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COMMENTARY ON:

**Climate–Suicide Relationships: A Research Problem in Need of Geographic
Methods and Cross-Disciplinary Perspectives**

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This brief commentary examines the recently published paper by Dixon and Kalkstein (2009): *“Climate-Suicide Relationships: A research problem in need of geographic methods and cross-disciplinary perspectives”*. This paper has the noble goal of attempting to examine the causes associated with seasonal patterns in suicide at different locations. The paper also provides a nice review of the relationship between climatic variables (e.g. temperature, mostly) and suicide, and represents a balanced treatment of the climate-suicide relationships. The paper contributes to the literature by providing this broad overview and balanced treatment of the topic. There are several areas of potential examination, however, that could be expanded in the future. The first is a more detailed review of the literature. There are literally hundreds of research papers examining the seasonality of suicide, so it would be impossible for the authors to examine all of them in a comprehensive manner. However, on the specific topic of the examination of the association between meteorological variables and suicide, there are still some significant papers and topics that the paper misses (e.g. see sample list of a few representative articles below). In addition, potential future directions for the research area, will be discussed below.

The first area that needs additional study is relationship between the seasonal variability of social life and the known seasonal patterns of suicide. For example, previous research not examined by Dixon and Kalkstein shows that there appears to an interesting relationship identified in some countries between sociocultural determinants (e.g. marital status) and the seasonal peak in suicide among females (Lee, et al., 2007; Ajdacic-Gross, et al., 2005). Similarly, in addition to the inclusion of additional variables, there is a need for the expansion of advanced statistical approaches for identifying and quantifying suicide-related variables. Dixon and Kalkstein are correct in pointing out that, "Future research can benefit greatly from assessing the utility of normalization techniques implemented by these prior studies." However, specific examples and descriptions of strengths and weaknesses of improved statistical approaches are lacking. Clearly, an examination of additional variables and the pros and cons of different statistical techniques can produce an improved multi-variate interpretation of the causes of suicide. These variables could include additional meteorological variables such as sunlight or non-meteorological variables. For example, it is well known that suicides increase near some holidays. A non-standard approach, such as logistic regression, which incorporates binary holiday variables might shed additional light onto the seasonality of suicide.

An additional area of future research, as correctly identified by Dixon and Kalkstein, needs to be in trying to develop or assess causal mechanisms. This is important if the developed scientific knowledge is to be used in any kind of decision-making sense by the medical or public health community. For example, the spring spike in suicides suggests that there is some type of a dose-response mechanism, so that, as reported by (Ajdacic-Gross, et al., 2005) "heat (light and so on) enhances susceptibility to suicide and cold (darkness, and so on) smoothens it." They go on to show that, "the association between temperature and suicide is not due to warm temperatures, but is due to mainly the lack of low temperatures." Similarly, the type and nature of the suicide needs to be examined in more detail, as, for example, outdoor-related suicides (e.g. walking in front of a train), are more likely to show a daily temperature-specific relationship than indoor methods. This more detailed characterization of the nuanced relationship between climate and suicide is necessary.

Another area of research not discussed sufficiently in the Dixon and Kalkstein paper concerns the stationarity in the fields under examination. Any historical analysis of the climate/suicide relationship implies both a consistent temporal relationship between the variables, and also a stationarity in the associated fields. For most meteorological variables, this assumption is invalid, as at most locations, there have been noticeable trends in key variables (e.g.

temperature, precipitation). Similarly, a review of the literature shows that there is some evidence that the seasonality in suicide has been decreasing over time. These results could have a wide-ranging significance on any identified relationship between climate and suicide and need to be examined in more detail.

Dixon and Kalkstein write in their abstract that, “almost all of the published climate-suicide research has been conducted by mental health experts with relatively little input from geographers and/or climatologists, thus highlighting the need for future collaborative efforts.” A careful reading of the literature, in fact, illustrates the need for additional statistical sophistication, examination of additional variables, and an improved understanding of the variables used, and, finally, increased efforts to develop causal linkages. Only be these steps can this research be applied and transferred so that can one day it can be used by the public health community to reduce suicides.

Bibliography

Ajdacic-Gross, Vladeta; Lauber, Christoph; Sansossio, Roberto; Bopp, Matthias; Eich, Dominique; Gostynski, Michael; Gutzwiller, Felix and Rössler, Wulf. (2006). “Seasonal associations between weather conditions and suicide—Evidence against a classic hypothesis.” *American Journal of Epidemiology*. 165(5), pp.561-569.

Dreyer, K., 1959: Comparative Suicide statistics II: Death Rates from suicide in Denmark since 1921, and seasonal variations since 1835. *Danish Medical Bulletin*, 6:75-81.

Lee, Hsin-Chien; Lin, Heng-Ching, Tsai, Shang-Ying; Li, Chung-Yi; Chen, Chu-Chieh; Huang, Chung-Chien. (2006). “Suicide rates and the association with climate: A population-based study.” *Journal of Affective Disorders*. 92, pp.221-226.

Lyster, WR., 1973: Seasonal Variations in suicide rates, *Lancet*, 1:725.