

# Air Pollution Ignores State Borders

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A decade ago, residents of Western North Carolina did not need any special equipment to tell them that their air was polluted. They could see the pollution and smell it; on some days, they could even taste it. On those days, their mountains were shrouded in gray—not a morning mist, but a haze of ozone, sulfur dioxide, nitrogen dioxide, and toxic particulates that caused asthma and even death. This chemical fog was killing trees and forming mercury compounds that seeped into the ground and into the water, thus contaminating fish. Worst of all, people were being poisoned in their own backyards with every breath they took. If the situation remained unchanged, local doctors would have to continue to tell their patients with asthma or other respiratory illnesses to stay indoors on days when pollution levels were high. Employers would continue to lose money because of employee illnesses, students would continue to miss school due to asthma attacks, and hospitalizations for respiratory illnesses would continue to rise. The problem was clear but difficult questions remained: What should be done? Who should be held accountable?

Coal-fired plants run by the Tennessee Valley Authority (TVA) were pumping pollution over the state border and into North Carolina's mountains. The utility had promised to clean up the pollution but had moved slowly, and the damage it caused was spreading. As North Carolina Attorney General, in 2006 I filed suit against the TVA on behalf of the state, saying that the pollution was a public nuisance and demanding that it stop. The lawsuit was a last resort. Our office had tried negotiating with the utility, but without the power of a court order, we had no way to ensure results.

Within its borders, North Carolina was already doing its part to slow pollution. With urging from the governor and from our office, North Carolina legislators and utilities had agreed on the provisions of the 2002 Clean Smokestacks Act [1]. This act required North Carolina utilities to reduce coal-fired plant emissions and to speed cleanup. However, we could make no such requirements of our upwind neighbors. Thus, the TVA—the nation's largest public utility, with plants not just in Tennessee but also in nearby states—was continuing to pump toxic fumes into Great Smoky Mountains National Park, the counties of Western North Carolina, and beyond.

The Clean Smokestacks Act directs the state to “use all available resources and means . . . to induce other states and entities, including the Tennessee Valley Authority, to achieve reductions in emissions” [1]. The legal theory we used was not new, but the scale of the case was. Our claim was that the TVA's pollution had reached such a stage that it was literally a nuisance to the public. In general terms, this kind of lawsuit is used when public health and safety are endangered and cost-effective solutions are readily available.

Our research showed that the health of North Carolinians was threatened. Experts estimated that if the TVA reduced particulate matter and other airborne toxins, it could prevent 19,000 exacerbated asthma attacks, 99 early deaths, and dozens or even hundreds of emergency department visits and hospital admissions every year in North Carolina [2]. When neighboring states were included in the affected area, the health benefits were expected to reach tens of thousands of people. In addition,

ing allows for a wide range of care management activities designed to achieve these goals. Care managers can work with families over the phone or in person. They can accompany a patient to medical appointments, which can help the care manager understand the care plan recommended by the provider and can help the family operationalize that plan. Care managers can provide extra asthma education on topics such as the physiology of asthma, triggers, symptom recognition, how and when to use medicines and delivery devices (eg, spacers), and how to follow an asthma management plan. Care managers can also make home visits that help them to understand the social and environmental context in which the family is trying to manage this chronic disease. Environmental triggers in the home can be identified, and advice on how to mitigate those triggers can be provided. The care manager can also address barriers to care—lack of transportation, for example. Finally, the care manager can help the family organize the home in a way that facilitates consistent chronic disease management—for instance, they can help the family decide where to store medicines and where to post the asthma management plan.

## Local Initiatives and Collaborations

Local initiatives and collaborations further add to statewide activities. Strong evidence supports the effectiveness of home-based, multi-trigger, multicomponent interventions with an environmental focus, because such interventions can improve asthma symptoms, quality of life, and productivity for children and adolescents with asthma [7, 8]. For example, one CCNC network, Community Care of Wake and Johnston Counties, is working in partnership with Wake County Environmental Services and Wake County Human Services to deliver a multidisciplinary, home-based, environmental trigger assessment and mitigation initiative led by a registered sanitarian and a nurse care manager. This initiative shows an average of \$700 in savings per patient, secondary to decreased rates of ED visits and hospitalizations for asthma. In addition, this initiative achieved substantial decreases in network-wide asthma ED rates (from 40 visits per 1,000 member-months in 2003 to 17 visits per 1,000 member-months in 2012) and asthma hospital admission rates (from 8.3 hospitalizations per 1,000 member-months

the pollution was causing our state and its businesses to lose billions in health care dollars and lost workdays [3]. The state was also losing tourism dollars when Grandfather Mountain and the views from the Biltmore Estate were obscured by smog [4]. It was clear to me that action was needed.

After a hard-fought trial, Judge Lacy Thornburg saw it our way, setting limits on emissions and deadlines for improvement at several plants. The TVA fought our attorneys on appeal, but in the end we agreed on a landmark settlement [5], which required the TVA to either close its coal-fired plants or speed installation of pollution control equipment. The TVA also agreed to send \$11.2 million to North Carolina to fund energy efficiency programs. What is most important is that the settlement is reducing harmful emissions and significantly improving views of the mountains. The dollar value of the health benefits alone is estimated to be \$672 million per year [3].

Meanwhile, the fight for clean air continues, with a case about the Cross-State Air Pollution Rule of the Environmental Protection Agency (EPA) going to the Supreme Court of the United States this year. Having obtained a federal court order in 2008 to force the EPA to adopt stricter clean air guidelines [6], North Carolina is now fighting alongside the EPA to ensure that upwind states promptly control their pollution. Specifically, our attorneys are arguing that the federal Clean Air Act demands that states *proactively* mitigate their impacts on other states, rather than putting off their responsibilities to downwind states and waiting for the EPA to solve their problems for them.

In the end, the case we brought under the Clean Smokestacks Act was a success for the public health and the economy of North Carolina. The TVA is making changes for the better. Although collaboration and negotiation should always be the first choice, litigation can be an ef-

fective tool when widespread damage to public health and the economy goes unabated. **NCMJ**

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in 2003 to 1.9 hospitalizations per 1,000 member-months in 2012). This collaboration received a 2013 Achievement Award in Health from the National Association of Counties. Other CCNC networks—including Northern Piedmont Community Care, Northwest Community Care Network, and Community Care of the Lower Cape Fear—are beginning similar activities to address environmental asthma triggers. The Healthy Homes training offered by the University of North Carolina's Gillings School of Global Public Health is helping to spread these activities.

#### Quality Metrics

Chart review and claims-based measures are used to foster continuous quality improvement initiatives within practices, networks, and the statewide CCNC program. Improvements in all metrics have been achieved. Figure 1 shows chart-review measures, including the percentage of patients with documentation of at least 1 continued care visit with assessment of symptom control, trigger assessment, and provision of a written asthma management plan. An additional measure noting the percentage of patients with

persistent asthma with documentation of a prescription for controller medicine was added in 2011. This measure is the only one with a comparable national HEDIS (Healthcare Effectiveness Data and Information Set) benchmark, and CCNC results show high rates of performance on this measure. In 2011, 93.6% of patients with persistent asthma were prescribed a controller medication. This percentage increased to 95.5% in 2012. These percentages exceed the 90th percentile for national 2011 HEDIS benchmarks for Medicaid Managed Care Organizations, which is 90.6%.

In early evaluations of CCNC's asthma initiatives, 2 published studies [9, 10] found sizeable decreases in rates of hospitalization and ED use for asthma. An evaluation by the University of North Carolina's Cecil G. Sheps Center for Health Services Research [9] showed substantially lower rates of ED visits and inpatient admissions during the period 2000–2002 for Carolina ACCESS Medicaid patients who were enrolled in CCNC than for those who were not. A subsequent study [10] showed a 16.6% decline in the rate of ED visits and a 40% decrease in the rate of inpatient admissions for CCNC-enrolled patients with a diagnosis of asthma