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Dear Dr. Watkins:

My staff and I reviewed the findings in The Florida Department of Health (FDH) report entitled "Acreage Cancer Review, Palm Beach County, August 2009". Our review supports the conclusions made by the FDH. Denominator data should be addressed and more current population estimates by age group determined. In addition, brain cancer types should be further described and alternate study design explored.

Enclosed is our full review of the FDH report. For any additional information or questions about this review, please contact my office at 770-488-3400.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Michael McGeehin".

Michael McGeehin, PhD, MSPH
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CDC Review of Florida Department of Health Report Acreage Cancer Review — Palm Beach County

I. Introduction

The Centers for Disease Control and Prevention (CDC) received a request from the Florida Department of Health (FDH) to review an investigation report of a possible cancer cluster in an area northwest of Palm Beach known as Acreage. This evaluation is in response to this request.

II. Background

Acreage is located northwest of Palm Beach. This residential area was developed on former citrus groves and agricultural areas and is served by private drinking water wells and septic tanks. Building began in the 1980's and experienced substantial growth between 2001 and 2007. It is estimated that there has been a 38-72% increase in population size since the 2000 US census. An area resident was concerned about what appeared to be an inordinate number of cases of brain cancer and requested that the FDH investigate.

III. Methods

This analysis was a Level I investigation, which does not determine causality but determines if there is a more than expected increase in cancer cases from 1995 to 2007, the period of the analysis. As a part of the investigation, the Florida Cancer Data System (FCDS) was reviewed, the epidemiology of brain cancer was summarized, potential environmental agents were assessed and standardized incidence ratios (SIRs) were calculated. Measurements of environmental agents were not a part of a Level I investigation. However, one International Agency for Research on Cancer (IARC) Group 2B carcinogen, 1,4-Dioxane was noted as a possible contaminant.

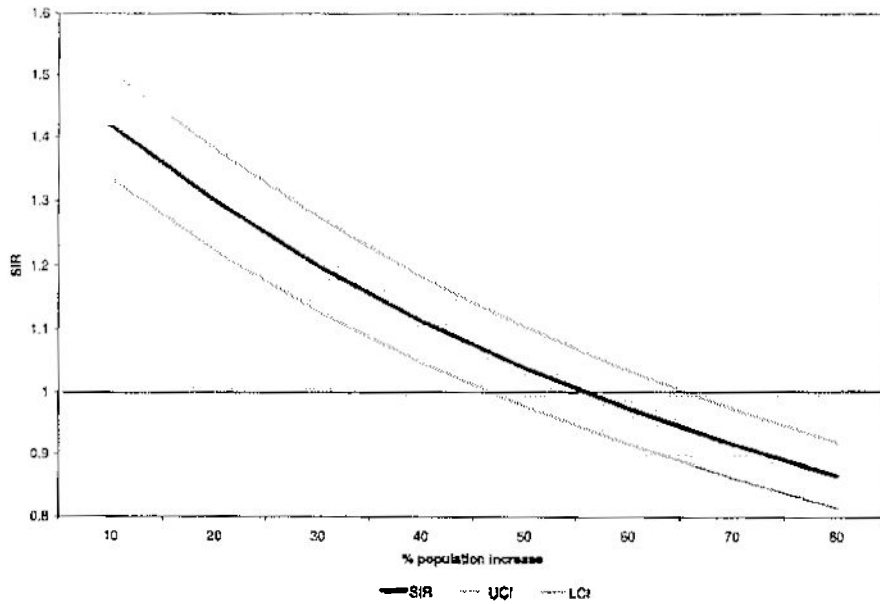
SIR was used to evaluate whether or not there was an elevated risk for brain cancer in this population. First, possible cancer cases were compared to the FCDS and then those that could not be verified were removed from the analysis. For the denominator, the analysis used overall or specific cancer rates for both Florida states and the area surrounding and not including the Acreage. Population size was defined using 2000 US census population for the zip codes that included the Acreage. The complete analysis are drafted in the document 'Acreage Cancer Review: Palm Beach County', a copy of which was provided for this review. A comprehensive list of the limitations to this approach was provided in the report, including small sample size in some subgroup analysis, uncertainty in population size, grouping of all brain cancers together and lack of residence history and other individual level data.

IV. Findings

In light of limitations listed, the use of SIR needs exploring. Although the application of SIRs is appropriate for Level I cancer cluster investigation, it may not accurately assess an excess in cancer cases in this particular situation. Specifically, as noted in the report, there is substantial uncertainty in defining the actual size of the population of the Acreage. The suspect increase would change the value of calculated SIRs towards the null.

As an example of the impact of this change, SIR was calculated for all cases, all cancer from 2000 to 2007 accounting for the increase in the Acreage's population. The calculated SIRs are plotted in Figure 1. This figure demonstrates that, with an increase of about 46% of the population size, the SIR is no longer statistically significant and at around a 56% increase in population size, the SIR equals one. As the estimated population size is 38-72% larger than that reported in the 2000 US Census, there is a large range of potentially relevant SIRs and a considerable possibility that the SIR for the Acreage will not reach statistical significance. Therefore, the SIR is hard to interpret.

Figure1: All cases, all cancer SIR (Standardized Incidence Ratio) and 95% confidence interval by %population increase, Acreage community, Florida 2000-2007



V. Summary

This Level I analysis is thorough and scientific. Based on the amount of uncertainty in the calculation, we concur with the recommendation that denominator data should be addressed and more current population estimates by age group determined. We also concur that brain cancer types should be further described and alternate study design should be explored.

Recommendation for further analysis:

1. In an effort to report an SIR that is closer to the true population size, include SIRs based on population estimates using other non-census data (for example, using estimate % increase based on % increase of school children), in addition to the SIRs already calculated.
2. When accurate age information is available, age adjust SIR by year, in order to compare ratio over time.