

Commentary on: Inoue K, Fukunaga T, Okazaki Y. Study of an economic issue as a possible indicator of suicide risk: a discussion of stock prices and suicide. *J Forensic Sci* 2012;57(3):783–5.

Sir,

Inoue et al. (1) demonstrated a connection between worsening economic problems and suicide in Japan from 1984 to 2008 by showing that the level of the Nikkei stock index was associated with the suicide rate. The lower the Nikkei stock index, the higher the suicide rate. The present note explored whether the same phenomenon could be demonstrated in the United States of America.

Data on the Dow Jones Industrial Average (DJIA) at the end of each year were obtained from 1950 to 2000 from finance.yahoo.com/q/hp?s=DJI+Historical+Prices. Suicide rates were obtained from Lester and Yang (2) for 1950–1985, from <http://www.who.int> for 1986 to 1989, and from the American Association of Suicidology (<http://www.suicidology.org>) for 1990–present.

Inoue et al. (1) correlated the Nikkei Stock Average at the end of the year with the suicide rate in that year for the period 1984–2008. For the United States, the Pearson's correlation for the period 1984–2008 between the DJIA at the end of the year and the suicide rate that year was -0.91 ($p < 0.001$), that is, the higher the DJIA, the lower the suicide rate. It was noted that the DJIA increased over this time period ($r = 0.93$), while the suicide rate declined over this time period ($r = -0.82$). Correlating the DJIA at the end of the year with the suicide rate the following year resulted in a similarly strong association ($r = -0.81$).

The absolute value of a stock index is only one possible measure of economic conditions. The percent change in the stock index from year to year might also be a useful measure of the economic state of the nation. The correlation between the percent change in the DJIA each year and the suicide rate was, however, only 0.12 and not statistically different from zero (The correlation between the absolute value of the change in the DJIA and the suicide rate was also not significantly different from zero: -0.13).

However, the results were different when the variables were correlated over the longer period, 1950–2008. For this longer period, the correlation between the Dow Jones Industrial Index and the suicide rate was -0.06 . Thus, the positive association between stock price indexes and the suicide rate may depend critically on the period of time chosen for analysis.

An alternative measure of economic conditions to the stock index is the unemployment rate. The correlation between the unemployment rate each year with the suicide rate in the United States for the period 1950–2008 was 0.65 ($p < 0.001$), indicating that the higher the unemployment rate, the higher the suicide rate. For the period studied by Inoue et al. (1), 1984–2008, the correlation between the unemployment rate and the suicide rate was also positive ($r = 0.69$, $p < 0.001$). Thus, for the United States, unemployment was a more consistent correlate of the suicide rate.

Lester and Yang (3) analyzed three theories of the relationship between the economy and suicide. Henry and Short (4) focused on the changes in the relative status of people from the different social classes as the economy improves or worsens and proposed a

countercyclical theory, that is, as the economy improves, the suicide rate will decline. Ginsberg (5) focused on the aspirations of people as the economy changes and proposed a procyclical theory, that is, as the economy improves, the suicide rate will rise. Durkheim (6) focused on the impact of an improving and a worsening economy on anomie and predicted that both booms and busts will result in an increased suicide rate, generating a U-shaped relationship. The results of this study in the United States and that of Inoue et al. in Japan, support Henry and Short's countercyclical theory. As the economy worsens, suicide rates will rise.

The results of the present analysis indicate that there may be cultural differences in comparing Japan and the United States. Kameyama et al. (7) documented suicides in Japan precipitated by unmanageable debt, debt caused primarily by debt repayment problems rather than by low income. There have been no similar reports of suicides in the United States caused by unmanageable debt, and so perhaps the reaction of individuals to debt differs in the two cultures. Furthermore, coguarantor borrowing is common in Japan. For small and medium borrowing, when there is no collateral, people who want to borrow money often have a friend or relative cosign and become jointly liable for the full debt amount. If the borrower cannot repay the debt, he or she sometimes feel such shame for imposing a burden on the cosigner for the debt that he or she commits suicide. Chen et al. (8) studied a small sample of suicides by self-employed individuals in Japan and found that 33% (17 people of 52) committed suicide because of coguarantor problems.

Debt may be less often a precipitating cause of suicide in the United States. In the United States, unemployment, with the resulting economic hardship created by being unemployed, may be a more common precipitant for suicide.

References

- Inoue K, Fukunaga T, Okazaki Y. Study of an economic issue as a possible indicator of suicide risk: a discussion of stock prices and suicide. *J Forensic Sci* 2012;57(3):783–5.
- Lester D, Yang B. Suicide and homicide in the 20th century. Commack, NY: Nova Science, 1998.
- Lester D, Yang B. The economy and suicide. Commack, NY: Nova Science, 1997.
- Henry AF, Short JF. Suicide and homicide. New York, NY: Free Press, 1954.
- Ginsberg RB. Anomie and aspirations. Dissertation Abstracts. New York, NY: Columbia University, 1996;27A:3945–6.
- Durkheim E. *Le suicide*. Paris, France: Felix Alcan, 1897.
- Kaneyama A, Matsumoto T, Katsumata Y, Akazawa M, Kitani M, Hirokawa S, et al. Psychosocial and psychiatric aspects of suicide completers with unmanageable debt. *Psychiatry Clin Neurosci* 2011;65:592–5.
- Chen J, Choi YJ, Sawada Y. Joint liability borrowing and suicide. *Econ Lett* 2010;109:69–71.

David Lester,¹ Ph.D. and Bijou Yang,² Ph.D.

¹Department of Psychology, The Richard Stockton College of New Jersey, Galloway, NJ 08205.

²Department of Economics & International Business, Drexel University, Philadelphia, PA 19104.

E-mail: lesterd@stockton.edu