



It is regrettable that some groups have sought to stoke public fears by raising distorted claims of possible health impacts from our swine operations. These claims continue to surprise and befuddled our farmers who live on their farms, drink the water from wells on their farms, breathe the air on their farms and have raised multiple generations of family members on their farms.

Dr. Annette M. O’Conner, a professor at Iowa State University, and a team of researchers in 2017 published a systemic review of the literature in which there were possible associations with animal feeding operations and health outcomes described, concluding that “no consistent dose response relationship between exposure and disease was observable.”¹

Dr. Keith Ramsey, the medical director of infectious disease control at Pitt County Memorial Hospital, and former chairman of the Pitt County Board of Health, has conducted clinical and research studies involving residents across eastern North Carolina in regard to health outcomes and in particular in possible association with swine operations. In a report², he concluded: “I have observed no indication that living near a hog farm causes any increased risk of infection by antibiotic-resistant or any other bacteria... The real health threats needing attention in eastern North Carolina are diet and lifestyle...not hog farms.”

We urge caution and interested parties to fully understand the data and methodologies used in any such reports that discuss such claims.

¹ Annette O’Connor, et al, Iowa State University, “Updated systematic review: associations between proximity to animal feeding operations and health of individuals in nearby communities.” (2017).

² See “Expert Report of Dr. Expert Report of Dr. Keith Ramsey, M.D. In re NC Swine Farm Nuisance Litg. 5:15-CV-13-BR”

Some opponents of our farms have begun highlighting a story in the North Carolina Medical Journal (NCMJ) that is being inaccurately described as showing that confined animal feeding operations cause increased risk of mortality in “communities” in association with confined animal feeding operations. However, the authors acknowledge they do not establish any causation. Most importantly, the authors also did not study “communities” around DEQ permitted swine operations. Additionally, the underlying study was funded by an avowed opponent of the commercial swine industry in North Carolina and should be viewed in that context.³

What the study did do was examine mortality data from the Centers for Disease Control, from 2007 to 2013, at the ZIP code level in North Carolina and cross-reference that data with permitted swine operations.

Dr. Andres Perez, a veterinary epidemiologist at the University of Minnesota who has reviewed the study, concluded that it suffers from limitations in design and that it represents an “ecological fallacy.”⁴ The study’s authors, for example, have previously presented on their work and described finding that there is also an association with HIV and confined animal feeding operations, for which there is no plausible biological foundation to suggest causation. Yet, that particular associated result was not reported in the NCMJ study. Dr. Perez concluded that the choice of a ZIP code level analysis has produced a “modifiable areal unit problem,” or MAUP, which is the name that, in ecological studies, is given to the limitations associated with the artificial increment in the number of observations (MAUP’s scale effect) and the arbitrary selection of boundaries (MAUP’s zoning effect). The authors did not discuss this potential limitation in the study.

In addition, the study relies on a crucial choice that a ZIP code with a “high density” of pigs is one with greater than 215 animals per square kilometer. A square kilometer – like a 3-mile radius – is likely difficult to comprehend to a lay person. A square kilometer is equal to 247 acres of land, thus making the study one that focused

³ In multiple venues, the NCMJ authors have thanked Fred Stanback of Salisbury, N.C., for funding their work. Stanback is a prolific political donor and funder of litigation and activist groups against the N.C. swine industry.

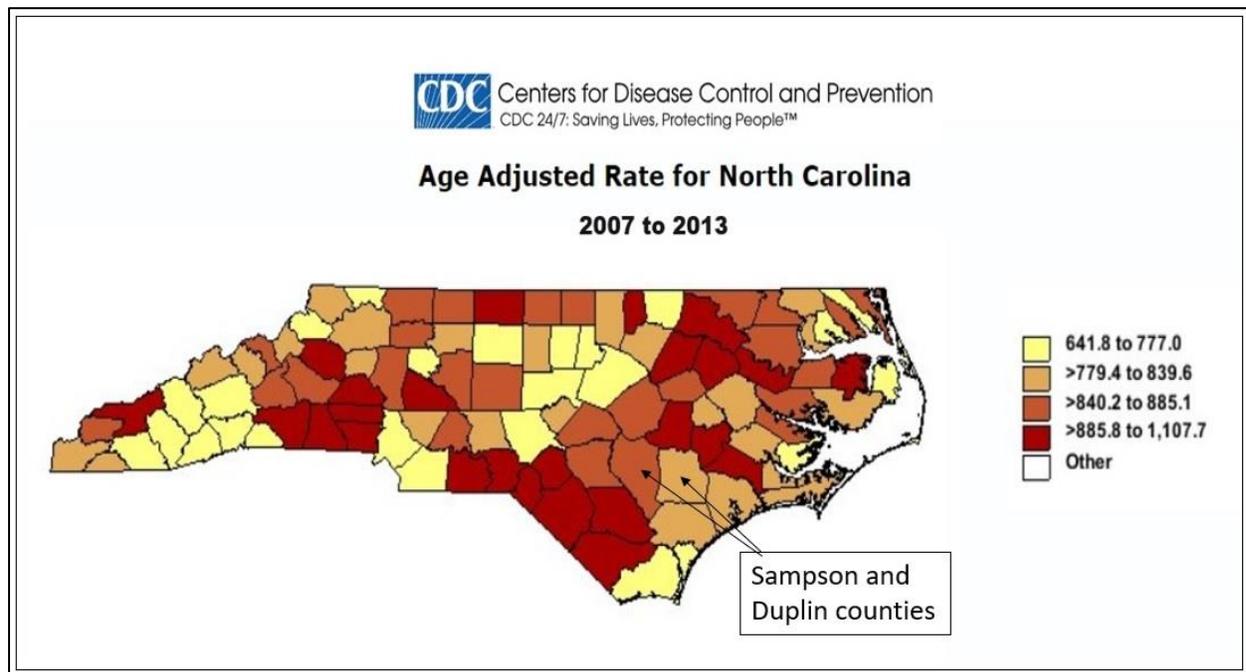
⁴ Andres Perez, University of Minnesota, “Independent Assessment (of) Kravchenko et al.” (Oct. 2018).

on ZIP codes that have from about 1 to perhaps 6 pigs per acre compared with those ZIP codes with fewer than that.

Perez’s review found: “It is not possible to demonstrate that hog operations cause any of the adverse health outcomes described in the manuscript. This limitation is acknowledged by the authors...a few times in the manuscript, although the conclusions and title, erroneously, seem to imply something different.”

Extreme activist advocates are misusing the report and are ignoring its own data. Again, we urge caution.

Health care is organized at the county and regional level in North Carolina. The Centers for Disease Control reports mortality for the years 2007 to 2013 by county as follows, with the darker areas indicating higher rates of mortality:



As is clear from the mapping of CDC data, mortality rates vary across the state – with significantly higher mortality rates in areas (shown in darker colors) with no pigs or hogs. Causes of increased mortality include smoking and obesity. Sampson County and Duplin County account for approximately 40 percent of the pigs and hogs

raised in the state. Both, as shown, are not in the highest quartile in the state for mortality. Notably, the relative levels of increased mortality that are shown along the North Carolina/South Carolina border do not stop at the border. Mortality rates are high in those regions across the border – regions with little to no pig or hog production.

Duplin County in North Carolina often has more pigs than any other in the nation. And every ZIP code in that county qualifies as “dense” (1 to approximately 6 pigs per acre) for the study in the NCMJ report. Yet, Duplin’s mortality rate is *lower* than the state average, and it is in the next-to-lowest quartile, as shown in the map. To be sure, there are categories of mortality that are above the state average in Duplin County – namely assaults and traffic accidents that lead to death. Those unfortunate health outcomes are not associated with our swine operations.

Here are the top counties in North Carolina for mortality (left), with the age adjusted rate, and the top pig and hog producing counties (right), with their ranking in the state by the same measure, using the same source data set as NCMJ:

Age-adjusted all-cause mortality rates, all ages and races, CDC 2007 to 2013		
County	Age Adjusted Rate	NC RANK
Swain	1107.7	1
Columbus	1037.3	2
Richmond	1032.9	3
Robeson	990.5	4
Martin	986.1	5
Cleveland	982.8	6
Scotland	976.8	7
Lenoir	962.7	8
Gaston	959.1	9
Halifax	956.3	10

Top pig and hog producing counties in NC and all-cause mortality rank, CDC 2007 to 2013		
County	RANK of 100	Age Adjusted Rate
Sampson	30	881.4
Duplin	66	801.9
Bladen	11	936.7
Wayne	23	890.1
Greene	54	833.1
Jones	18	911.9
Onslow	73	788.5

Opponents of livestock agriculture tend to point to similar studies, where no causation is determined and where the actual data and methodologies must be fully understood. For example, opponents in public settings and public comments⁵

⁵ Comment letter, “Re: Renewal of North Carolina State General Permits to Control Animal Waste...” dated December 6, 2013, submitted to Christine Lawson at DEQ from Earth Justice, the Waterkeeper Alliance and Southern Environmental Law Center.

submitted to the state of North Carolina, have suggested that hog farms cause higher rates of asthma. They cite a study that purports to find an association with middle school student “wheezing” and farms. Again, the underlying data and methodology does not support the claim. The data in the study itself shows that students within 2 miles of a farm had lower reports of wheezing than those in a zone farther away (from 2 miles to 3 miles). Students within 2 miles of a farm reported almost identical amounts of wheezing as the rest of the state. Additionally, data compiled at the state’s Center for Health Statistics and the N.C. Area Health Education Centers shows that incidences of asthma are not associated with the significant pig and hog producing counties.⁶

Complainants suggest that odor is common in our communities and may impact health outcomes, and they again point to studies with heavy involvement by Steve Wing of Chapel Hill⁷. The data from an often-cited Wing study was drawn from volunteers recruited by him and a community group with whom he closely worked and made arrangements.⁸ The community volunteers were provided negative information about farms and then asked to keep a weekly diary, noting and rating odor on a scale of 0 (no odor) to 8 (very strong).

The data from that study of recruited volunteers was published as follows:⁹

MEASURE	RESULT
No Odor (0)	40.6%
Very Faint (>0 to <2)	39.9%
Faint/Moderate (>2 to <5)	17.2%
Strong/very strong (5 to 8)	2.3%

⁶ See “The Truth About ... Hog Farms and Asthma” accessed at <http://www.ncpork.org/truth-hog-farms-asthma/>

⁷ Rachel Avery, Steve Wing et al. Archives of Environmental Health, “Odor from Industrial Hog Farming Operations and Mucosal Immune Function in Neighbors (Feb 2004).

⁸ Wing did disclose that “information about environmental health and environmental justice was offered to (study) participants throughout the project—during recruitment, training sessions, and data collection. During initial meetings, the research team shared information about pollutants produced by industrial hog operations and the social and economic consequences of vertically integrated agriculture.

⁹ Steve Wing et al. Environmental Health Perspectives. “Air Pollution and Odor in Communities Near Industrial Swine Operations.” (Oct. 2008).

As shown, odor as measured by the recruited parties, was not frequent and was not strong, with four of the highest-measuring categories – and fully half of all the measured categories – collapsed into one result, which was itself a very low result. (It was not explained why there was not a designated category with “2” as a measure.)

Lastly, it should be noted that, unfortunately, national class-action lawyers seeking to make money have organized roughly 500 residents living near multiple farms in multiple counties into a coordinated and divisive attack against our industry. These law firms have significant financial resources to pursue the cases. In each, none of the plaintiff residents have claimed health injuries or seek relief for medical treatments, property devaluation, nor any effects to drinking water and/or well water. The cases are only now beginning to receive review in the appellate court.¹⁰

¹⁰ See Opinion In re: Murphy-Brown LLC ... “The mischief of the trial court’s action should be apparent” ... (Oct. 29, 2018) at <https://law.justia.com/cases/federal/appellate-courts/ca4/18-1762/18-1762-2018-10-29.html> and also see Dan Fisher, Legal News, “This is Wrong: 4th Circuit Rips Gag Order...” (Sept. 27, 2018)