

Data Analysis Project: Leaf Burning Effects
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Prepared For

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In an effort to assess the effect of leaf burning on asthma sufferers in St. Clair and Madison Counties, a survey was developed in conjunction with the American Lung Association of Illinois for use during Fall 1998, the prime leaf and yard waste burning period of the year. This survey was provided to several local hospitals and to the offices of two physicians specializing in allergy treatment. The survey was distributed to patients seeking health care for breathing related difficulties and completed surveys were obtained from a total of 277 individuals, most of the respondents were from St. Clair County. The surveys were completed between October 10, 1998 and December 15, 1998.

Participants in the survey study were drawn from individuals seeking treatment at both hospital emergency rooms and physician's offices. Of these, 92 or 33.2 percent were from St. Elizabeth's Hospital, Belleville and 144 or 52 percent were from participating physicians in Belleville (Dr. James Corry and Dr. William Johnson). The remaining 41 individuals, or 14.8 percent, were from other hospitals in the Metro East area (Wood River Hospital, St. Anthony's Health Center, Alton Memorial Hospital and St. Joseph's Hospital in Highland).

A large majority of the participants in the survey reported having asthma, some 78 percent responding that they had asthma.

Summary of Findings

Exposure to Leaf Burning and Risk of an Asthma Episode

This study found a pronounced relationship between asthma episodes and exposure to burning yard waste. Data from this study indicated that individuals exposed to burning yard waste had a 3.1 times greater risk of experiencing an asthma episode than an individual who was not exposed to leaf burning. These findings are consistent with those of a similar study conducted in 1997 for the American Lung Association for this same geographic area. In that study the risk of experiencing an asthma episode was found to be about 3.4 times greater for an individual exposed to leaf burning than for individuals not exposed to leaf burning. Given the fact that these findings were based on sample data, the relative risk may have been over or under estimated. At the 95% confidence level, this risk may be as low as about 2 times as great, or as high as 6 times as great.

Participants sought health care for breathing difficulties as well as for severe asthma episodes. Not all of the patients were experiences an actual asthma attack.

The results of the survey do clearly indicate that exposure to leaf burning has negative health effects for individuals suffering from asthma.

Air Quality (Leaf Smoke) and Need to Seek Health Care

Of the participants reporting on air quality of the day they sought medical treatment, 57 percent indicated that leaf smoke was in the air. This is an indication that even when leaf smoke does not produce an actual asthma episode, exposure may create the need for medical intervention for asthma patients.

Proximity to Leaf Burning

Proximity to leaf burning was a factor for patients reporting asthma problems. Of the patients reporting exposure to leaf burning, 64 percent were exposed to leaf burning within one block of their place of residence, 18 percent were exposed to leaf burning within two to four blocks of their place of residence, and 9 percent were exposed to leaf burning within five to ten blocks of their place of residence. The remaining 9 percent reported being exposed to leaf burning from distances of greater than 10 blocks.

This finding indicates that participants experienced health problems from neighbors burning leaves, both near to their place of residence as well as from some distance from their place of residence. The negative health effects of leaf burning may extend beyond the immediate neighborhood in which the leaf burning occurred.

Latent Response Between Asthma and Time of Exposure to Leaf Burning

A pronounced latent response pattern was observed between the need to seek medical care and exposure to leaf burning. Of those reporting exposure to leaf burning, some 35 percent sought health care within one hour of exposure. Some 9 percent sought medical care after 1 to 2 hours of exposure, some 24 percent sought medical care after 3 or 4 hours of exposure and some 32 percent sought medical care after 5 or more hours of exposure to leaf burning.

Exposure to leaf burning may produce an immediate need to seek health care or the need to seek health care may be delayed for some five or more hours. This indicates that individuals exposed to leaf burning may have a latent response and need to seek health care after a neighbor has stopped burning leaves.

Need for Follow-Up Health Care

Of the participants exposed to leaf burning, 76 percent were advised of their need to schedule follow-up visits for their asthma conditions. This indicates that medical care for asthma patients involves more than a single visit with a health care provider to deal with the effects of an episode involving breathing difficulties. Exposure to leaf burning imposes financial and health costs on individuals with asthma.

Smoking Incidence

There was a very low incidence of smoking for participants in this survey. Slightly over 90 percent of the participants indicated that they did not smoke.

Financial Costs of Providing Medical Treatment for Asthma Episodes

Data were also obtained from hospitals in the St. Clair region relating to the costs of treating an asthma episode in patients.

In order to determine the financial costs for treating an asthma episode, data were obtained for 153 individuals requiring hospital treatment related to asthma in 1998. Individuals ranged in age from infant to senior citizen, the average reflects the cost across age categories. The average was found to be \$1,031 to treat an asthma episode.

This means that if an individual burns leaves and that activity causes an asthma episode, either the patient, the insurance company or the Medicaid system, will incur a significant financial cost. For every 100 individuals experiencing an asthma episode the financial cost would be in excess of \$100,000.

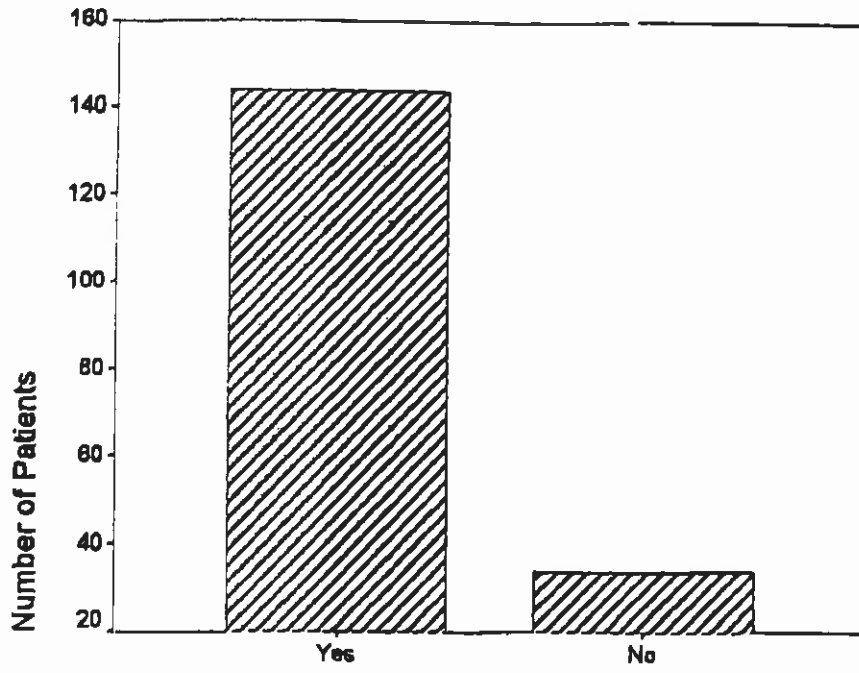
Leaf burning should not be viewed as a fiscally neutral activity. It has the potential for a significant impact on the costs of health care.

Conclusions

Leaf burning should be evaluated in the context of its impact on public health.

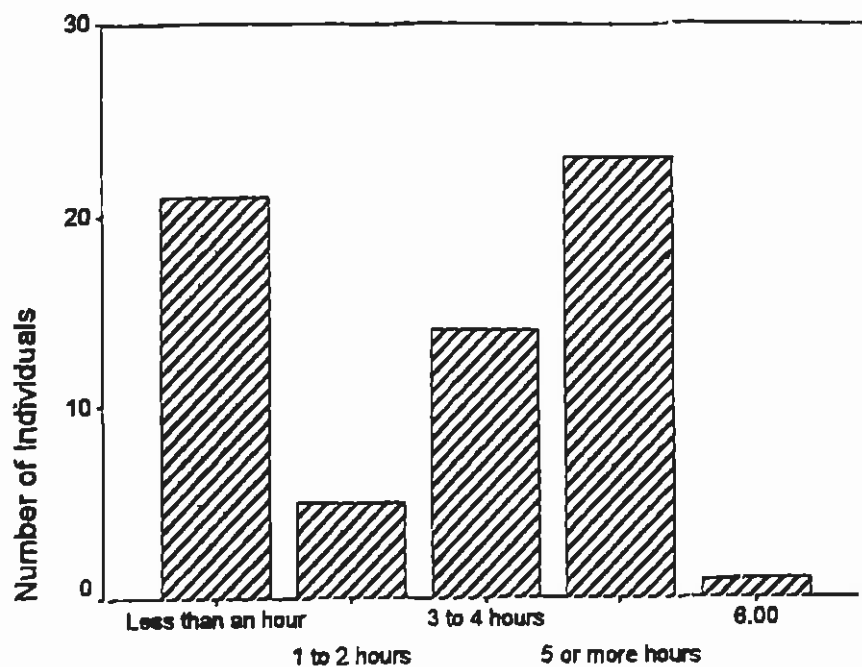
- Individuals exposed to leaf burning have a significantly greater risk of experience an asthma episode,
- Proximity to leaf burning has an impact on the incidence of asthma episodes
- An immediate as well as a latent response exists between exposure to leaf burning and an asthma episode
- Treatment of asthma episodes related to leaf burning requires more than one visit to a health care provider
- Leaf burning is not without significant financial costs, the cost of treating a single individual for an asthma episode averages \$1,031. When this figure is multiplied by the total number of asthma episodes related to leaf burning, the true financial costs associated with leaf burning become evident. For every 100 individuals experiencing an asthma episode, the cost of treatment will be in excess of \$100,000.

Patient Instructed to Schedule Follow-Up Visit?



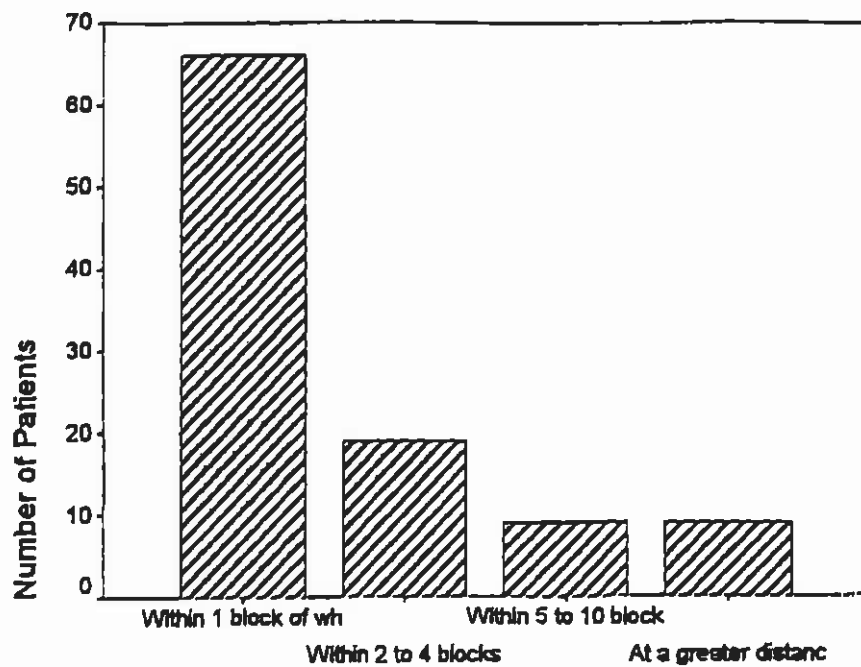
Has the patient been advised of the need for a follow-up visit

Length of Time from Exposure to Leaf Burning to Visit with Physician or Hospital



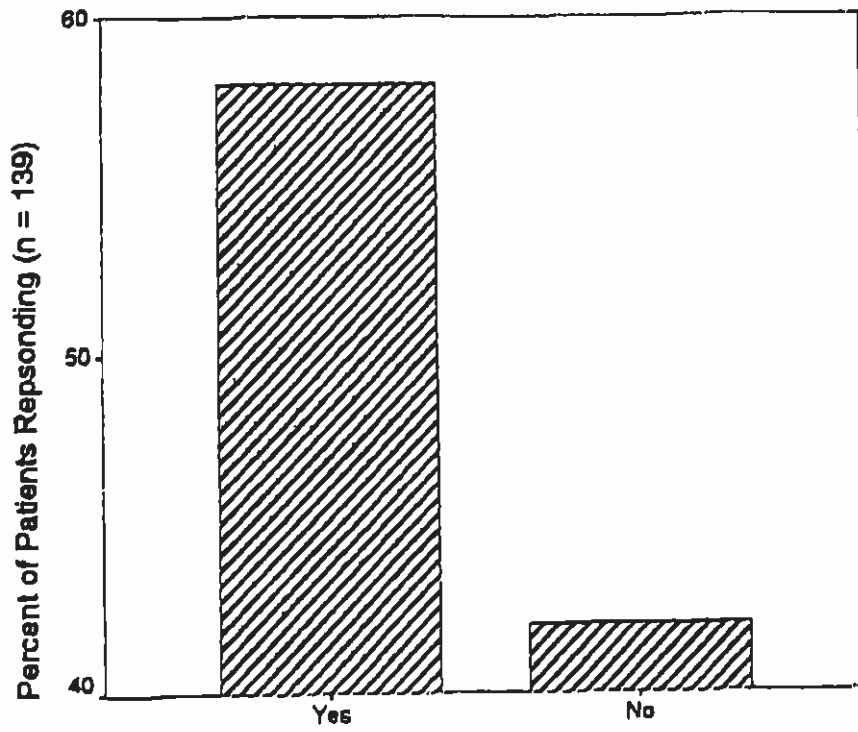
Length of Time from Exposure to Medical Visit

Distance From Burning Leaves or Yard Waste

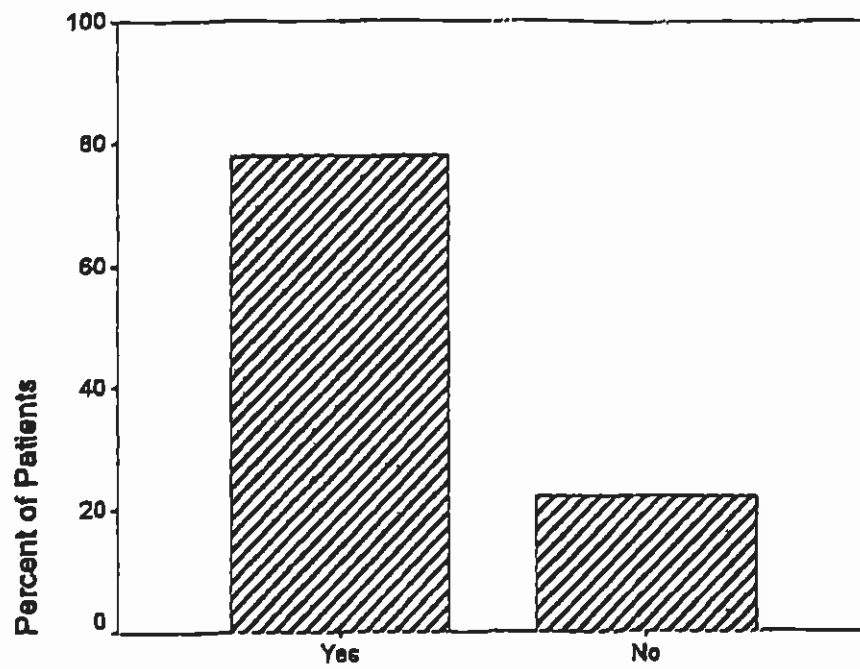


Distance From Burning Leaves or Yard Waste

Smoke Present In Air Prior to Visit for Medical Care?



Does the Patient Have Asthma?



Does the Patient Have Asthma?

Date Survey Completed

