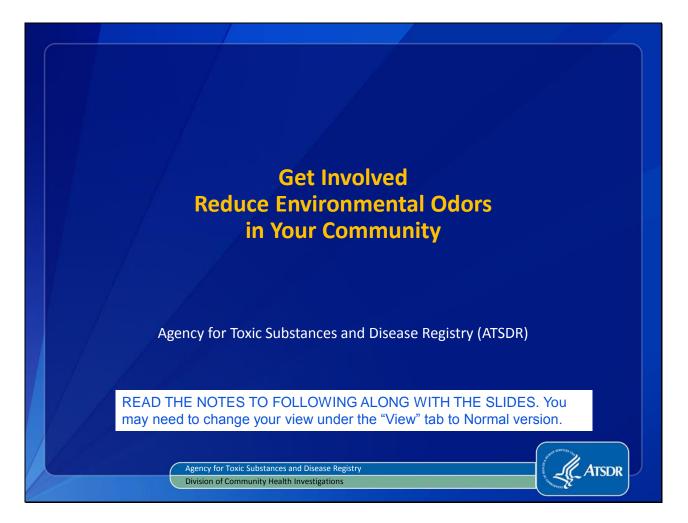
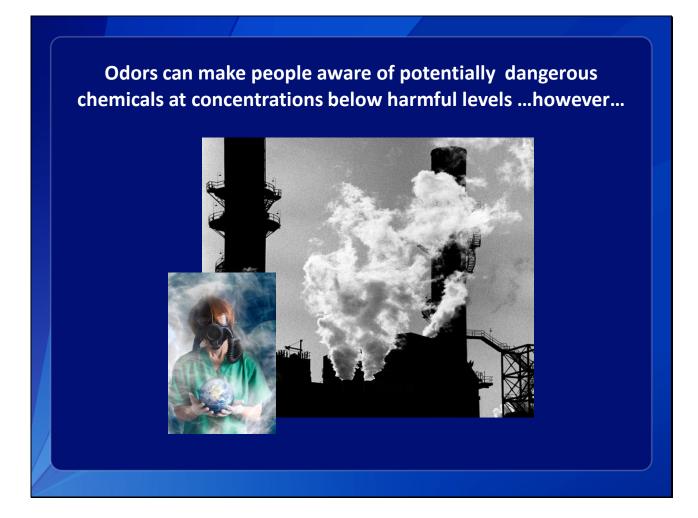
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Slide 1
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READ THE NOTES TO FOLLOWING ALONG WITH THE SLIDES. You may need to change your view under the "View" tab to Normal version.

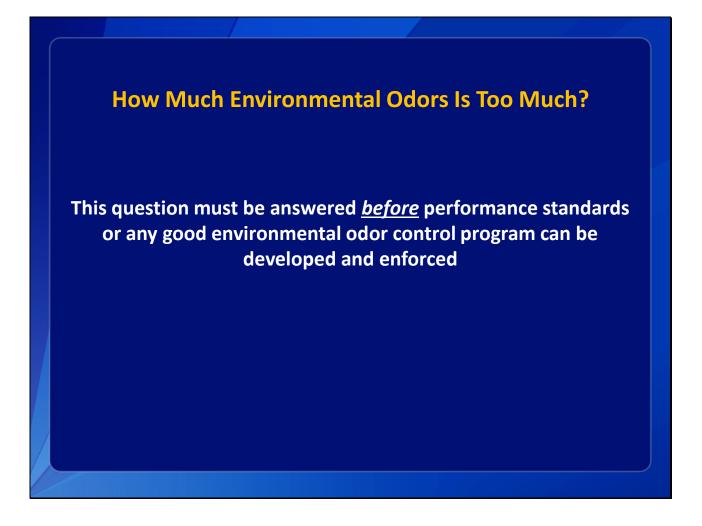




People can sometimes smell chemicals in the air before they are at harmful levels. Community members feel that their quality of life and sense of wellbeing are diminished because of the odors.

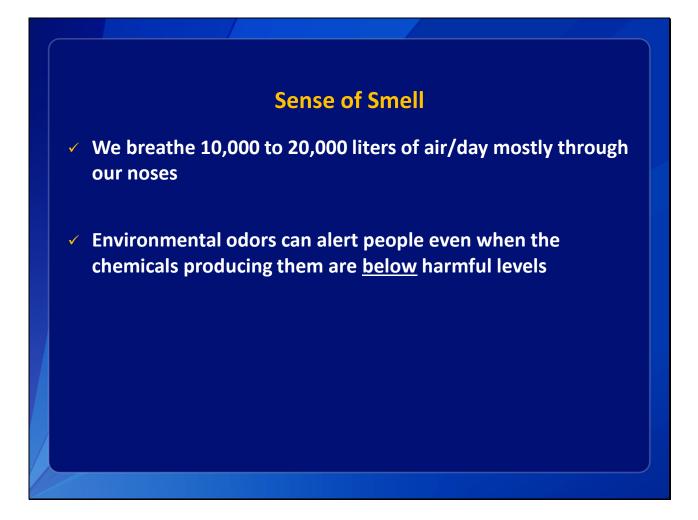
ATSDR continues to receive concerns from community members requesting an evaluation of environmental odors coming from an industry near their community. The community concerns tend to be of common health symptoms such as

- -headaches
- -nasal congestion
- -dizziness and
- -watery eyes









You can smell many chemicals (the odor threshold) **<u>before</u>** they are at harmful levels as is the case of **Hydrogen Sulfide**.

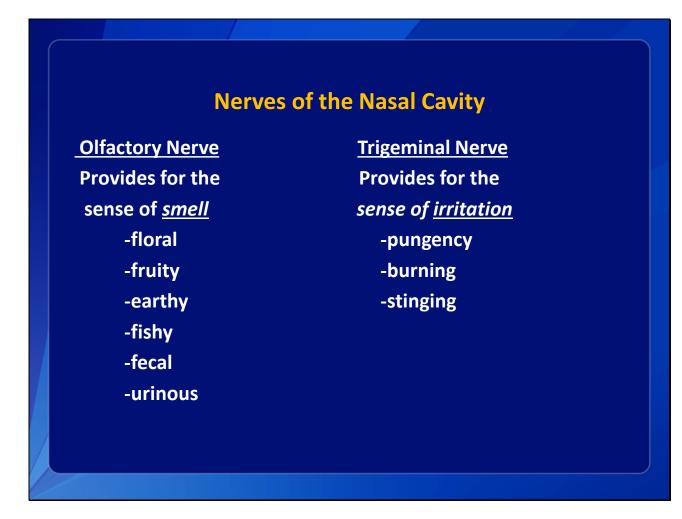
Hydrogen Sulfide (H<sub>2</sub>S)

Odor threshold  $\rightarrow$  0.5 – 30 parts per billion (pp<u>b</u>)

Irritation threshold  $\rightarrow$  10 – 20 parts per million (ppm) -a thousand times more.

Olfactory Fatigue (where you can no longer use your sense of smell) → 100 ppm

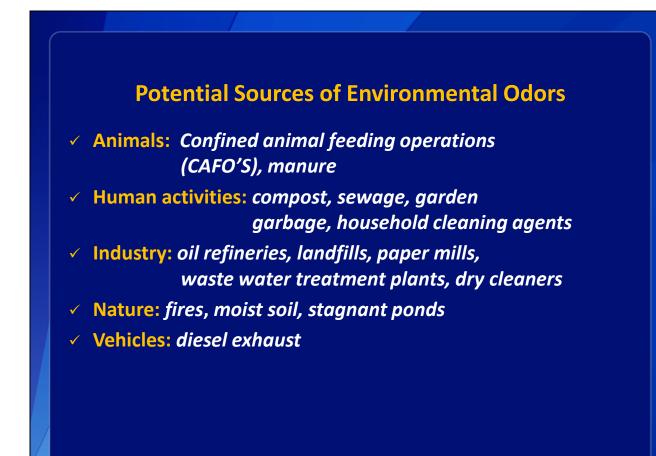
Loss of Consciousness (LOC): 750 – 1,000 ppm \*\*Knockdown! Or Collapse [Sullivan and Krieger 2001] paralysis of the respiratory center [Dalton 1999] and death! (likely a consequence of *direct* toxic action of H<sub>2</sub>S in the brain) [Sullivan and Krieger 2001].

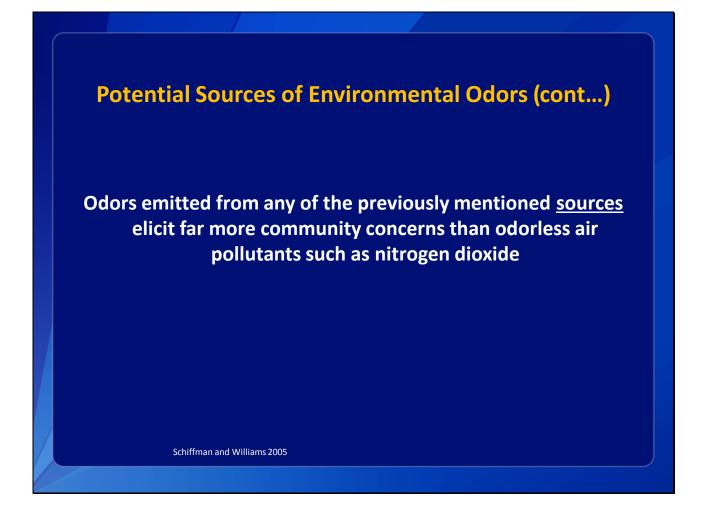


# The olfactory and the trigeminal nerves inform us of the <u>chemical quality of the air we</u> <u>breathe</u>

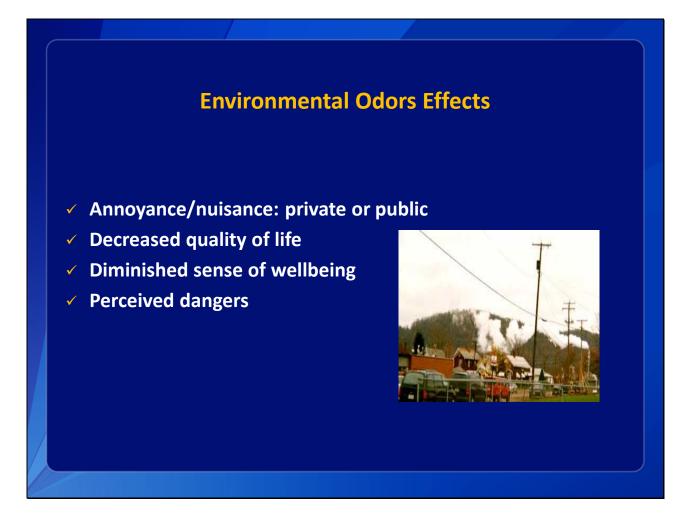
Olfactory Nerve  $\rightarrow$  provides for the sense of smell Trigeminal Nerve  $\rightarrow$  provides for the sense of irritation







Some individuals attribute health symptoms to odor exposures, even when no symptoms would be expected because the odor level of the substance in air is so small. Bulsing et al. 2009.



## Annoyance or Nuisance can be private or public:

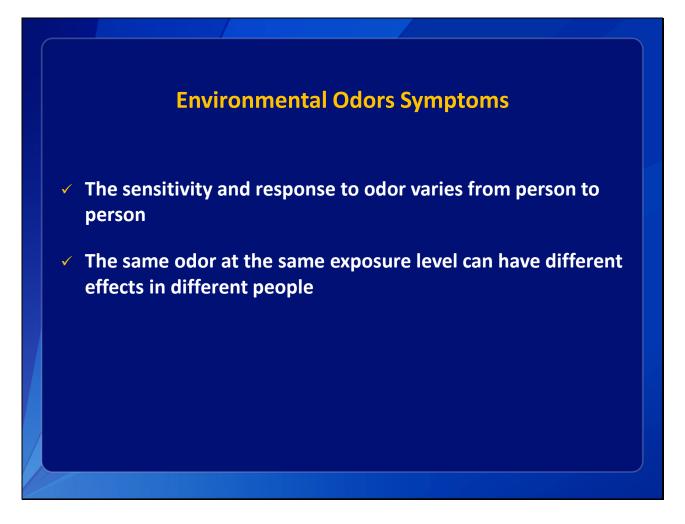
**Private nuisance**: Activity, situation, or conduct of another person that annoys you or inconveniences you or your family. It is also an activity, situation, or conduct that interferes with the enjoyment, health, or safety of your land, home or building.

**Public nuisance**: Activity, situation, or conduct of another person that interferes or affects the comfort, health, or safety of the public.

Decreased quality of life: When the enjoyment of all that life has to offer is reduced.

Diminished sense of wellbeing: When the feeling that life is going well is decreased or lost.

**Perceived dangers:** To become aware of something through the senses. You may "have the sense" that *something is wrong...* for some people odors may be an environmental cue similar to the sound of a machine or the sight of smoke.



Some people when "worried" about an environmental odor feel sicker and tend to report those symptoms.

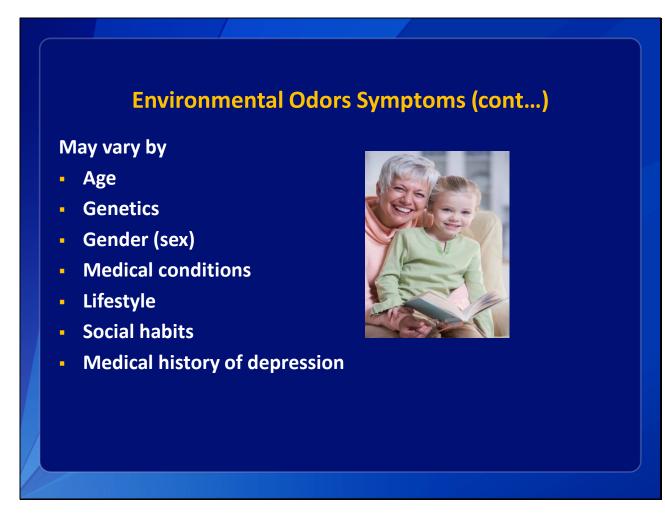
This gave rise to an explanatory model where:

1- Odors may act as a marker for toxicologically significant exposure

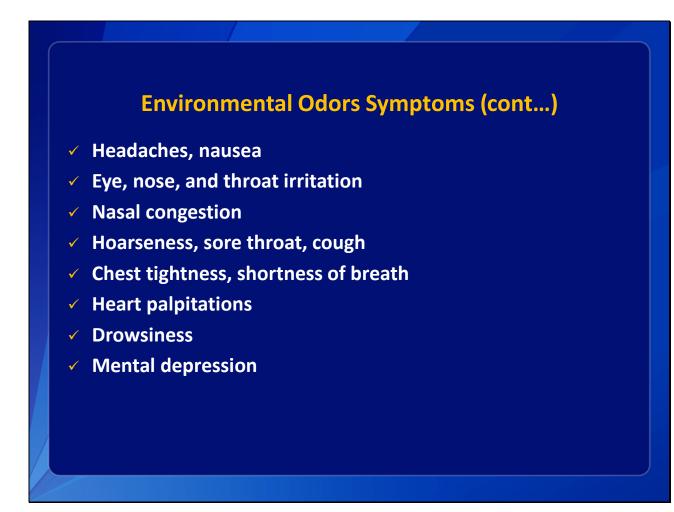
2- Odors may bring on symptoms in their own right

3- Odors <u>serve as a cue for stress-related symptoms</u> among individuals who perceive the odor source as posing a health risk.

Shusterman 1991.

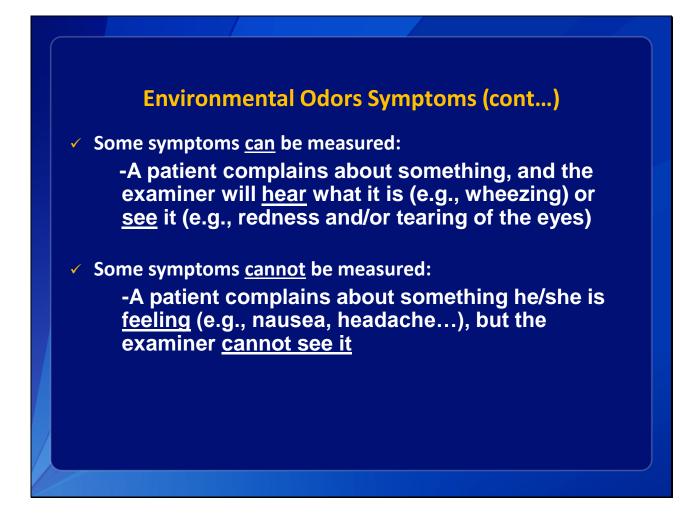


Individual responses may vary. (Dalton, 1999; Shusterman, 2001)
Age → Both the very young and the very old are at increased risk for odor exposure
Genetics → Inherited dislike for an odor
Gender → women are more sensitive to the health effects from odors
Medical Conditions → Individuals with other medical conditions: Asthma, Chronic Obstructive
Pulmonary Disease (COPD), Chronic sinusitis; headaches, migraines, seizures; tachycardia
Life Style → Outdoor exercise with increased risk of exposure
Social Habits → Tobacco use/Environmental Tobacco Smoke (ETS), Alcohol abuse
Medical History → People suffering from mental depression.



Headache and nausea are the most common symptoms.

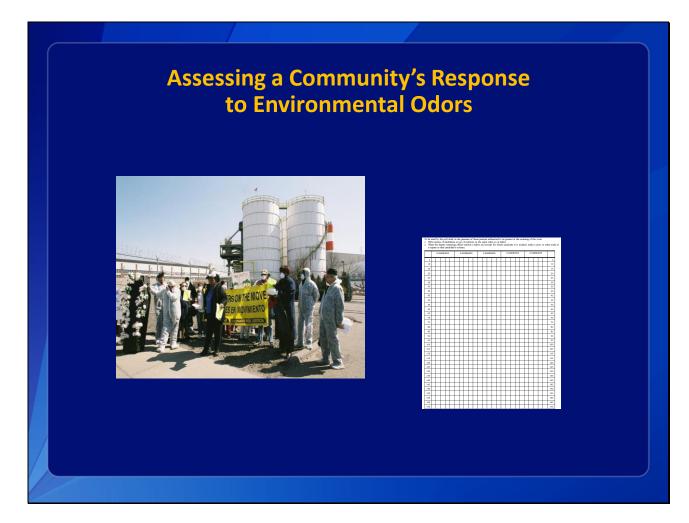




Identifying these differences can prompt the primary health care provider to do a more careful investigation and include other factors (e.g., emotional responses) that may be responsible for the symptoms.



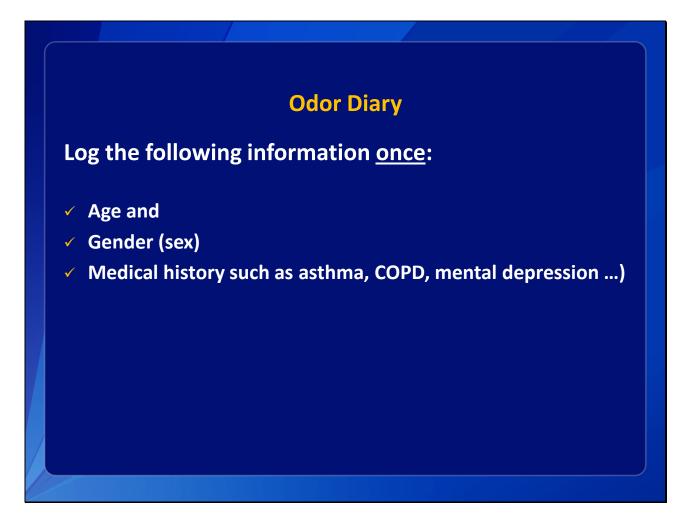




Assessing the community's response to odors is helpful for making recommendations and developing health messages.

An odor diary is one way to assess responses to odors and can be implemented by the community or by environmental or health agencies.



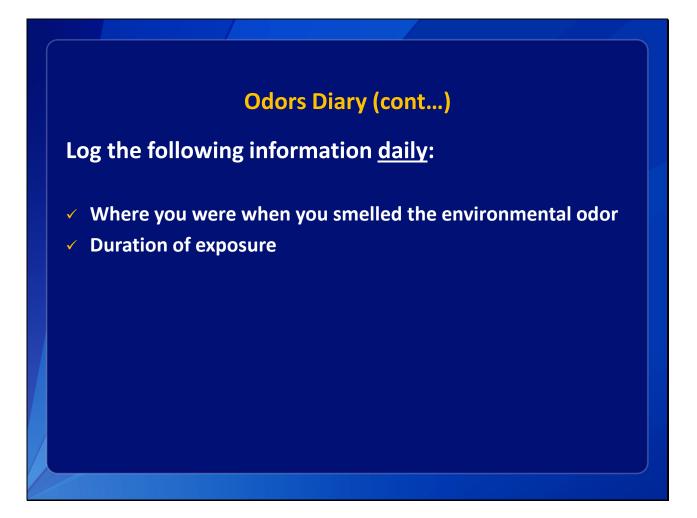


An odor diary is a tool for community members to assess responses to odors.

An odor diary – completed by community members – can help them recognize things like odor types and times of the day when odors are worse.

It includes questions on age, sex, and certain medical conditions, and it can help identify risk factors.

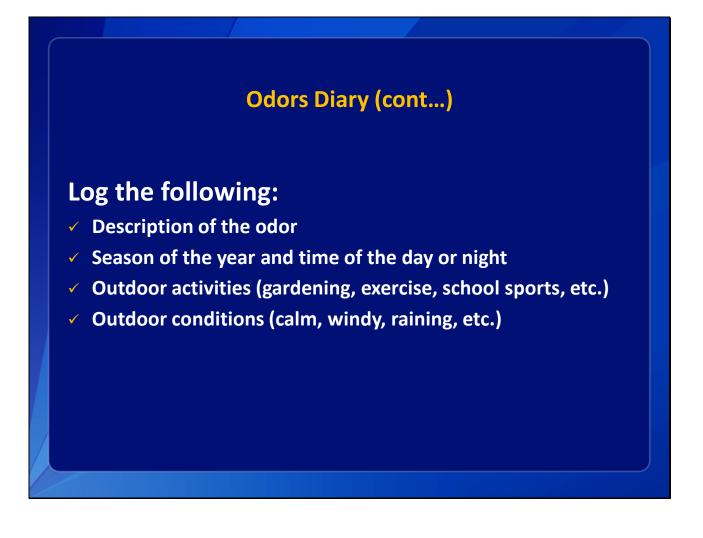




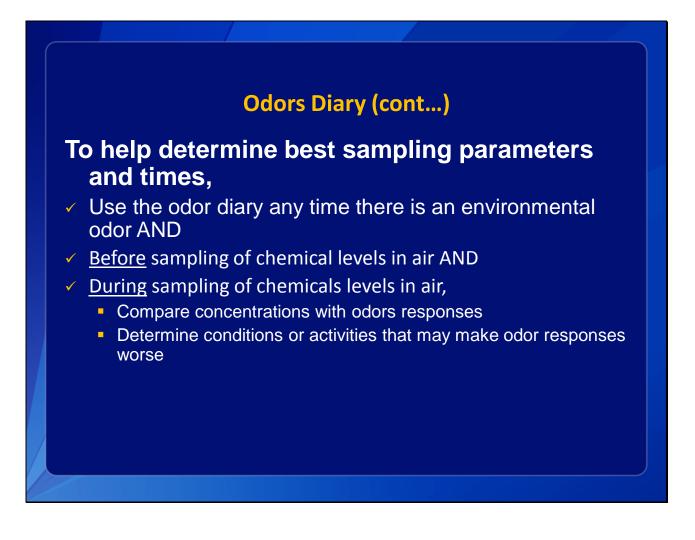
Be sure to include the number of hours each day that you were at the location where you smelled the odors (or the duration of the exposure).

Diaries are easy to fill out. Use them for no more than 2 weeks but fill them out daily during those 2 weeks, even when there is no odor.







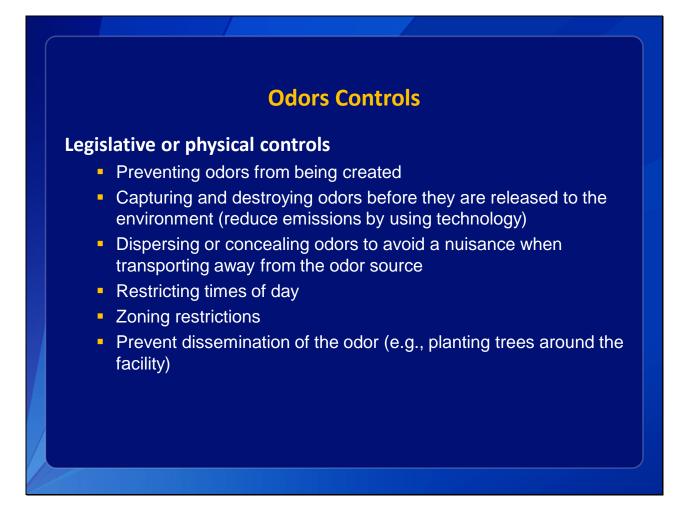


# Before environmental sampling:

If you start using an odor diary before sampling the air, the results may provide information on the **type of odor** and **when it is most prevalent**. People can use this information to determine what chemicals to include in a sampling plan and the best times to sample.

# **During Environmental Sampling:**

Collecting odor information **during sampling** can assist with comparing the recorded concentrations with the odor responses or symptoms it produces. The conditions and activities may provide information on what makes the odor symptoms worse.



**Operational time of day restrictions** – Closing or reducing the odor-producing operations the time(s) of day/week when the odors are worse (as seen in the odor diaries).

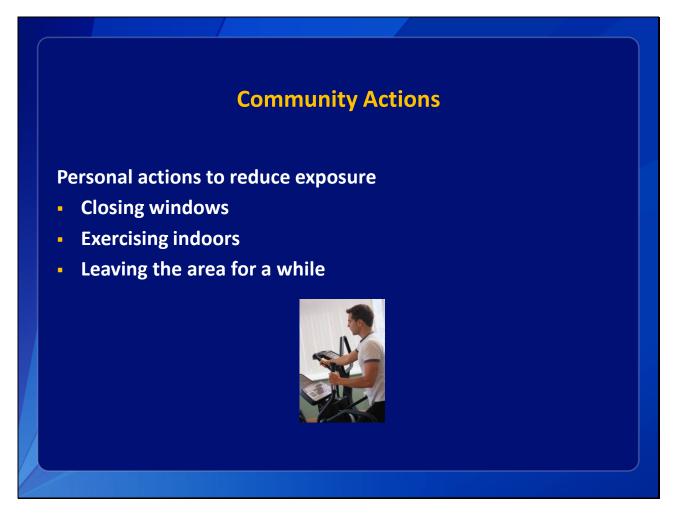
**Zoning restrictions** – Determine where (locations) odors are worse and prevent future odorproducing additions (e.g., upgrades, new construction, new industry, etc.) through zoning restrictions

Reduce emissions- Reduce emission through use of odor control technologies.

Prevent odors from disseminating by planting trees

Sheffield and Bottcher 2000





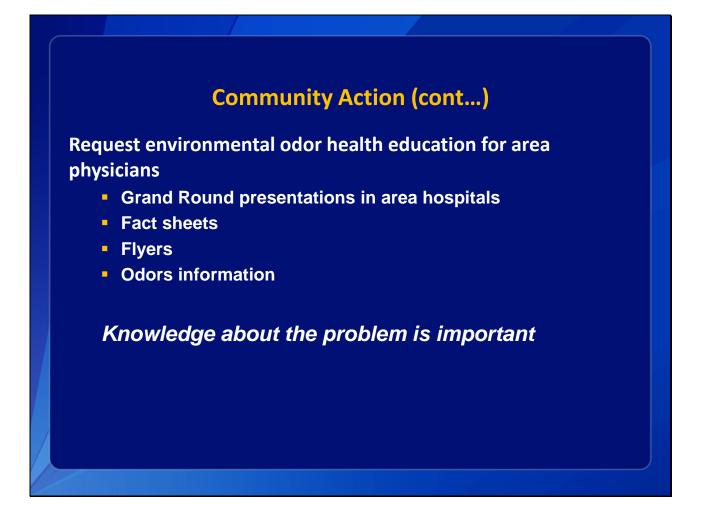
Communities can also help protect themselves by reviewing completed odors diary to determine personal actions people can take to cope with the odors and to develop suggestions for facilities and regulators.



Community members and/or environmental and health agencies can discuss the findings of the odor diaries with the odor-generating facility and/or local legislators/regulators and suggest alternatives when odors are worse.

Tools for reducing odors are effective through local implementation of legislation or goodneighbor relationships.

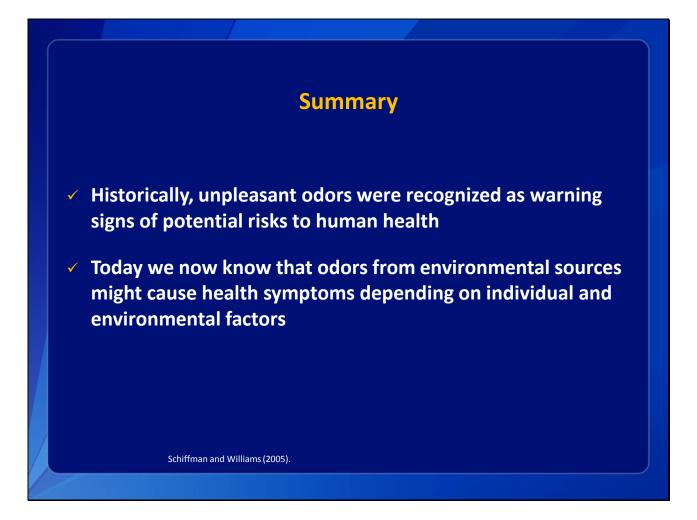




Grand Rounds are presentations of various topics given to health care providers in the hospitals where they work.

Sometimes these presentations are brought to them by organizations wanting to alert the area medical community that something may be affecting the health of their patients.





Historically, "unpleasant odors" have been recognized as "warning" signs of potential risks to human health, not direct triggers of health effects.

Today, we recognize odors can diminish our sense of wellbeing and lead to symptoms such as headaches and nausea.

















