Q & A

N.C. Community Health Study:
Exposure to TDI (Toluene Diisocyanate) and Respiratory Health

(updated 4/29/08)

Q: What is TDI?

A: TDI stands for the chemical toluene diisocyanate, which is primarily used in the manufacture of polyurethane products such as foam (cushions), sealants, and polyurethane coatings.

Q: How does TDI affect health?

A: A small percentage of workers who use TDI develop asthma. Some other TDI-exposed workers have difficulty breathing, get rashes and suffer from headaches. However, not all workers who come in contact with this chemical experience health problems.

Q: Why is this study being done?

A: Although much is known about job-related exposures, there is very little information on how low levels of TDI exposure affect the health of the general public. That knowledge will help protect public health. This study looks at communities where TDI is emitted. It also looks at communities where there are no known TDI emissions. Comparing the results of the two types of communities will determine if there are differences.

Q: Are there people living near sources of TDI who have become sick or complained about health problems?

A: No. There have been no reports of sickness from communities near TDI sources.

Q: What does the study involve?

A: This study compares information from people who live near TDI sources with information from people who do not live near TDI emissions sources. The study team went into selected communities and asked residents to participate. The participants were asked questions about their respiratory health and were asked to give a small blood sample to be tested for indications of exposure to TDI. The study team also took air samples in several different locations to test for TDI. The results will help public health agencies determine if the results from groups of people near TDI sources are different from those of other groups. The air testing results will show if TDI is present. These test results will not tell the study volunteers if their individual health is being affected by where they live. It will only indicate patterns of community health.

Q: Did the study questionnaire ask about other health conditions than those related to respiratory health?

A: No. The questionnaire focused on respiratory health status.

Q: Why were people asked for blood samples?

A: A blood sample was taken to find out if the individual was exposed to TDI compounds. The presence of certain antibodies (biological markers) in a person's blood indicates a previous exposure to TDI or a similar chemical. The blood test results will help researchers to better understand whether a community-type exposure to TDI is possible.

Q: How long will the study take?

A: The field work began in May 2007. It took several months to collect survey responses, information, and air and blood samples as the study moved from community to community. Researchers finished gathering the information in January 2008. It will take at least a year for the data analysis, report writing, and review and approvals of the final report by the scientific community. The final report is expected to be published in 2009.

Q: Who is conducting this study?

A: The North Carolina Department of Health and Human Services **(**NC DHHS) - Division of Public Health and the Agency for Toxic Substances and Disease Registry (ATSDR), which is a federal public health agency, are doing this study.

Q: Why is this study being done in North Carolina?

A: ATSDR announced funding for this study in the Federal Register. NC DHHS applied for and was awarded funding for this study. North Carolina has several large TDI emissions sources, so public health authorities felt this was a good opportunity to explore this issue.

Q: Where did the study activities take place?

A: The survey and testing were done in 10 communities in four counties — Catawba, Randolph, Guilford and Mecklenburg. Half were communities near TDI emission sources (called target communities) and half were not near TDI emission sources (called comparison communities). Maps of the study areas are on the N.C. Public Health web site at www.epi.state.nc.us/epi/oee/tdi.html .

Q: Is there a health problem in these communities?

There have not been any reported health problems related to TDI emissions in the selected communities. This type of study is the first step in seeing if there might be exposures to TDI and respiratory health symptoms in people living near facilities emitting TDI. If any differences are found between the two types of communities, more study will be required to determine the reason for those differences.

Q: Why did testing take place in so many communities?

A: Researchers need 400 to 500 adult volunteers—half living within ¼ mile of a TDI emissions source and the rest living in similar communities that are not near a TDI emissions source.

Q: Which TDI sources are in the target communities?

A: In order of priority for this study, the TDI sources were:

- Hickory Springs Manufacturing in Conover, Catawba County
- Carpenter Company in Conover, Catawba County
- Olympic Products (formerly Vita Foam) in Pleasant Garden, Guilford County
- Foamex LP in Cornelius, Mecklenburg County
- Prestige Fabricators in Asheboro, Randolph County

Q: How were the TDI sources picked?

A: Researchers picked the companies that reported the highest average release of TDI between 1998 and 2004, using the U.S. Environmental Protection Agency's (EPA's) Toxic Release Inventory (TRI) database (http://www.epa.gov/tri/), and that met the other study criteria.

Q: How were the comparison communities picked?

A: Researchers picked one comparison community for each target community. Each was in the same county as its target community and was similar to it with regard to residents' ages, races, and income levels.

Q: Where are the comparison communities?

A: The selected comparison communities are in Conover in Catawba County, Asheboro in Randolph County, McLeansville in Guilford County, and Huntersville in Mecklenburg County.

Q: Were children tested?

A: Only adults, age 18 or older, were tested.

Q: Can this study show that someone's asthma is due to where they live?

A: This study is looking at patterns of community health and not at any individual's health conditions or the causes of any one person's health problems. Upon request, a physician with the study team can speak with a person's health care provider about environmental factors that can trigger asthma.

Q: What does it mean if there are positive blood test results for TDI exposure? And what about negative results?

A: A positive antibody test simply indicates exposure to TDI or a similar chemical. At the same time, negative results do not rule out exposure. If more positive blood tests are found in people who live in communities near TDI sources than those who live further away, that may indicate the need for further community studies.

Q: How long will it take to get results of the blood tests?

A: It will take up to a year to send people the results of their lab tests. Blood samples are sent to the lab where they are stored until enough other samples arrive to be tested. This is the most cost-effective approach. Once the samples are tested, researchers need to make sure that the results are correct and every result is matched with the right person. The researchers will mail participants their test results. .

Q: What will happen if the study finds TDI in the air?

A: Several things could happen if TDI is found in the air. Once the researchers receive and review the air sample test results, they can tell if there might be a health problem. If there is, they will work with the local health department, the state environmental and health departments, the community and the company to make sure there is not a problem. The air sample results will be included in the community report.

Q: If the study finds a problem, who will fix it?

A: If researchers find TDI in the air at levels that they think might pose a health problem, they will work with the North Carolina Division of Air Quality, the TDI emission source, and the local health department to evaluate the amount of TDI getting into the air and to discuss solutions.

Q: **Have any of the TDI emission sources in this study committed any violations of state air quality laws?**

A: No. All of these TDI emission sources are in compliance with state air quality regulations.

Q: If the companies are in compliance with state and federal regulations, why do researchers need to sample the air?

A: Researchers sampled the air to determine if community exposures to TDI are possible. Although North Carolina has one of the toughest TDI standards in the country, researchers want to ensure that it is tough enough to protect the surrounding community. In order to have a quality study, air sampling is important and provides needed data. The N.C. Division of Public Health and ATSDR are doing the study to assess the health of communities and to ensure protection of public health.

Q: Does industry know about this study?

A: Yes.

Q: Where can I get more information?

A: If you have questions about the study, you can call the toll-free N.C. CARE-LINE, 1-800-662-7030 (TTY: 1-877-452-2514).