

Striving for a Healthier Community



The North Carolina Department of Health and Human Services (NCDHHS)
and the Agency for Toxic Substances and Disease Registry (ATSDR)

NC Community TDI Report

Overview

In 1997, a plant that makes foam in North Carolina (NC) closed because it was a “public health nuisance.” The plant released toluene diisocyanate (or TDI) and other chemicals into the air. There were odors coming from the plant. People living nearby complained of health problems.

The NC State Health Director asked state agencies to see if the problem was bigger than just this one plant. In part, this study is based on that request. We worked with community members, county health departments, industry, elected officials, and an advisory panel to do this study.

What is TDI and what health problems does it cause?

TDI in liquid form is used to make things like polyurethane foam and spandex. When TDI is mixed with other chemicals, a reaction occurs that creates a solid. During the reaction, some TDI is released into the air. People are exposed to TDI if they touch the liquid TDI or breathe the TDI vapors. TDI causes asthma in some workers.

Why was this study done?

We do not know a lot about TDI exposure and possible health problems among people who live

near plants that release TDI. We did this study for two reasons. We wanted to see if people:

- 1) were being exposed to TDI; and
- 2) reported more breathing problems.

How was the study done?

This study looked at five areas near (within ¼ mile) plants that release TDI and five areas that are located farther away from TDI plants. The communities near plants that release TDI are called target areas. Target areas included communities near Carpenter Company (Conover), Foamex LP

(Cornelius), Hickory Springs Manufacturing (Conover), Olympic Products (Pleasant Garden), and Prestige Fabricators (Asheboro).

We selected plants who reported releasing the most TDI in NC from 1998 to 2004. These plants did not release large amounts of other diisocyanates (HDI and MDI).

To be part of the study, people had to:

1. be at least 18 years old;
2. have lived in their home for at least one year; and



- never worked at a plant that used TDI.

People were told about the study in many different ways. There were public meetings, press releases, mailings, fact sheets, and door-to-door canvassing in the 10 locations.

We asked people questions about their breathing, health, and smoking habits. We asked if they had used products with TDI or similar diisocyanates (HDI and MDI). We asked each person for a blood sample. A laboratory tested the blood for antibodies. These antibody tests can show exposure to TDI, HDI, or MDI. We also tested the air in each area for TDI.

We then looked for a connection between whether people said they had asthma or breathing problems, like asthma, and whether they lived near a TDI releasing plant.

What was found?

In our study, there were 168 people who lived in target areas and 198 who lived in comparison areas.

Air: We took 45 air samples from 19 target area locations. We also took 34 air samples from 20 comparison area locations. We found 1 part per trillion (ppt) of TDI in one sample from a target area. The 1 ppt sample was taken about ¼-mile from Hickory Springs Manufacturing. A second sample from this same location had evidence of TDI. The amount seen was not enough to report. This second sample gives added support that the 1 ppt sample is real. No other samples had any TDI. One ppt is a very small amount of TDI. It is below the lifetime exposure level (10 ppt) that EPA considers safe.

Blood tests: We took blood samples from 161 people from target areas and 190 people from comparison areas. Only one person had antibodies for TDI. This person lived near Olympic Products. This person reported using polyurethane deck sealant. Some urethanes contain diisocyanates.

We found antibodies to HDI and MDI in five people from target areas and in 12 people from comparison areas. Some of these people reported using products that may contain these diisocyanates. Examples of these are spray foam insulation and some glues.

Breathing Problems: Overall, we did not find a connection between living near a TDI releasing plant and having asthma or symptoms like asthma (breathing problems).

Public Health Consideration: Although we did not find a significant relationship, there were site-specific differences that call for a closer look. For example, more breathing problems like asthma were reported in three target areas. The relationship was statistically significant only at the Carpenter target area. Two of these plants (Carpenter and Hickory Springs) have had the highest TDI emissions in the past. Hickory Springs still has the highest emissions. Also, the 1 ppt result was outside a home located close to ¼-mile away from Hickory Springs.



Even though we cannot say there is a relationship between having asthma, or symptoms like asthma, and living near a TDI plant, a closer review of these plants' emissions data is a good idea from a public health perspective.

What does this mean?

We did not find a scientific connection between respiratory problems and exposure to TDI. Overall, we did not find that people living near the plants that emit TDI have recent or current exposure to TDI at levels of health concern.

What next?

1) We have asked the North Carolina Division of Air Quality to review Hickory Spring and Carpenter Company operating conditions and emission estimates.

- 2) If you get short of breath or wheeze and have not talked to a doctor about it, you should see your medical care provider. We recommend this no matter where you live. We recommend taking this report with you so that your provider can read it.
- 3) If your provider has questions, he or she can contact Dr. Ricky Langley at the North Carolina Department of Health and Human Services (919-707-5900).
- 4) Your medical provider can also go to the following Charlotte Area Education Center (AHEC) link and take a short class on this topic: www.citahec.org/ce/program_schedule/details.cfm?EventID=28202

How can I find out more?

North Carolina has a website where you can learn more: www.epi.state.nc.us/epi/oe/tdi.html

You can also call the toll-free N.C. CARE-LINE at 1-888-662-7030. The TTY number for the hearing impaired is 1-877-452-2514. Ask to speak with Dr. Ricky Langley. You can also call Dr. Langley at 919-707-5900.

You can call ATSDR at 1-800-CDC-INFO (1-800-232-4636). The TTY number for the hearing impaired is 1-888-232-6348. Ask to speak with Lynn Wilder or Dr. Dan Middleton.



State of North Carolina
 Department of Health and Human Services
 Division of Public Health
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