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Dr. Hart intended to answer the question of whether or not radon is deadly in Montana. Instead he answered the question, "Do Environmental Protection Agency (EPA) county zone designations correlate to statistically different rates of lung cancer deaths in Montana?" Based on a non-significant student t-test comparing mean cancer mortality for EPA zone 1 and 2 designated counties, Dr. Hart concluded the "notion" that radon is deadly in Montana should be questioned. Dr. Hart's analysis is flawed.

Dr. Hart used the age-adjusted mortality rates from the National Cancer Institute (2010a) but excluded lung cancer deaths for individuals 65 years and older. Excluding data from the full range required justification conceptually, clinically, and analytically. Figure 1 illustrates the Montana counties with non-suppressed cases when the age restriction was removed. In addition, the mortality rates were not adjusted for smoking rate, environmental tobacco smoke, air-pollution particulate matter days, use of wood as a primary indoor heating source, medical sources of ionizing radiation, or access to care—all confounders for a meaningful analysis. I would direct Dr. Hart to the "interpret" link on the National Cancer Institute webpage for their explanation for geographic variations in cancer mortality rates (National Cancer Institute, 2010b). Despite these analytical errors, Dr. Hart does raise an interesting question about the accuracy of the EPA zone designations.

The EPA zone designations were derived from a prediction model based on indoor radon measurements, local geology, aerial radioactivity, soil permeability, and foundation type. Assigning each county into one of three zones for radon potential was a process required by the Indoor Radon Abatement Act of 1988 (EPA 2010). Zone 1 is the highest designation with a predicted indoor radon screening level average of greater than 4 picocuries per liter (pCi/L); the current EPA action level. Zone 2 is defined as moderate potential with an average indoor radon concentration between 2 and 4 pCi/L. Zone 3 is defined as low potential with an average indoor radon concentration less than 2 pCi/L. Forty-nine of

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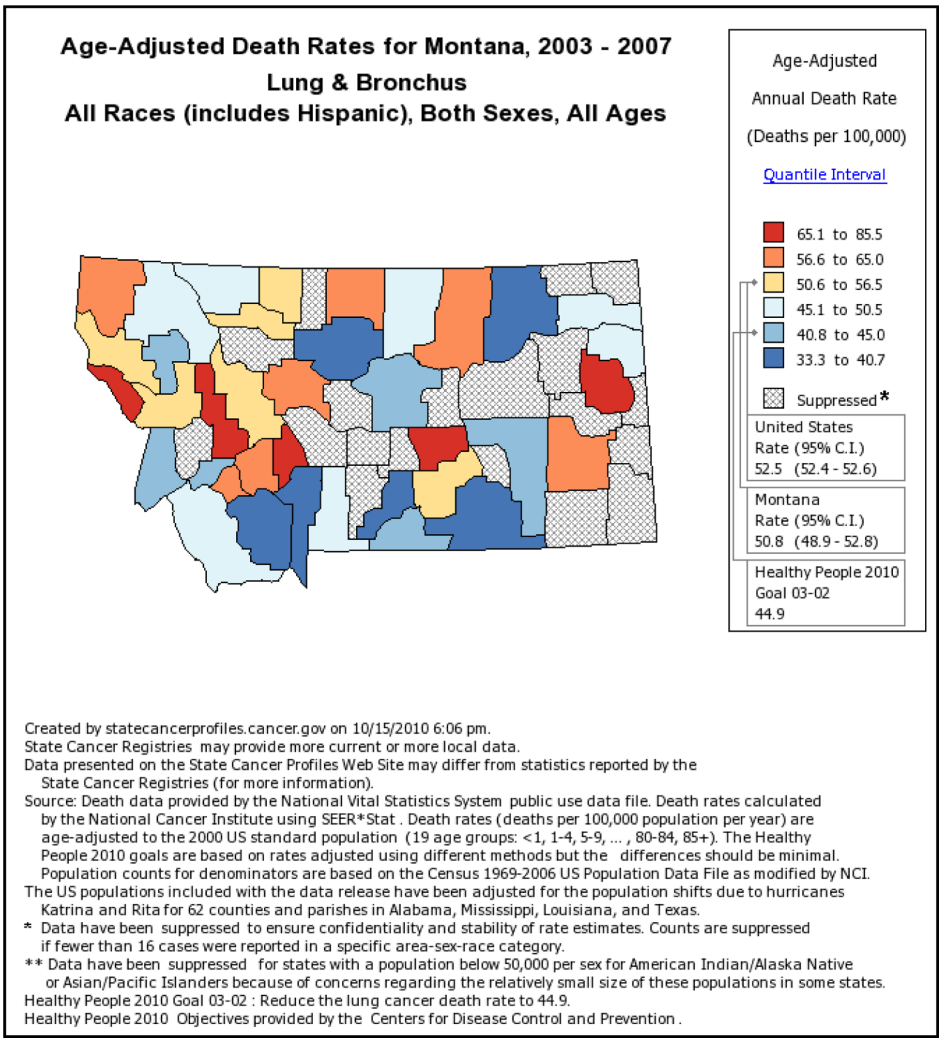

FIG. 1.

Montana's 56 counties are designated as zone 1 and seven are designated as zone 2. Therefore, none of the counties in Montana could be described, as Dr. Hart did, as low radon counties. It is important to note that these designations are guidelines and the U.S. Surgeon General and the EPA recommended that every home should be tested regardless of geographic location (EPA 2010).

The broader issue Dr. Hart engaged was the issue of lung cancer mortality from radon. The President's Cancer Panel (2009) recently reported that the cancer risk attributable to residential radon exposure has been clearly demonstrated and must be better addressed (p. xiv). The Panel recommended the EPA consider lowering its current radon action level. It is noteworthy that the World Health Organization (WHO) recently set

their recommended action level to the equivalent of 2.7 pCi/L (WHO 2009). I would direct Dr. Hart to the list of distinguished references provided by both the President's Cancer Panel as well as the World Health Organization regarding the cumulative evidence in support of their recommendations.

Lung cancer, and potentially leukemia (Smith et al. 2007), skin, stomach, and liver cancers, result from protracted radon exposure (Pawel and Puskin 2003). Lung cancer is now the leading cause of cancer death among American women and radon exposure is the leading cause of lung cancer for people who do not smoke (Centers for Disease Control and Prevention 2010). Reducing preventable radon exposure is a goal common to the Healthy People 2010 (U.S. Department of Health and Human Services 20010b) and 2020 Programs (U.S. Department of Health and Human Services 2010a), WHO (2009), the President's Cancer Panel (2009) and the Montana Cancer Control Coalition (2009). It is time for the allied health-care community to quiet the debate about the carcinogenicity of radon and focus instead on initiatives to reduce or eliminate preventable, unintentional radon exposure.

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