Int. J. Biometeor. 1983, vol. 27, nr. 2, pp. 93-105. 0020-7128/83/2702-0093 $ 3.00

A Statistical Investigation into the Relationship between Meteorological Parameters and Suicide

by

Keith W. Dixon and Mark D. Shulman*

ABSTRACT. – Many previous studies of relationships between weather and suicides have been inconclusive and contradictory. This study investigated the relationship between suicide frequency and meteorological conditions in people who are psychologically predisposed to commit suicide. Linear regressions of diurnal temperature change, departure of temperature from the climatic norm, mean daytime sky cover, and the number of hours of precipitation for each day were performed on daily suicide totals using standard computer methods. Statistical analyses of suicide data for days with and without frontal passages were also performed. Days with five or more suicides (clusterdays) were isolated, and their weather parameters compared with those of non-clusterdays. Results show that neither suicide totals nor clusterday occurrence can be predicted using these meteorological parameters, since statistically significant relationships were not found. Although the data hinted that frontal passages and large daily temperature changes may occur on days with above average suicide totals, it was concluded that the influence of the weather parameters used, on the suicide rate, is a minor one, if indeed one exists.

INTRODUCTION

The belief that human emotions are affected by the weather seems to be firmly rooted in our language and heritage. In songs, poems, media weather reports, and everyday conversations, overcast and rainy days are called "gloomy" and "depressing" while sunny and mild weather conditions are referred to as being "pleasant" and "cheerful". Whether meteorological factors could influence a human's mental state to the point of triggering a disturbed person to take his own life is not agreed upon by past researchers. However, one thing that cannot be denied is that suicide is a major cause of death for certain segments of our society. In New York City, suicide is the fourth largest cause of death for people between the ages of 15 and 44 (Department of Health, City of New York, 1979).

* Department of Meteorology and Physical Oceanography Cook College - New Jersey Agricultural Experiment Station Rutgers, The State University of New Jersey, New Brunswick, N.J. 08903, USA
Received 15 March 1982

Statistical research relating suicides and weather conditions were first conducted in the 1930s. Daily suicide data from four Ohio Valley states were compared to a continuous graph of barometric pressure and daily mean temperature departure from the normal by Clarence A. Mills (1934), a Professor of Experimental Medicine at the University of Cincinnati. A distinct relationship between falling barometric pressure and rising suicide incidence was found during the five-year period studied, but the role of temperature was not clear. Economic and social factors were recognized by Mills to be the major cause of suicide, but he felt that the effect of weather, especially falling barometric pressure, was also an important factor in human mental instability.

Two European studies published in the 1930s linked suicide with the Foehn wind phenomena. Rohden (1933) found a significant increase in suicide incidence and crimes in Switzerland when the warm, dry, and often gusty winds of the Foehn effect prevailed. Odewald (1939) published similar findings concerning the relationship between the occurrence of Foehn weather on the lee side of the Alps and suicide incidence.

Tholuck (1942), while at the Institute of Forensic Medicine in Frankfurt, Germany, studied 220 cases of suicide which occurred in 1939. Despite the relatively small sample size, statistically significant correlations existed in connection with warm frontal passages. However, no such relationships were reported for the suicide rate and temperature, humidity, barometric pressure, hours of sunshine, or precipitation. Also, the prevailing political and sociological climate in Germany during this period may have biased Tholuck's results.

Obersteg and Marzetta (1957), and Pokorny, Davis, and Harberson (1963) found no relationships between weather and suicides, possibly due to limited sample sizes. Pokorny studied only 67 suicides and 373 suicide attempts in Houston during 1960 and tried to correlate only actual values for temperature, pressure, etc., not daily ranges or tendencies which, in other studies, have shown the strongest relationships. Obersteg and Marzetta looked at only 261 cases of suicide in Basel, Switzerland from the period 1948-1972. It appeared that a relationship between weather fronts and suicides might exist, but since the sample size was small, more meaningful statistical analyses could not be performed.

Schramm (1968) conducted a study of over 9,000 cases of suicide in West Berlin. No statistically significant relations were reported between suicides and temperature, frontal passages, cloudiness, and some other weather parameters. However, Schramm did note that days which were warmer than the climatic average exhibited a positive deviation in the number of suicides observed, when compared to the average number for that day. Conversely, unusually cool days often showed fewer suicides than would be expected.

Four cities in the Netherlands were studied by Tromp and Bouma (1973) of the Biometeorological Research Centre in Leiden, the Netherlands, for the period 1954-1970. About 9,000 suicides and suicide attempts were analyzed, and 789 clusterdays were observed (days on which an unusually large number of suicide attempts occurred in a city). Tromp and Bouma found that, although the results were not significant when individual meteorological parameters were correlated with suicide attempts, when clusterdays were analyzed a relationship was found. Most clusterdays occurred during periods of drastic temperature change, strong winds and often heavy precipitation, as weather fronts passed through the region. They concluded that weather can have both a psychological and true physiological effect on people predisposed to commit suicide. The physiological effect is probably due to thermoregulatory disturbances caused by