A NOTE ON PREDICTING MANPOWER RESOURCES FROM HEALTH AND EDUCATIONAL DATA

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BECAUSE of the marked relationship that exists between variations in quality of present manpower resources among States and data for health and education obtainable a decade ago, it may be possible to estimate the quality of manpower which will be available by States a decade from now. The purpose of this paper is to show that the relative unavailability of manpower among the forty-eight States, as reflected in Selective Service rejection rates for the period from July, 1950, to April, 1952, could have been predicted with some accuracy on the basis of the statistics of 1940.

The variable to be predicted was the pre-induction examination rejection rate by States as given by General Hershey.[2] Predictor variables were selected on the basis of potential relevance to the physical and mental components entering into rejection for service. These variables were, respectively, the age-adjusted mortality index for 1940 as computed by the National Office of Vital Statistics,[3] and the 1939–1940 expenditures per pupil in average daily attendance in full-time public elementary and secondard schools.[4]

The relationship between rejection rate and each of the selected predictor variables is substantial. The Pearson coefficient between rejection rate and age-adjusted mortality index is 0.727; between rejection rate and per capita expenditure for education, –0.682. In other words, the higher the

[1] National Institute of Mental Health.

[2] Data from Table 3, "Armed Forces Preinduction Examination and Induction Inspection Rejection Rates for Selective Service Registrants, by States." Statement of Major General Lewis B. Hershey before the Interstate and Foreign Commerce Committee of the House of Representatives on H. Con. Res. 19, June 9, 1952.

[3] Age-Adjusted Death Rates in the United States, 1900 to 1940. *Vital Statistics —Special Reports,* Volume 23, No. 1, March 12, 1948.

[4] Table XIV, Column 5. Current expenditure (excluding interest) per pupil in average daily attendance in full-time public elementary and secondary schools, by State, for specified years. STATISTICS OF STATE SCHOOL SYSTEMS, 1949–50. Federal Security Agency, Office of Education.

mortality index and/or the less spent for education, the higher is the rejection rate ten years later.

Of considerable surprise is the relatively low correlation between mortality index and the educational data: –0.256. Although the reasons why this coefficient is not higher are matters for speculation, the relative independence of these two predictor variables indicates that they are to be used additively in predicting rejection rate. The multiple coefficient of correlation between (1) rejection rate and (2) mortality index and educational expenditures, taken together, is 0.889. The prediction formula for the data at hand is:

$$X_c = 5.11X_1 - 0.19X_2 - 3.61$$

where

X_c is the rejection rate in 1950–1952.

X_1 is the age-adjusted mortality index in 1940.

X_2 is the per capita expenditure for education in 1939–1940.

The accompanying table presents for comparison both the computed rejection rate for the forty-eight States and the rejection rate actually observed in the twenty-two months following the outbreak of hostilities in Korea. A similar prediction formula and table may readily be developed from the educational data and vital statistics now available for 1950 provided continuance of the basic relationships to rejection rate is assumed.

It should be noted that the relationship which has been observed is concerned with *relative* rates of rejection by States and not absolute rates of rejection. Absolute rates are dependent upon over-all standards of acceptance and the availability of manpower at a particular time. The magnitude of criterion figures employed in this study was influenced by (1) the pool of older men previously rejected for service in World War II but eligible for reinspection in the months immediately following the outbreak of hostilities in Korea, and (2) the reduction in mental standards directed by Congress in 1951. These data also represent only those men passing through Selective Ser-

vice for induction and do not include those entering the Armed Forces by recruitment and through ROTC.

Further exploration of the observed relationship may be directed toward a determination of its stability when data of a different time span are used (for example, the period following April, 1952.) It is to be noted, however, that rejection rates prior to the systematic use by the Army of the Armed Forces Qualification Test in its present form would not be comparable. This test was introduced on January 1, 1950, as a means of placing acceptance and rejection for mental reasons on a uniform basis throughout the United States and represented a major administrative modification of induction procedures.

Computed and observed rates (per cent) of rejection for military service, by states.

State	Computed	Observed	State	Computed	Observed
South Carolina	57.8	63.3	Rhode Island	30.6	31.6
Arkansas	41.5	56.8	Illinois	29.7	31.1
Louisiana	50.0	55.9	California	22.1	31.0
Mississippi	53.9	55.2	Vermont	33.4	30.8
Alabama	53.4	54.6	Connecticut	26.2	30.2
Georgia	51.2	51.4	Ohio	31.7	29.9
Tennessee	45.2	49.1	Colorado	30.5	28.8
Virginia	50.1	48.7	Washington	27.5	28.7
North Carolina	46.4	45.1	Massachusetts	27.3	28.4
Kentucky	42.7	44.3	New Jersey	26.7	28.3
Florida	44.6	41.5	Wisconsin	26.1	28.1
New Mexico	40.1	39.3	Indiana	33.2	27.7
Maine	36.4	38.0	Nevada	36.8	27.0
West Virginia	39.0	37.7	Wyoming	26.4	26.8
Arizona	41.0	35.9	Idaho	32.2	26.7
Oklahoma	33.5	35.6	New Hampshire	30.1	26.6
Delaware	34.0	35.4	Nebraska	25.7	25.2
Texas	39.6	34.9	Montana	27.8	23.3
Michigan	31.0	34.8	South Dakota	24.1	23.2
Maryland	42.8	34.1	Utah	32.1	22.6
New York[1]	22.3	33.7	Iowa	23.4	22.2
Pennsylvania	37.1	32.1	Kansas	25.2	20.7
Missouri	32.7	31.9	North Dakota	27.3	20.7
Oregon	26.4	31.9	Minnesota	21.3	20.3

[1] Rate for New York obtained by averaging rate for New York City and rate for New York State exclusive of New York City.

In the interest of accurate estimation of manpower resources it might be worthwhile to use as a criterion the sum of rejections at pre-induction examination and induction inspection, and to correct for (1) per cent of individuals administratively accepted (that is, accepted by the Armed Forces notwithstanding failure on some element of the physical and mental examination), and (2) for men entering the Armed Forces through means other than the selective service system. It might also be of interest and value to examine the white-non-white differentials in the various states as a possible factor in accounting for the residual variance.

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