

## SEASONALITY OF SUICIDE IN EASTERN EUROPE: A REJOINDER TO LESTER AND MOKSONY<sup>1</sup>

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*Summary.*—Seasonality of suicide in Hungary decreased from the 1980s to the 1990s, supporting the 2003 conclusion of Lester and Moksony. However, it was the strongest ever to be documented with contemporary suicide data, supporting the conjecture of Voracek, *et al.* (2002) that seasonality of suicide remains high in Eastern Europe. A new hypothesis regarding the co-occurrence of high incidence and strong seasonality of suicide is presented.

Voracek, Vintilă, Fisher, and Yip (2002) reported that seasonality of suicide by hanging in Timiș county, a westerly Romanian area with a noticeable Hungarian minority, had not decreased from 1980–1989, the last decade of the Communist regime, to the transitional period of 1990–1999. In this study, harmonic analysis was used to partition the total variance of the time-series data into seasonal, nonseasonal, and random variance components (Pocock, 1974; Bloomfield, 1976). It was conjectured that seasonality of suicide remains high in Eastern Europe. Seasonality and seasonal harmonics refer to periodic movements within time-series data which have a cyclical basis.

Commenting on Voracek, *et al.* (2002), Lester and Moksony (2003) reported a decrease in seasonality of suicide in Hungary from the 1980s to the 1990s. This conclusion was based on  $\chi^2$  analysis and a descriptive comparison (1980s vs 1990s) of the peak-to-trough difference in aggregated monthly percentages of suicides. Here we show, by appropriate reanalysis, that the conclusion of Lester and Moksony (2003), although correct, was reached by data-analytic methods that are insensitive to seasonality, and thus, the conjecture of Voracek, *et al.* (2002) is still supported. This Rejoinder presents data on suicides in Hungary 1980–1999 ( $N=83,338$ ), as gleaned from the Hungarian Central Statistical Office (KSH) yearbooks. All analyses were conducted using the SAS (v8.02) software.

Harmonic analysis of monthly suicide numbers, adjusted for calendar effects, indicated that for 1980–1989, 83% of the variance was explained by seasonal harmonics, 7% by nonseasonal harmonics, and 10% by random variation. Corresponding figures for 1990–1999 were, in order, 73%, 12%, and 15%. For both periods, the variance accounted for by seasonal harmonics was statistically significant ( $p_s < .001$ ; for test details, see Yip, Chao, & Ho, 1998), whereas the variance accounted for by nonseasonal harmonics and random variation was not. The decrease in seasonality, although statistically reliable ( $p < .05$ ), seems not practically important, since the seasonality still remains very strong in comparison to those of other countries. Within the seasonal harmonics, the one-cycle component's explanatory power even increased, relative to higher-order cycles (1980s: 90% vs 1990s: 98%).

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Lester and Moksony (2003) used no statistical procedure to detect seasonality (cyclical patterns) in time-series data, and instead they examined overall unevenness. Relatedly, the presentation of aggregate monthly percentages and their corresponding peak-to-trough differences for suicide incidence also have no direct bearing on periods and amplitudes of seasonal rhythms embedded in the sequence of time-series data (for discussion, see Hakko, Räsänen, Tiihonen, & Nieminen, 2002).

The exceptionally pronounced seasonality of suicide in Hungary during the 1980s and 1990s is the strongest ever to be documented with contemporary data, exceeding the 66% figure for Japan, 1982–1996, reported by Sato (2001). Due to shared genetic risk factors (Voracek, Fisher, & Marušič, 2003), high incidence of suicide coupled with strong seasonality of suicide may be particularly noteworthy in geographical areas inhabited by the descendants of ancestral populations adapted to cold climates, such as the Japanese, Inuit, Siberian, Samoyed, Uralic, Finnish, Lappish, Baltic, and Hungarian people (Oppenheimer, 2003). This new conjecture remains to be tested. Importantly, the decrease in seasonality of suicide in Hungary occurred concomitantly with a decrease in suicide rate (Rihmer, Appleby, Rihmer, & Belso, 2000), which we view as evidence supporting the hypothesized positive relation between incidence and seasonality of suicide.

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