Inquiro, the UAB undergraduate science research journal

Volume 2014 | Number 8 Article 4

2014

Birmingham Pollution: No Longer the "Toxic City"?

Alex Chang

Birmingham Pollution: No Longer the "Toxic City"?

Alex Chang

Birmingham, Alabama, nicknamed the Steel City, has been the industrial center for steel and iron production in the South since the late 1800s. Immediately following the Civil War, Southern investors and Northern bankers pulled together to create large blast furnace complexes, taking advantage of the iron ore, coal, and limestone deposits in Jefferson County (Trent 2007). At one point, Birmingham provided 40 % of the United States' total output of foundry pig iron. The advent of the steel industry spurred the rapid post-Civil War growth that gave Birmingham its other nickname, the Magic City. But Birmingham's early economic successes came at a cost indicated by yet another, less flattering, appellation it has sometimes received: the Toxic City.

For over a century, steel and iron production facilities have been polluting the air of Jefferson County with toxic metals. The soil and water of the region have been damaged along with the air, and Jefferson County's coal-fired power plants are at issue in addition to its foundries. Annually, Alabama's coal-fired power plants release 15 million pounds of toxic metals in on-site ash ponds, and the Alabama Power Company's Miller Steam Plant in western Jefferson County alone releases more toxic metals than any other power plant in the country (Spencer 2012).

After being pushed to the side for many years, the issue of pollution became more of a reality after incidents in neighboring states, such as the 2008 rupture at the Tennessee Valley Authority's Kingston fossil plant, were exposed by the media. As a result of the increasing publicity that pollution began to receive, North Birmingham and Jefferson County residents became concerned regarding local conditions, and community leaders requested that the Jefferson County Department of Health (JCDH) conduct a study of toxic air pollutants in the Jefferson County area.

The Birmingham Air Toxics Study (BATS), held between July 2005 and June 2006 and run by the JCDH, monitored toxic air pollutants in East Thomas, North Birmingham, Providence, and Shuttlesworth. The study aimed to "assess the potential health effects resulting from the local population's exposure to chemicals in ambient air" (JCDH 2009a). A total of 102 air pollutants were collected and tested from all four of the areas to see what potential risks and hazards existed. Fourteen of the 102 air pollutants exceeded the Upper Confidence Level (UCL) set by the Office of Air Quality, Planning and Standards (OAQPS) (JCDH 2009a). The results from this study point to the reasonable assumption that the number of cancer patients should have been increasing due to exposure to toxic metals present in the air; however, several studies analyzing a long period of time have proved that this has not been the case.

Upon examining the death logs of African Americans in Jefferson County from 2000 to 2009, the JCDH noted that "the overall death rate for all causes of death combined, deaths from all cancers combined, and for the following cancers individually: breast, leukemia, liver and lung, were statistically the same…"(JCDH 2009b) . Furthermore, "the death rates from asthma and chronic obstructive pulmonary disease (COPD) were statistically the same…" (JCDH 2009b). Although the potential risk for cancer may indeed

The iconic Sloss Furnaces symbolize both Birmingham's early economic might and the environmental costs that its industries eventually imposed on the region.

be significantly greater in these areas due to the marked increase of pollutants in the air, the number of Jefferson County citizens dying from cancer does not appear to have changed at all in the recent past.

Another examination of logs in the Alabama Cancer Registry from 2002 to 2011 noted that cancer rates among African Americans in North Birmingham showed little difference from those among African Americans in the rest of Alabama. The incidence rates of cancers that were typically related to air, water, or soil pollution were consistent throughout the African American population of Alabama regardless of location. Furthermore, the rates of cancers of the lung, stomach, colon and rectum, liver, pancreas, urinary bladder, lymphoma, and leukemia, "checked out to be within the bounds of the rest of the country's rates" (JCDH 2014). Thus, there is no statistically significant increase in the frequency of cancer as a result of pollution in North Birmingham or Jefferson County.

African Americans were observed in these studies because the area that was studied, ZIP code 35207, is predominately African American (93.0 % African American, 5.6 % white, and 1.4 % other). However, because Jefferson County in general is 42.7 % African American, 55.2 % white, and 2.2 % other, and Alabama overall is 26.9 % African American, 70.9 % White, and 2.1 % other (JCDH 2014), the applicability of the JCDH study to Jefferson County and Alabama as a whole is not circumspect. One possible confound is the fact that some groups of cancers have markedly different rates of incidence among different races in the national population. For example, whites exhibit more oral cavity and pharynx cancer, while African Americans exhibit more esophagus and stomach cancer (JCDH 2014). If some of these cancers are also more or less influenced than others by exposure to pollutants, it becomes less clear how the results of the JCDH study should be interpreted beyond the study region.

A more recent study by the United States Environmental Protection Agency (EPA) had the Agency for Toxic Substances and Disease Registry (ATSDR) look through environmental data for areas around the Walter Coke Inc. facility in North Birmingham to determine if exposure to air contaminants is a public hazard for people who live or work in the area. Unlike past readings of air contaminant levels, as in the BATS study, the more recent ATSDR sampling revealed a decrease in the total air contamination. Instead of exceeding the UCL value, the amount of contaminants in the air matched the minimum EPA target for minimizing cancer risk and even dropped below this value in some areas. Past readings averaged with more recent data result in the estimate that two out of 10,000 people in the Birmingham area will develop cancer if exposed to these contaminants (Department of Health and Human Services 2014).

In the final analysis, recent studies point to the conclusion that pollution does not result in increased risk of cancer in the Birmingham area, but do not conclude that there are no health problems related to pollution. Compared to the rest of the country, Birmingham is no longer a toxic city, but rather is on the low end of the pollution spectrum for major urban centers. Furthermore, in a study recently released by researchers at John Hopkins University, results suggested that cancer risk is often dominated by genetic factors over environmental ones. This does not mean that Birmingham and the rest of the country has no reason to curb pollution, or that environmental factors do not influence cancer risk substantially; but it, along with the most recent environmental data, may mean that Jefferson County residents can breathe a little easier knowing that the health risks they face from pollution are not as great as some once thought (Tomasetti, C. & Vogelstein, B. 2015).

References

1. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry. 2014. Evaluation of Air Exposures in Communities Adjacent to the 35th Avenue Site, Birmingham, Alabama. Retrieved October 9, 2014, from http://www.atsdr.cdc.gov/HAC/pha/

NorthBirminghamAirSite/35th %20Avenue %20Site_PHA_PC_06-26-2014_508.pdf

2. Jefferson County Department of Health, Environmental Services Air and Radiation Protection Division. 2009a. Birmingham Air Toxics Study. Retrieved October 9, 2014, from http://www.jcdh.org/misc/ViewBLOB.aspx?BLOBId=182
3. Jefferson County Department of Health. 2009b. Summary from the Comparison of Death Rates and Birth Outcomes of African-Americans Living in Collegeville, Fairmont and Harriman Park to African-Americans Living in the Rest of Jefferson County, Alabama. Retrieved October 9, 2014, from http://s3.documentcloud.org/documents/1263058/death-rates-and-birth-outcomes-of-blacks-in-n.pdf
4. Jefferson County Department of Health. 2014. Notes on Interpreting the "Comparison of Cancer Incidence Rates for Zip Code 35207 to Jefferson County" (and Alabama). Retrieved October 9, 2014, from http://www.scribd.com/doc/237631623/JCDH-Health-Data
5. Sloss Furnaces. [Web Photo]. Retrieved October 9, 2014, from http://slossfurnaces.com/history/becoming-sloss-furnaces-national-historic-landmark/
6. Spencer, T. (2012, January 6). Jefferson County Plant Disposes Most Toxic Ash in US. Retrieved October 9, 2014, from http://blog.al.com/spotnews/2012/01/jefferson_county_plant_dispose.html
7. Tomasetti, C., & Vogelstein, B. (2015). Variation in cancer risk among tissues can be explained by the number of stem cell divisions. Science, 347(6217), 78-81. Retrieved February 7, 2015, from http://www.sciencemag.org/content/347/6217/78.abstract
8. Trent, C. (2007, August 8). A Look into Alabama's Iron and Steel Industry. Retrieved October 9, 2014, from http://cber.cba.ua.edu/rbriefs/ab2007q3_steel.pdf