from *not-at-all-aware* residents, the difference is still statistically significant because of a small number of *very-aware* residents (13.5%) indicating it was *not at all a problem*. *Very-aware* respondents were less likely to think ground-level ozone was a *major problem* in 2001 (22.9%) compared with 1998 (28.0%). These residents were more likely to see it as a *minor problem* in 2001 (63.5%) than in 1998 (43.9%). *Somewhat-aware* respondents were more likely to think ground-level ozone was slightly less of a problem in 2001 (22.8%) compared with 1998 (16.6%). The largest change occurred for those who reported they were *not aware* of Ozone Action! Days. Specifically, *not-at-all-aware* respondents were more likely to think ground-level ozone was a *major problem* in 2001 (19.0%) compared with 1998 (2.9%).

Residents' perceptions of air pollution in their community and ground-level ozone do not differ significantly based on the county in which they live. The highest percentage of residents believing air pollution is a *major problem* was from Muskegon County (28.3%), although this finding is not significant (Table 29a, page 53). Kent County had the highest percentage of residents indicating ground-level ozone is a *major problem* (24.8%), but again this finding is not significant (Table 30a, page 54).

Table 27a

| Respondents' Perception of Air Pollution Problem in Their Community (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Row Means** |
| Major problem (1) | 84/22.0% | 27/22.1% | 45/25.3% | 12/15.0% | 1.8 |
| Minor problem (2) | 233/61.2 | 81/66.4 | 110/61.8 | 41/51.3 | 1.8 |
| Not a problem (3) | 64/16.8 | 14/11.5 | 23/12.9 | 27/33.8 | 2.2 |
| Column Mean/Freq/% | | 1.9/122/32.1 | 1.9/178/46.8 | 2.2/80/21.1 | |

Table 27b

| Respondents' Perception of Air Pollution Problem in Their Community (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Row Means** |
| Major problem (1) | 95/24.2% | 27/32.9% | 48/21.8% | 20/22.0% | 1.9 |
| Minor problem (2) | 242/61.6 | 46/56.1 | 151/68.6 | 45/49.5 | 2.0 |
| Not a problem (3) | 56/14.2 | 9/11.0 | 21/9.5 | 26/28.6 | 2.3 |
| Column Mean/Freq/% | | 1.8/82/19.8 | 1.9/220/53.1 | 2.1/91/22.0 | |

Table 28a

| Respondents' Perception of Ground-Level Ozone Problem in Their Community (Frequency/Percent) 2001 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Row Means** |
| Major problem (1) | 64/22.1% | 22/22.9% | 31/22.8% | 11/19.0% | 1.8 |
| Minor problem (2) | 166/57.2 | 61/63.5 | 79/58.1 | 26/44.8 | 1.8 |
| Not a problem (3) | 60/20.7 | 13/13.5 | 26/19.1 | 21/36.2 | 2.1 |
| Column Mean/Freq/% | | 1.9/96/33.1 | 2.0/136/46.9 | 2.2/58/20.0 | |

Table 28b

| Respondents' Perception of Ground-Level Ozone Problem in Their Community (Frequency/Percent) 1998 Results | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Very Aware (1)** | **Somewhat Aware (2)** | **Not at All Aware (3)** | **Row Means** |
| Major problem (1) | 64/18.6% | 23/32.9% | 38/19.0% | 3/4.1% | 1.7 |
| Minor problem (2) | 188/54.7 | 36/51.4 | 121/60.5 | 31/41.9 | 2.0 |
| Not a problem (3) | 92/26.7 | 11/15.7 | 41/20.5 | 40/54.1 | 2.3 |
| Column Mean/Freq/% | | 1.8/70/16.9 | 2.0/200/48.3 | 2.5/74/17.9 | |

Table 29a

| Respondents' Perception of Air Pollution Problem in Their Community, by County (Frequency/Percent) 2001 Results | | | | |
|---|---|---|---|---|
| | **Total** | **Kent County** | **Muskegon County** | **Ottawa County** |
| Major problem (1) | 84/22.0% | 48/21.6% | 15/28.3% | 21/19.8% |
| Minor problem (2) | 233/61.2 | 136/61.3 | 33/62.3 | 64/60.4 |
| Not a problem (3) | 64/16.8 | 38/17.1 | 5/9.4 | 21/19.8 |
| Column Mean/Freq/% | | 2.0/222/58.3 | 1.8/53/13.9 | 2.0/106/27.8 |

Table 29b

| Respondents' Perception of Air Pollution Problem in Their Community, by County (Frequency/Percent) 1998 Results | | | | |
|---|---|---|---|---|
| | **Total** | **Kent County** | **Muskegon County** | **Ottawa County** |
| Major problem (1) | 95/24.2% | 53/24.0% | 29/35.8% | 13/13.8% |
| Minor problem (2) | 242/61.6 | 137/62.0 | 40/49.4 | 65/69.1 |
| Not a problem (3) | 56/14.2 | 31/14.0 | 12/14.8 | 13/13.8 |
| Column Mean/Freq/% | | 1.9/221/53.4 | 1.8/81/19.6 | 2.0/91/22.0 |

Table 30a

| Respondents' Perception of Ground-Level Ozone Problem in Their Community, by County (Frequency/Percent) 2001 Results | | | | |
|---|---|---|---|---|
| | **Total** | **Kent County** | **Muskegon County** | **Ottawa County** |
| Major problem (1) | 64/22.1% | 41/24.8% | 7/18.9% | 16/18.2% |
| Minor problem (2) | 166/57.2 | 94/57.0 | 23/62.2 | 49/55.7 |
| Not a problem (3) | 60/20.7 | 30/18.2 | 7/18.9 | 23/26.1 |
| Column Mean/Freq/% | | 1.9/165/56.9 | 2.0/37/12.8 | 2.1/88/30.3 |

Table 30b

| Respondents' Perception of Ground-Level Ozone Problem in Their Community, by County (Frequency/Percent) 1998 Results | | | | |
|---|---|---|---|---|
| | **Total** | **Kent County** | **Muskegon County** | **Ottawa County** |
| Major problem (1) | 64/18.6% | 43/20.9% | 13/21.3% | 8/8.5% |
| Minor problem (2) | 188/54.7 | 114/55.3 | 30/49.2 | 44/46.8 |
| Not a problem (3) | 92/26.7 | 49/23.8 | 18/29.5 | 25/26.6 |
| Column Mean/Freq/% | | 2.0/206/49.8 | 2.1/61/14.7 | 2.2/77/18.6 |

## PROFILES OF CITIZENS BY DIFFERENT LEVELS OF AWARENESS

The following profiles were developed to provide general characterization of residents' self-ratings at the highest and lowest levels of awareness—*very aware* and *not at all aware*. The main purpose of developing these profiles was to describe citizens who currently have some awareness of Ozone Action! Days, and to identify citizens who are more likely to be unaware of Ozone Action! Days.

*Very Aware* Citizens:

- More likely to be 35-54 years old (47.2%)
- More likely to be female (68.3% of these citizens were female, compared to 61.5% of the total sample)

*Not at All Aware* Citizens:

- More likely to be 18-24 or 65 years and over (41.3%)
- More likely to be high school/GED grad or less (56.0%)
- More likely to be male (46.5% of these citizens were male, compared to 38.5% of the total sample).

## CONCLUSIONS

### *Awareness of Ozone Action! Days*

There are a number of factors related to citizens' awareness of Ozone Action! Days. Citizens under the age of 25 and those over the age of 65 are more likely to report that they are *not at all aware*. Men are more likely to be *not at all aware* of Ozone Action! Days. Though a large percentage of the sample was at least *somewhat aware* of Ozone Action! Days, most only remember 2-6 of the 12 Ozone Action! Days from the past season. Very few remembered anywhere near twelve days. Of course, this could be a difficulty in memory, but it raises the strong possibility that even aware citizens only know of one-fourth to one-half of all Ozone Action! Days.

### *Knowledge of Actions to Take*

Most aware citizens can name 2-3 things they should do on Ozone Action! Days; most frequently *don't mow the lawn* and *don't fill gas tank*. Since the majority of citizens know these two items, it would be interesting to investigate if these still are the two actions stressed most often by those informing the public of Ozone Action! Days.

Some message is getting through to the public. Greater awareness is related to modest increase in knowledge. There were modest differences in the knowledge bases of *very-aware* and *somewhat-aware* citizens. Citizens know they should take specific actions on Ozone Action! Days, but the reasons why they should act are not always known.

### *Motivations for Taking Action*

When citizens were asked why they participate in Ozone Action! Days, the most common responses were *concerns for the environment*. The next most common responses were reasons related to *health issues*. These concerns were similar to what we saw in 1998.

### *Information Channels*

Mass media clearly does the most in informing citizens about Ozone Action! Days. Most citizens know about Ozone Action! Days from *television news programs*, *newspapers*, and *radio*.

### *Differences Between 1998 Results and 2001 Results*

We highlight the notable differences between the 1998 and 2001 evaluations of the Ozone Action! Days program.

- There was an increase in recognition of all four components of the definition of calling an Ozone Action! Day (Tables 12a and 12b).
- A smaller percentage of the people could not generate any reasons when an Ozone Action! Day would be called. In 1998, 58.5% could not generate any reasons compared to 39.3% in 2001 (Tables 13a and 13b).
- There was an increase in the average number of voluntary actions of which citizens were aware (2.68 in 2001 vs. 2.21 in 1998; Tables 16a and 16b).
- The most frequent reason for voluntary participation in both 1998 and 2001 was an environmental-related issue. Despite being the most frequent reason in 1998 (52.4%), it still showed an increase in 2001 (65.5%; Tables 21a and 21b).

- Among those who reported they were both very aware/somewhat aware *and* reported they did not know what voluntary actions to take, the percentage of citizens reporting they were “very willing” to take action rose from 17.6% in 1998 to 33.3% in 2001. Although this increase is notable in percentage terms, caution is urged in interpreting it because the sample size in both cases is small. (Smaller sample sizes tend to produce less reliable estimates.)

# Appendix A

**In your own words, what is an Ozone Action! Day? (other: specify)**

**Very Aware Citizens**

- A day when you conserve energy
- A time to be more cautious
- Awareness of air quality and what we can do about it
- High humidity
- Save the ozone layer
- The temperature gets to a certain degree, hangs low, and the humidity gets to about 70
- The temperature gets very high
- There are things in the atmosphere that make things worse than the green-house effect
- Try to backpedal what we did in the 60's, and try to decrease the ozone hole. It deals with the environment.
- When you do not use any hazardous equipment

**Somewhat Aware Citizens**

- A day for people to be aware of the depleting ozone layer (2)
- A day when you are not supposed to pump gas or use your mower
- A day when you should not gas your car or use things that would put stuff into the air
- A day where we try to respect the ozone more than we do every other day
- A warm day
- Asking people to be aware of the atmosphere
- Be safe to the atmosphere
- Damage the ozone
- Days when you cannot breathe
- Days where you have to be careful not to harm the ozone
- High incidence of fog
- Limit engine emissions
- Oxygen level is depleted in the air
- Reminder of machinery and lawn mowers
- The air is too thick to absorb fumes
- Too much of something in the air
- Trying to conserve on polluting the air
- When ozone levels are contusive and are unsafe
- When humidity and heat reach index

# Appendix B

The West Michigan Clean Air coalition suggests a number of voluntary actions citizens can take on Ozone Action! Days. Please tell me which actions you are familiar with. (other: specify)

Very Aware Citizens

- **Air conditioner limited**
- **Do not drive**
- **Do not drive if you do not have to**
- **Do not drive too much**
- **Do not use air conditioner**
- **Do not work or exercise outside**
- **Do dishes in creek outside**
- **Drive less**
- **Leaving sprinklers off and driving at night**
- **Limit driving**
- **No burning**
- **No burning of wood**
- **No car use**
- **Not to burn any oil**
- **Stay inside**
- **Walk, take your motor cycle, not car**

**Somewhat Aware Citizens**

- Anything that pollutes the air
- Do not drive
- **Do not idle car**
- Do not use equipment with exhaust
- Drive after sunset
- Elderly stay inside
- Keep fans going, keep door shut, and stay inside
- No burning fires
- Stay inside and drive as little as possible
- Stay inside as much as possible
- Unnecessary driving

# Appendix C

What are the primary reasons you or people you know were not able to take voluntary actions during all of the Ozone Action! Days? (other: specify)

Very Aware Citizens

- A necessity
- Because of work, I need to drive to work and machinery
- Busy
- Cannot avoid everyday actions
- **Did not absolutely have any time, emergency situations**
- Do not know about action days
- Does not do the things that affect the air
- Due to work
- I cut lawn on the day
- I do not believe it; people are scientific enough to determine it.
- Necessity of gas
- Necessity to do things
- Needed gas in car to get places
- People think since living in the country, it is not important
- People use the environment as an image, they do not want that image
- Personal choice
- Would have run out of gas

**Somewhat Aware Citizens**

- Personal schedule (2)
- Commute to work, not being able to carpool
- Did not feel like it
- Did not know about them
- Did not really think about it, I hadn't kept track of them very well
- Do not do anything that harms the atmosphere, at least not much
- Has a disease and cannot go outside
- I did not know what days they were and not knowing what was asked
- I do not always hear about when they are happening
- I had no gas
- I live in a condo and cannot say when the lawn is mowed
- I live in the country and it is hard not to drive my car
- I was not aware of it
- Inability to carpool, or vehicle on empty-those are the ones I know of
- Matter of necessity

- More pollution goes into the air in one volcano explosion than by anything we could ever put into it
- Need car for transportation
- Normal living pattern
- Not always convinced that we need to, major inconvenience
- Not being aware
- Not possible for work
- Ozone layers is too hyped
- 75% of pollution comes from Chicago area so why should we take action
- They chose not to, we do not talk about that
- Time
- Unable to participate due to complicated reasons
- Was not aware of any
- Work obligations

# Appendix D

There are a number of reasons why citizens participate in Ozone Action! Days. What are your main reasons for taking action? (other: specify)

Very Aware Citizens

- Because you are not supposed to. Craig James told us not to, that' s why (laughs).
- Common sense, we are all polluting and every little bit of help is good
- Did not participate
- Everyone has to care a little bit
- Good citizen
- Has to work 12 hours, too hot to do anything
- I did not take any (action)
- Just because
- Just because it was convenient
- Lazy, did not want to mow the lawn
- Makes sense
- No reason, it just works out that way
- One more person helps, it makes a difference
- Protect the environment
- Right thing to do
- So many people ignore it, so I have got to do it
- So we do not have to have ozone action days
- This summer it was coincidence, we did not need to do any of those things anyway
- To avoid making things worse
- To help out
- To help the air stay cleaner
- Trust they are put in place for good reasons

**Somewhat Aware Citizens**

- Just because (2)
- Better citizen
- Care about the earth
- Convenient – why not
- Courtesy
- Did not take any
- Do not care
- Everyone should do their part
- For the future kids

- Guilt. (laughs silently). I feel guilty if I do not help out
- He does not participate at all
- I do it when it is convenient
- I do not
- I do not mow my law because I live in an apartment, and I rarely fill my gas tank anyway, so it was easy for me to simply participate
- I have been in cities with horrible air, and I do not want this area to be like that
- I just did it, it seemed right
- I'm blind, so I do not have a car or lawn mower, but I know a little about ozone
- It is easy to do
- It is easy to do something for it
- Just the right thing to do
- Kids will one day be old enough to realize I did not help
- My wife reminds me to, and so I comply, but if not major inconvenience
- Not on purpose
- Sense of responsibility
- She does what she is told
- The right thing to do
- To be p.c.
- To help out, I guess
- Too hot
- Too hot to be outside anyway
- Trying to be a good citizen
- Uncomfortable
- Want to abide by laws
- We have to live in this world
- When it is ozone action day, it is too hot to do anything

# Appendix E

Where have you received information about Ozone Action! Days? (other: specify)

Very Aware Citizens

- The internet (3)
- Brochures
- Computer
- In the mail
- My husband is an environmentalist
- Newspapers from conservation groups
- People from California

**Somewhat Aware Citizens**

- A book
- College
- Common sense
- None
- Radio and news when I was in Colorado
- The internet