Schizophrenia Prevalence: Wheat, Milk and Temperature

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Abstract

Schizophrenia prevalence was found to be positively associated with milk and wheat consumption and negatively associated with July temperature with data from 18 countries. These findings were predicted and mesh with previous research.

Torrey and co-researchers, in a series of articles (Torrey, 1973; Torrey, Torrey, and Burton-Bradley, 1974; Torrey and Peterson, 1976; Torrey, 1979), presented evidence directed to the contention that schizophrenia prevalence is not uniform throughout the world, but is related to geographic and temporal variables in a disease-like fashion. The variables studied in the present research are per capita wheat consumption, per capita milk consumption, temperature, population density, and per capita income.

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It has been reported that persons with celiac disease, which is made worse by wheat gluten, often have schizophrenic like symptoms; and it has been demonstrated that the incidence of celiac disease is high in schizophrenia (Dohan, 1969). Schizophrenics placed on wheat free and milk free diets have shown considerable improvement (Dohan, Grasberger, Lowell, Johnston, and Arbegast, 1969; Dohan and Grasberger, 1973; Singh and Kay, 1979). During World War II in Europe there was a high inverse relationship between per capita wheat consumption and schizophrenic admission rates (Dohan, 1966). Intracerebral injection of wheat gliadin produced "catalepsy" and "chewing in air" in rats (Dohan, 1978).

In an article by Torrey (1979) a pictorial map presents localities believed to have especially high or low prevalences of schizophrenia. It was the present authors' impression gained from this map that the high prevalence countries are colder. Furthermore, schizophrenics tend to be born in the colder months of the year and this tendency is significantly greater in colder climates (Templer, 1978).

We were able to obtain the schizophrenia prevalence for 18 countries — Argentina,

Australia, Canada, Denmark, Finland, India, Ireland, Japan, Norway, Papua New Guinea, South Korea, Sweden, Sri Lanka, Taiwan, United Kingdom, United States, West Germany, and Yugoslavia. For 77 of these countries, the prevalence figures are in one or both, of two tables (Torrey, in press, Bellak, 1969). Papua New Guinea was calculated from another article (Torrey, Torrey, and Burton-Bradley, 1974). When more than one prevalence figure was given for any country, the figures were averaged. Per capita wheat and milk consumptions were obtained from the U.S. Department of Agriculture. The other independent variables were obtained from encyclopedic sources. For temperature, the average January and July temperatures of the largest city were used. (For the Southern hemisphere countries, July and January were regarded as the corresponding winter and summer months.)

Table 1

SCHIZOPHRENIA PREVALENCE, WHEAT AND MRX CONSUMPTION, TEMPERATURE, POPULATION DENSITY, AND INCOME

COUNTRY	SCHIZOPHRENIA PREVALENCE	WHEAT CONSUMPTION	MUX CONSUMPTION	WINTER TEMPERATURE	SUMMER TEMPERATURE	POPULATION DENSITY	INCOME
Argentina	1.1	127.6	132.1	48	75	25.2	$2,039
Australia	4.4	73.5	253.7	54	70	4.9	$7,712
Canada	3.1	79.1	247.2	16	71	6.3	$9,039
Denmark	2.2	55.5	337.8	32	63	309.8	$10,613
Finland	4.3	66.1	619.3	22	64	38.6	$7,650
India	4.6	44.6	39.2	67	85	520.0	$167
Ireland	7.1	112.6	425.2	41	59	121.4	$3,886
Japan	2.9	49.5	70.8	37	77	822.7	$8,182
Norway	5.3	81.3	495.1	25	64	33.0	$9,767
Papua New Guinea	.1	2.6	3.3	73	83	17.2	$555
South Korea	3.8	42.8	6.6	23	77	1048.6	$1,559
Sweden	5.8	66.2	343.5	28	63	48.0	$10,520
Sri Lanka	4.5	47.1	40.0	79	81	573.9	$179
Taiwan	1.7	52.0	10.0	59	84	1254.8	$1,460
United Kingdom	3.8	93.3	292.0	39	63	591.3	$5,757
United States	3.2	73.0	233.9	30	73	61.2	$10,587
West Germany	2.3	68.8	125.8	28	64	642.9	$11,015
Yugoslavia	5.2	197.0	215.0	32	72	224.9	$2,517

Table 1 contains schizophrenia prevalence per 1000 persons, yearly per capita wheat consumption in kilograms, yearly per capita milk consumption in pounds, average mid-winter and mid-summer Fahrenheit temperatures of the largest city, persons per square mile, and income.

The product moment correlation coefficient with schizophrenia prevalence is .38 (p=.06) for wheat consumption, .53 (p=.01) for milk consumption, -.24 for January temperature, -.46 (p=.03) for July temperature, -.19 for population density, and .11 for income. The multiple R using wheat and milk consumption as the independent variables is .57 (p=.05). The other independent variables did not add significantly to the multiple correlation.

Although correlation does not equal causation, these correlations do agree with the above cited literature relating schizophrenia to wheat and milk consumption.

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References

BELLAK. L. and LOEB, L: The Schizophrenic Syndrome. Grune and Strat-ton. New York, 1969.

OOHAN, F.C.: Abnormal Behavior after Intracerebral Injection of Polypep-tides from Wheat Gliadin. Pavlov J. Biol. Sci. 1978; 13:73-82.

DOHAN, F.C.: Cereals and Schizophrenia: Data and Hypothesis. Acta Psy-chiatrica Scandinavica 1966; 42:125-152.

DOHAN, F.C.: Schizophrenia's Possible Relationship to Cereal Grains and Celiac Disease. In: Siva Sanker OV (Ed.): Schizophrenia — Current Concepts and Research. P.J.D. Publications, Hicksville, New York, 1969.

DOHAN, F.C. and GRASBERGER, J.C.: Relapsed Schizophrenics: Earlier Discharge from the Hospital after Cereal-free, Milk-free Diet. Amer. J. Psychiat. 1973; 130:685-688.

DOHAN, F.C, GRASBERGER, J., LOWELL, F., JOHNSTON. R, and ARBEGAST, A.: Relapsed Schizophrenics: More Rapid Improvement on a Milk and Cereal Free Diet. Amer. J. Psychiat 1969; 115:595-596.

SINGH, M.M. and KAY, S.R.: Wheat Gluten as a Pathological Factor in Schizophrenia. Science 1979; 191:400-401.

TEMPLER, D.I.: Month of Conception and Birth of Schizophrenics as Related to the Temperature. J. Orthomolecular Psychiat. 1978; 7:231-235.

TORREY, E.F.: Civilization and Schizophrenia. Aronson, New York, in press.

TORREY, E.F.:. Is Schizophrenia Universal? An Open Question. Schizophrenia Bull. 1973; 7:53-59.

TORREY, E.F.: Tracking the Causes of Madness. Psychology Today 1979; 12:78-80.

TORREY, E.F. and PETERSON, M.R.: The Viral Hypothesis of Schizophrenia. Schizophrenia Bull. 1976; 2:136-146.

TORREY. E.F., TORREY, B.B., and BURTON-BRADLEY, B.G.: The Epidemiology of Schizophrenia in Papua New Guinea. Amer. J. Psychiat 1974;131:567-573.