

## Suicide in Poland: a cross-national perspective

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*Recent epidemiological trends in Polish suicide rates were compared and found to be somewhat consistent with world-wide trends. In addition, the time-series Polish suicide rate was consistent with some predictions made from Durkheim's classic theory of suicide. Finally, hypotheses about the etiology of suicide were used to derive a linear regression equation to predict the Polish suicide rate reasonably accurately.*

*Key words:* suicide, suicide rate, epidemiological trends, prediction

The task addressed in this article is a comparative analysis of the epidemiology of suicide in Poland by contrasting the suicide rate in Poland (and its changes over the years) with the suicide rates of other nations of the world. In addition, an attempt will be made to predict the Polish suicide rate using a regression equation based on five social indicators derived from a sample of other European nations.

### The Epidemiology Of Suicide In Poland And The World

Polish suicide rates from 1954 to 1995 are shown in Tables 1 and 2. Poland has shown epidemiological trends in suicide rates in recent years similar to those in other nations. From 1970 to 1984, Poland experienced an increase in the suicide rate of men (from 18.8 per 100,000 per year to 23.6) as did 21 of 23 nations studied by Lester [10], and an increase in the suicide rate of women (from 4.0 to 4.9) as did 14 of the 23 nations. Nations with higher suicide rates in 1970 experienced a larger absolute increase from 1970 to 1980, and Poland was consistent with this trend [7].

There has been concern recently over rising elderly suicide rates. From 1970 to 1980, Lester [13] found rising elderly suicide rates for men in 17 of 28 nations studied and in 15 of the nations for women. In Poland from 1970 to 1979, the suicide rate for those 75 years of age and older rose by 27.1% men but decreased by 27.9% in women. Thus, Poland's trends in elderly suicide rates were quite similar to those of most nations in the world for men.

The 1970s witnessed rising suicide rates among youth. From 1970 to 1980, Lester [8] found that 23 of 29 nations studied experienced a rise in youth suicide rates. In

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line with this, the suicide rate of Polish youth aged 15-24 increased by 15.0% during this period, though the overall Polish suicide rate also rose 13.4%.

Looking at more recent trends, Lester [17] found that, from 1960-1990, 27 of 35 nations experienced an increasing suicide rate, 24 significantly so, including Poland. Lester also looked for quadratic trends, and found that 14 nations had suicide rates which peaked during the 30-year period (inverted U-shaped curves), nine significantly so, including Poland. (In contrast, twenty-one nations had U-shaped curves for the period, twelve significantly so.) Lester [16] noted that male and female suicide rates rose less often in nations of the world in the 1980s than in the 1970s (in only 18 of 31 nations examined for male suicide rates and in only 9 of 31 nations for women). In Poland during the 1980s, the male and female suicide rates remained quite stable — the male suicide rate rising only from 21.8 in 1979 to 22.0 in 1990 and the female suicide rate rising only from 4.0 to 4.5. Analyses of world-wide trends in the 1990s have not yet appeared.

Using multiple regression analyses, Lester [15] found that suicide rates in Poland from 1955 to 1985 were significantly associated with higher divorce rates and lower birth rates as predicted from Durkheim's [1] classic theory of suicide. However, higher suicide rates were associated with higher marriage rates (though not significantly so) in opposition to Durkheim's theory.

### **Predicting The Polish Suicide Rate**

A number of studies have appeared in recent years examining social correlates of national suicide rates. It is of interest to inquire, therefore, whether the results of this research could be used to identify a set of social variables which can predict the Polish suicide rate. To do this, we must first briefly review theories of suicide in order to identify possible predictor variables.

### **Physiological Theories**

One possible explanation, of course, for differences in the suicide rates of nations could be that different nationalities differ in some relevant manner in their physiology. Perhaps, for example, there are differences in inherited psychiatric disorders, particularly affective disorders, or brain concentrations of serotonin, the neurotransmitter believed to be responsible for depression?

Lester [6] studied the associations between the proportions of people in 17 industrialized nations with the different types of blood (O, A, B and AB) and the nations' suicide rates. He found that, the lower the proportion of Type O people and the higher the proportion of Type AB people, the higher the suicide rate.

Mawson and Jacobs [19] noted that the synthesis of the neurotransmitter serotonin (believed to contribute to people's level of depression) by the body requires the precursor amino acid L-tryptophan. Corn has less L-tryptophan as compared to other cereals, and so nations with a higher corn consumption would get less L-tryptophan, and so might have lower levels of serotonin. Lester [5], however, in a study of 38 nations,

found no association between per capita consumption of corn and suicide rates. Kitahara [3,4] estimated the levels of tryptophan in the blood relative to other amino acids (such as tyrosine) from dietary intake in residents of nations. He found no associations in a large sample of nations (a result replicated by Lester [1989]).

### **Psychological And Psychiatric Theories**

The major psychological and psychiatric factors found to be associated with and predictive of suicidal behavior are depression (in particular hopelessness) and psychological disturbance, labeled variously as neuroticism, anxiety, or emotional instability [11]. Psychiatric disorder of any kind appears to increase the risk of suicide, with affective disorders and substance abuse leading the list.

Alcohol abuse and drug abuse are strongly linked with suicidal behavior. Not only are these behaviors seen as self-destructive in themselves (Menninger [20] called them chronic suicide), but both attempted and completed suicide occur at high rates in substance abusers [12].

### **Composition Theories**

Moksony [21] has noted that one simple explanation of differences in suicide rates between nations is that the national populations differ in the proportion of those at risk for suicide. For example, typically in developed nations, suicide rates are highest in the elderly. Therefore, nations with a higher proportion of the elderly will have a higher suicide rate.

### **Social Theories**

The most popular explanations of social suicide rates focus on social variables. These social variables may be viewed in two ways: (1) as direct causal agents of the suicidal behavior, or (2) as indices of broader, more abstract, social characteristics which differ between nations.

The most important theory for choosing relevant variables is that of Durkheim [1]. Durkheim hypothesized that suicide rates were caused by the society's level of social integration (that is, the degree to which the people are bound together in social networks) and the level of social regulation (that is, the degree to which people's desires and emotions are regulated by societal norms and customs). Durkheim thought that this association was curvilinear, but later sociologists have suggested that the association is linear in modern societies [2], with suicide increasing as social integration and regulation decrease. Studies of samples of nations have found that suicide rates are associated with such variables as the birth rate, female participation in the labor force, immigration, and the divorce rate [24,25,26]. Some investigators see these associations as suggesting a direct link between divorce or immigration and suicidal behavior. For example, divorce may be associated with suicide at the aggregate level because divorced people have a higher suicide rate than those with other marital statuses. Other inves-

tigators see the associations as suggesting that divorce and immigration are measures of a broader and more basic social characteristic, perhaps social integration, which plays a causal role in suicide. In this latter case, nations with a higher rate of divorce may have a higher rate of suicide for those in all marital statuses.

In a study of 25 nations in 1970, Lester [14] found that suicide rates were associated positively with the percentage of the elderly, the divorce rate and the gross domestic product, and negatively with the percentage of people under the age of 15, the unemployment rate and the birth rate. The association of suicide with birth and divorce rates is consistent with predictions from Durkheim's theory, the association with the percentage of elderly and young is consistent with a composition explanation of the suicide rate, and the association with unemployment and gross domestic product is consistent with previous research findings [23, 25].

### **Predicting The Polish Suicide Rate**

This brief review of physiological, psychological, sociological and compositional theories of suicide rates has identified a number of variables which ought theoretically to be associated with suicide rates or which have been found empirically to correlate with suicide rates. As a test of the utility of these variables, a set of these variables was tested for their ability to predict the suicide rates of a sample of developed nations with available data. Then, the regression equation so identified was examined for its ability to predict the Polish suicide rate.

The variables chosen, together with their theoretical source, were: blood type (physiological), alcohol consumption (psychological), percentage of the elderly (compositional), and divorce and birth rates (sociological). The sample used consisted of 18 industrialized nations first used by Lynn [18] in a study of national character. Data on blood types were available for 17 of these, and the present analysis restricted the sample to these 17 nations.<sup>2</sup> The multiple linear regression equation was derived from these 17 nations and then the Polish suicide rate was predicted from this regression equation. The results of the multiple regression analysis are shown in Table 3, together with the predicted suicide rate for Poland when the values for the Polish predictor variables are substituted into the regression equation.<sup>3</sup> It can be seen that the Polish suicide rate was predicted reasonably accurately, 162 per million per year in 1980 as compared to the actual suicide rate of 127 per million per year.

To explore the accuracy of the predicted suicide further, the same regression equation was used to predict the suicide rates in 1980 of Bulgaria, Czechoslovakia, Hungary and Yugoslavia. The results are shown in Table 4, where it can be seen that the Spearman rank order correlation coefficient for the association between the predicted and actual suicide rates was 0.90 (one-tailed  $p = .05$ ), indicating that the regression equation is

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<sup>2</sup> Australia, Austria, Belgium, Canada, Denmark, Finland, France, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, the United Kingdom, the United States and West Germany. Data on blood type were not available for Switzerland

<sup>3</sup> Blood type data were obtained from Mourant, et al. (1976).

reasonably good in predicting the suicide rates of this small sample of nations in the correct rank order.

### Discussion

Recent epidemiological trends in the Polish suicide rate, such as decreasing elderly suicide rates, were seen to be somewhat consistent with trends in other nations of the world. An examination of the time-series Polish suicide rate indicated that it was consistent with Durkheim's classic theory of suicide which predicts associations between suicide rates and measures of social integration, such as divorce and birth rates.

Finally, a review of the major perspectives on and predictors of suicide, both at the individual level and at the societal level, identified several possible correlates of national suicide rates. As an exercise, the Polish suicide rate, as well as the suicide rates of other formerly-Communist nations, was predicted reasonably accurately based on a multiple regression equation derived from data from 17 industrialized nations.

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## TABLES

Table1

**Polish Suicide Rates per 100 000 per year**  
**(from World Health Organization data supplemented by Dr. Brunon Holyst)**

	total	male	female
1954	5.4		
1955	5.7	9.6	2.2
1956	5.6	9.0	2.4
1957	5.9	9.5	2.5
1958	6.1	10.3	2.2
1959	6.8	11.2	2.6
1960	8.0	13.4	2.9
1961	8.8	14.7	3.3
1962	9.3	15.3	3.7
1963	8.4	14.2	3.0
1964	8.5	13.9	3.4
1965	9.0	14.9	3.4
1966	9.9	16.7	3.3
1967	10.2	17.3	3.6
1968	10.6	17.9	3.7
1969	11.2	18.6	4.2
1970	11.2	18.8	4.0
1971	11.7	19.7	4.1
1972	12.0	20.3	4.1
1973	11.7	19.4	4.3
1974	11.3	18.7	4.2
1975	11.3	19.3	3.7
1976	12.1	20.6	4.0
1977	12.4	21.1	4.1
1978	13.3	22.8	4.2
1979	12.7	21.8	4.0
1980	10.7	-	-
1981	11.3	-	-
1982	11.8	-	-
1983	12.4	-	-
1984	14.0	23.6	4.9
1985	13.3	22.6	4.5
1986	12.6	22.0	4.4
1987	13.3	22.3	4.7
1988	12.2	20.5	4.3
1989	11.3	19.3	3.7
1990	13.0	22.0	4.5
1991	13.9	23.9	4.4
1992	14.9	25.3	5.0
1993	14.6	24.8	5.0
1994	14.3	24.7	4.5
1995	14.3	24.3	4.7

## Polish Suicide Rates by Age, 1960–1990

	males							females						
	15-24	25-34	35-44	45-54	55-64	65-74	75+	15-24	25-34	35-44	45-54	55-64	65-74	
75+														
Poland														
1960	13.7	21.0	22.3	26.1	21.5	19.2	23.1	3.4	3.2	3.4	6.0	6.4	3.7	3.9
1961	14.8	23.9	23.9	27.6	25.9	21.3	15.6	3.0	3.6	4.8	7.2	5.8	5.5	4.6
1962	14.5	23.3	25.7	28.5	29.5	19.7	20.6	4.4	3.8	4.6	7.8	7.0	4.5	7.6
1963	11.1	20.7	27.4	26.8	24.9	21.3	19.9	2.7	3.2	4.4	5.5	6.4	4.8	2.7
1964	11.2	20.1	24.3	25.1	28.5	21.0	21.6	3.6	2.8	4.5	6.8	6.4	6.0	7.7
1965	12.3	21.1	25.6	28.8	26.3	25.0	19.5	3.6	3.6	3.9	6.2	6.7	5.8	6.4
1966	13.5	22.6	31.3	31.4	28.9	23.4	23.3	3.7	3.6	4.4	6.4	5.1	6.2	6.1
1967	13.3	24.2	30.8	31.1	30.2	24.9	22.4	3.7	3.2	4.7	6.4	7.0	5.9	5.8
1968	13.6	22.8	31.5	35.3	32.9	24.1	26.9	4.3	4.0	4.7	6.7	5.7	5.2	6.9
1969	15.7	24.3	31.7	35.1	32.5	23.5	18.9	4.2	4.2	5.4	7.8	6.1	7.1	7.6
1970	15.6	24.7	32.4	31.6	32.3	27.7	21.7	3.3	4.5	4.9	7.0	7.5	6.5	6.8
1971	18.7	26.2	29.1	35.9	32.3	27.5	21.8	4.0	4.4	4.7	6.6	7.3	7.0	6.4
1972	19.4	27.1	30.8	33.2	34.4	27.0	25.8	4.1	4.3	5.1	6.8	6.8	7.4	5.4
1973	18.1	24.8	30.3	32.5	32.3	27.5	29.8	3.6	4.7	6.3	7.8	7.2	6.0	5.3
1974	16.6	24.4	26.8	33.2	30.3	26.7	24.8	4.0	3.7	5.1	6.6	6.8	7.5	8.8
1975	17.3	25.0	28.9	35.2	29.5	25.8	23.7	3.6	4.0	4.5	5.7	6.9	5.8	5.0
1976	18.1	26.4	31.0	35.7	35.7	27.6	20.0	3.6	3.1	5.4	7.4	8.0	6.1	5.1
1977	18.0	26.3	32.3	37.6	34.1	28.5	27.0	4.4	3.5	5.3	6.8	7.2	5.7	5.2
1978	20.4	21.3	34.0	38.6	35.0	26.7	29.8	4.5	3.7	5.0	7.8	6.4	6.4	5.5
1979	19.5	29.5	35.4	37.7	30.2	23.6	27.6	4.3	3.8	5.7	6.5	6.0	6.4	4.9
1980														
1981														
1982														
1983	18.8	31.7	31.3	32.9	28.7	25.4	23.8	4.5	5.4	5.0	6.5	6.0	6.9	6.1
1984	18.2	36.3	37.0	39.0	31.2	29.1	29.7	3.8	5.7	6.6	8.3	8.0	7.5	6.4
1985	17.9	32.7	34.6	38.5	33.9	27.7	30.1	3.2	5.1	5.8	8.0	8.0	5.5	7.1
1986	17.5	29.3	33.5	36.7	35.9	30.6	29.3	2.7	5.3	5.8	8.4	7.6	6.6	5.5
1987	17.8	30.6	32.3	38.5	35.0	29.9	33.2	3.0	5.7	6.4	8.0	7.7	7.7	6.9
1988	14.5	28.9	30.6	36.5	30.7	29.0	31.6	2.4	5.0	5.8	7.6	7.3	7.1	6.9
1989	14.5	26.4	29.5	33.2	30.3	25.8	29.6	2.8	3.6	5.0	5.9	6.5	6.0	7.2
1990	16.2	30.4	33.0	38.4	36.3	28.0	27.3	2.8	4.3	6.0	7.4	8.7	7.2	7.4



Table 3  
Results of the multiple regression analysis and the prediction of the Polish suicide rate

	b coefficient	Polish raw score*	contribution to the Polish suicide rate
birth rate	-0,1767	195	-34,65
divorce rate	0,0727	112	8,14
alcohol consumption	0,0566	823	46,58
%elderly	0,4294	101	43,37
blood type	-0,5978	367	-219,39
constant	317,9696		317,97

multiple R: 0.69

predicted Polish suicide rate: 162 per one million per year

actual Polish suicide rate: 127 per one million per year

\* decimal points were omitted in the analysis

Table 4  
The predicted and actual suicides rates for several European Nations in 1980

	predicted	rank order	actual	rank order
Bulgaria	209	3	139	4
Czechoslovakia	216	2	198	2
Hungary	265	1	450	1
Poland	262	5	127	5
Yugoslavia	178	4	148	3

