

Economic Development, Political-Economic System, and the Physical Quality of Life

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Abstract: This study compared capitalist and socialist countries in measures of the physical quality of life (PQL), taking into account the level of economic development. The World Bank was the principal source of statistical data for 123 countries (97 per cent of the world's population). PQL variables included: 1) indicators of health, health services, and nutrition (infant mortality rate, child death rate, life expectancy, population per physician, population per nursing person, and daily per capita calorie supply); 2) measures of education (adult literacy rate, enrollment in secondary education, and enroll-

ment in higher education); and 3) a composite PQL index. Capitalist countries fell across the entire range of economic development (measured by gross national product per capita), while the socialist countries appeared at the low-income, lower-middle-income, and upper-middle-income levels. All PQL measures improved as economic development increased. In 28 of 30 comparisons between countries at similar levels of economic development, socialist countries showed more favorable PQL outcomes. (*Am J Public Health* 1986; 76:661-666.)

Introduction

Economic development is a widely studied historical process that exerts profound effects on the physical quality of life (PQL).^{1,2} The effects of differing political-economic systems, specifically socialism versus capitalism, have received much less attention. Whether a country adopts one system or another exerts a profound influence on social policy in general and on development strategies in particular.

Despite the importance of this issue, there is very little published research that addresses the relationship of PQL and political-economic system at different levels of economic development. Large cross-national studies, such as those conducted by the World Health Organization, have assessed the relationship of economic development to PQL without taking political-economic system into account.³ In the analysis that follows, we have compared PQL in capitalist and socialist countries, grouped by level of economic development.

Methods

Sources of Data

Our major statistical source for this research was *The World Development Report, 1983*, of the World Bank.⁴ Although the World Bank's raw data provide a rich source for secondary data analysis, to our knowledge these data have not been used previously in published reports to compare the capitalist and socialist countries systematically.⁵⁻⁸ There are several advantages in using these data from the World Bank. The Bank's extensive efforts in data collection around the world make this probably the most comprehensive set of data available for scholarly research. The data published by the World Bank and analyzed in this article pertain to 123 countries and approximately 97 per cent of the world's population. (The World Bank omits those nations with populations less than one million.) Technical staff members of the World Bank introduce corrections and re-estimations when they determine that problems have arisen in the statistics for specific countries. Procedures used in these

adjustments are included with the published data. The World Bank's statistical reporting tends to be conservative, in the sense that overly enthusiastic statistics reported from specific countries are appraised and adjusted to obtain more accurate figures. Most importantly, the data are readily available for inspection and reanalysis by other scholars.

For a small number of countries, the World Bank's data on some of the variables studied were incomplete. In these instances, we used data from two reports: *The State of the World's Children, 1984*, of the United Nations Children's Fund (UNICEF), and *World Military and Social Expenditures, 1983*, compiled by R.L. Sivard.^{9,10} Appendix A specifies the countries and variables that were studied and the data sources that were used in each case. A prior study employed data published by the World Bank in 1978.¹¹ The results reported here confirmed all the findings of the study that used these earlier data.^{12,13}

Independent Variables

Two independent variables were examined: level of economic development, and political-economic system. The measure of level of economic development was the gross national product per capita (GNP/c). We also explored the use of several additional measures of economic development: average annual growth rate of GNP/c, energy consumption per capita, percentage of the population in urban areas, and percentage of the labor force in agriculture. The additional measures of economic development all were highly correlated with GNP/c and, in the multivariate analysis, did not add to the explanatory importance of GNP/c alone.^{12,13}

The designation of each country's political-economic system as capitalist or socialist corresponded to the United Nations' classification of countries as market economies or as centrally planned economies. The World Bank has used a somewhat similar classification scheme in the reporting of data in *The World Tables*, which contrast the "East European nonmarket economies" to the market economies.^{4,5}

It should be noted that some of the capitalist countries have maintained a public sector that is centrally planned, although the private ownership and accumulation of capital have predominated. Likewise, certain socialist countries have permitted limited market-oriented economic activities within an overall centrally planned economy. We have chosen not to introduce a separate category of "mixed economy" for several reasons, however. There are very few countries that genuinely incorporate both substantial market principles and central planning of the economy. Those countries commonly considered to represent mixed econo-

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mies in Western Europe and Scandinavia are almost exclusively high-income countries. Their categorization as mixed systems would not affect the comparisons of the capitalist and socialist countries at the low-income, lower-middle-income, or upper-middle-income levels of economic development. Most importantly, the dichotomized classification does convey the current reality that the socialist countries, as listed above, coordinate the bulk of their economic activities through a centrally planned approach, while the capitalist countries rely to a much larger extent on market mechanisms.

A third category of political-economic system was added to this classification. There were 10 countries in the World Bank's data set that changed political-economic systems within the last 20 years. That is, through a process of social revolution, these countries reoriented their political-economic systems to a more centrally planned approach. In these countries, however, a socialist political-economic system generally has not been consolidated to the same degree that it has in countries that changed their systems more than 20 years ago. Predictably, the impact of change in political-economic system could not be fully realized within such a brief period of time. In the data analysis, these countries were categorized as "recent postrevolutionary countries," rather than capitalist or socialist (Appendix A).

Dependent Variables

The measures of health, health services, and nutrition were: infant mortality rate (ages 0-1), child death rate* (ages 1-4), life expectancy at birth, population per physician, population per nursing person, and daily per capita calorie supply as a percentage of requirement. Measures of education included: adult literacy rate, number enrolled in secondary schools as a percentage of age group, and number enrolled in higher education as a percentage of population aged 20-24.

The Physical Quality of Life Index (PQLI) is a composite index, calculated from the infant mortality rate, life expectancy, and literacy rate. Appendix B gives the formula for its computation, as employed in this study. The PQLI is a measure which was originated and developed by the Overseas Development Council (ODC).¹ Since its inception and refinement, it has been used extensively in cross-national research. As a summary index, the PQLI provides an important view of how countries differ in some of the most crucial aspects of PQL.

Comparing the Countries

The countries were grouped by GNP/c into categories of low-income, lower-middle-income, upper-middle-income, high-income, and high-income oil-exporting countries. The latter category included four capitalist nations that the World Bank classified separately (Appendix A). Although they have high incomes, these four countries are developing, nonindustrial societies which have manifested many of the problems of underdevelopment. Because they have fared poorly in indicators of the PQL, their inclusion with other capitalist countries would present an inaccurately negative picture of the PQL outcomes within industrial capitalism.

Table 1 presents the classification of countries by level of economic development and political-economic system, in addition to the income range, average income, and number of countries within each category. As can be seen, capitalist countries fell across the entire spectrum of economic devel-

TABLE 1—Classification of Countries by Level of Economic Development and Political-Economic System

Classification of Countries	Number of Countries	GNP/c Range (\$), 1981	GNP/c Mean (\$), 1981
Low-Income Countries			
Recent postrevolutionary	10	70-870	347
Capitalist	33	80-530	299
Socialist	1	300	300
Lower-Middle-Income Countries			
Capitalist	28	540-1700	1080
Socialist	4	780-1410	1040
Upper-Middle-Income Countries			
Capitalist	20	2140-7700	4018
Socialist	8	2100-7180	4129
High-Income Countries			
Capitalist	15	9110-17430	12281
High-Income Oil-Exporting Countries			
Capitalist	4	8450-24660	16653

opment, while socialist countries appeared in the low-income, lower-middle-income, and upper-middle-income categories. The recent postrevolutionary countries all appeared in the low-income range of economic development.

In this classification scheme, there were 100 capitalist countries, 13 socialist countries, and 10 recent postrevolutionary countries. Taken together, the capitalist countries in the study included approximately 62 per cent of the world's population; the socialist countries, approximately 32 per cent; and the recent postrevolutionary countries, about 3 per cent. It should be noted that only one socialist country (China) fell in the low-income category. Therefore, comparison of PQL outcomes between this country and capitalist countries in the low-income category remained tentative.

The statistical techniques that were used to study the interrelationships among PQL, level of economic development, and political-economic system included cross-tabulations, analysis of variance, and multiple regression.

Results

Measures of Health, Health Services, and Nutrition

Table 2 presents the mean values of these PQL variables for each group of countries. All the measures revealed marked improvements as level of economic development increased. However, at the same level of economic development, the socialist countries showed more favorable outcomes than the capitalist countries in all these measures. The more favorable performance of the socialist countries was evident in each of the 18 comparisons that could be made. Differences between capitalist and socialist countries in PQL were greatest at lower levels of economic development and tended to narrow at the higher levels of development.

Within each level of economic development, the socialist countries had infant mortality and child death rates approximately two to three times lower than the capitalist countries. Similar, though less striking, relationships emerged for life expectancy. Differences were again largest for the low-income and lower-middle-income countries, and narrowed for the upper-middle-income countries.

Countries at higher levels of economic development provided more favorable ratios of medical and nursing personnel for their populations. Socialist countries consistently showed higher numbers of health professionals per population than capitalist countries at equivalent levels of economic development. These differences were again sharp-

*This term is used by the World Bank rather than the more familiar term, preschool mortality.

TABLE 2—Physical Quality of Life Variables, Economic Development, and Political-Economic System: Mean Values^a

Variables	Recent Post- Revolutionary Countries	Capitalist Countries	Socialist Countries
Infant mortality rate (per 1000), 1981			
Low-income	133	131	71
Lower-middle-income	—	81	38
Upper-middle-income	—	42	22
High-income	—	10	—
High-income oil-exporting	—	73	—
Child death rate (per 1000), 1981			
Low-income	22.3	25.7	7.0
Lower-middle-income	—	11.0	2.3
Upper-middle-income	—	4.0	1.1
High-income	—	(.) ^b	—
High-income oil-exporting	—	8.2	—
Life expectancy (years), 1981			
Low-income	48	48	67
Lower-middle-income	—	60	68
Upper-middle-income	—	69	72
High-income	—	75	—
High-income oil-exporting	—	61	—
Population per physician, 1980			
Low-income	18873	19100	1920
Lower-middle-income	—	5832	638
Upper-middle-income	—	1154	488
High-income	—	524	—
High-income oil-exporting	—	965	—
Population per nursing person, 1980			
Low-income	5699	4763	1890
Lower-middle-income	—	1646	303
Upper-middle-income	—	692	210
High-income	—	142	—
High-income oil-exporting	—	518	—
Daily per capita calorie supply (% requirement), 1980			
Low-income	85	94	107
Lower-middle-income	—	106	117
Upper-middle-income	—	122	137
High-income	—	131	—
High-income oil-exporting	—	134	—
Adult literacy rate (%), 1980			
Low-income	46	34	69
Lower-middle-income	—	63	87
Upper-middle-income	—	81	97
High-income	—	99	—
High-income oil-exporting	—	50	—
Secondary education (% age group), 1980			
Low-income	22	15	34
Lower-middle-income	—	38	74
Upper-middle-income	—	59	74
High-income	—	86	—
High-income oil-exporting	—	56	—
Higher education (% age group), 1979			
Low-income	1.9	1.7	1.0
Lower-middle-income	—	12.1	11.7
Upper-middle-income	—	15.7	18.6
High-income	—	28.3	—
High-income oil-exporting	—	7.0	—
PQLI, 1980–1981			
Low-income	38	35	76
Lower-middle-income	—	62	83
Upper-middle-income	—	81	92
High-income	—	98	—
High-income oil-exporting	—	60	—

a) For further discussion of the statistical analysis and significance testing, see Appendix A. Table 1 presents the number of countries in each category.

b) Less than one, as reported by World Bank.⁴

est at the low-income and lower-middle-income levels. The ratio of population per physician in lower-middle-income and

upper-middle-income socialist societies was comparable to that of high-income capitalist societies.

Socialist countries provided a higher daily per capita calorie supply as a percentage of requirement than did the capitalist countries at a similar level of development. The difference between capitalist and socialist countries averaged 12 to 15 per cent. Nutritional supply of all socialist countries exceeded the 100 per cent requirement.

The recent postrevolutionary low-income societies showed PQL outcomes roughly similar to those of the low-income capitalist countries. PQL in the high-income oil-exporting countries was less consistent. These countries were similar to the lower-middle-income capitalist countries in infant mortality, child death rate, and life expectancy. They resembled the upper-middle-income capitalist countries in numbers of health professionals, and the high-income capitalist countries in nutritional supply.

Measures of Education

Table 2 also presents mean values for the three measures of education. With the exception of one tie (there was no difference between the lower-middle-income and upper-middle-income socialist countries in secondary education), all measures of education improved with the level of economic development. Within each level of economic development, socialist countries showed favorable adult literacy rates and numbers enrolled in secondary schools as a percentage of age group. Regarding participation in higher education, the socialist countries at the upper-middle-income level showed a greater degree of participation, although the difference was not large. Low-income and lower-middle-income capitalist countries showed a fraction of a per cent greater participation in higher education than the socialist countries.

The recent postrevolutionary societies manifested slightly better outcomes than the low-income capitalist countries on all three measures of education. High-income oil-exporting countries were midway between low-income and lower-middle-income capitalist countries in adult literacy and enrollment in higher education but were similar to upper-middle-income capitalist countries regarding participation in secondary education.

Physical Quality of Life Index

As a composite and derived measure, the PQLI closely paralleled the other findings, increasing with level of economic development. In all three comparisons within given levels of development, socialist countries achieved markedly higher PQLIs. The PQLIs of the recent postrevolutionary countries resembled those of the low-income capitalist countries. The high-income oil-exporting countries were similar in PQLI to the lower-middle-income capitalist nations.

Multivariate Analysis

To assess the relative importance of political-economic system and level of economic development, we performed analysis of variance and multiple regression procedures, whose results were consistent with one another. Because of space limitations, we present only the regression analysis here. In the regression, GNP/c was treated as a continuous variable and political-economic system was treated as a dummy variable. Table 3 gives the standardized and unstandardized coefficients, constants, and R² calculations from the regression. As expected, the regression showed that level of economic development was a strong predictor of all PQL variables. Political-economic system also was a strong

TABLE 3—Physical Quality of Life Variables, Economic Development, and Political-Economic System: Multiple Regression^a

Variables	Beta _{ed}	Beta _{pe}	Constant	R ²
Infant mortality	-.60 (-.01)	-.34 (-55.97)	(214.92)	.45
Child death rate	-.52 (-.001)	-.28 (-11.77)	(41.18)	.33
Life expectancy	.61 (.001)	-.33 (11.56)	(31.78)	.47
Population per physician	-.42 (-.93)	-.25 (-8332.49)	(28310.82)	.23
Population per nursing person	-.28 (-.23)	-.16 (b)	(2892.71)	.08
Calorie supply	.65 (.003)	-.35 (20.75)	(57.84)	.53
Adult literacy	.50 (.003)	.35 (31.73)	(-12.38)	.35
Secondary education	.63 (.004)	.33 (31.29)	(-34.61)	.49
Higher education	.55 (.001)	.14 (b)	(7.46)	.30
PQLI	.58 (.003)	.35 (28.68)	(-6.75)	.44

a) Standardized beta coefficients were computed from stepwise multiple regression. Beta_{ed} is the standardized beta coefficient for level of economic development, expressed as GNP/c. Beta_{pe} is the standardized beta coefficient for political-economic system, treated as a dummy variable. Unstandardized regression coefficients and constants are indicated in parentheses. R² is an estimate of the variance in each PQL variable accounted for by the multiple regression equation. The regression procedure included 113 countries, excluding the recent postrevolutionary countries. For further discussion of the statistical analysis and significance testing, see Appendix A.

b) Unstandardized regression coefficient is not given because insignificant additional variance was explained by entry of variable into the regression equation.

predictor, though less so than GNP/c, of all PQL variables except population per nursing person and enrollment in higher education. In summary, the multiple regression procedure confirmed the importance of both level of economic development and political-economic system as correlates of PQL.

Discussion

Our analysis of the World Bank's data supports a conclusion that, in the aggregate, the socialist countries have achieved more favorable PQL outcomes than capitalist countries at equivalent levels of economic development. Are there problems in the data or the analysis that might contradict this conclusion?

Statistical information published by the World Bank represents probably the most comprehensive and accurate body of data on PQL that is available from Western sources. The primary tabulations are readily available in published form for scholarly inspection and reanalysis. Data collection and reporting from the socialist countries are likely to be at least as accurate as in the capitalist countries. All the socialist countries maintain statistical bureaus that gather and publish these data as one phase of planning and policy formulation. These efforts periodically lead to findings that are not necessarily favorable. For example, infant mortality, crude death rate, and cardiovascular mortality in the Soviet Union worsened during the 1970s.¹⁴⁻¹⁸ In Cuba, reported mortality rates rose during the early 1960s and later improved rapidly; the temporary increase in mortality reflected improved data gathering, as the Ministry of Public Health expanded its efforts after the Cuban Revolution.^{19,20} Underreporting morbidity and mortality statistics frequently occurs in the low-income and lower-middle-income countries. However, better reporting would tend to increase morbidity and mortality

rates and would strengthen the finding of more favorable outcomes in the socialist countries.

Other causal or intervening variables could be important in predicting PQL. Such variables might include climate, environmental hazards, genetic heritage, cultural tradition, and additional political and social factors. We have not tried to control for all such factors, but we doubt that they would reduce the importance of economic development and political-economic system to any significant degree. Regarding political-economic system, for example, the socialist countries span three continents, a variety of climatic and environmental conditions, genetic mixes, cultures, and forms of social organization. Despite this great diversity, the fact that superior rates persist for socialist countries on all PQL variables except one at the lower three levels of economic development strengthens the probability that political-economic system is indeed a major determining factor.

Historically, there is some evidence that the discrepancies between capitalist and socialist nations have reflected varying social policies. All the socialist countries have initiated major public health efforts. These initiatives have aimed toward improved sanitation, immunization, maternal and child care, nutrition, and housing. In every case, the socialist countries also have reorganized their health care systems, to create national health services based on the principle of universal entitlement to care. These policies have led to greater accessibility of preventive and curative services for previously deprived groups. Expanded educational opportunity also has been a major priority of the socialist nations, as publicly subsidized education has become more widely available. Literacy campaigns in these countries have brought educational benefits to sectors of the population who earlier had not gone to school.

Nevertheless, national health policies, including national health insurance and/or a national health service, have not been enacted solely by socialist countries. In fact, all the high-income capitalist countries except the United States have enacted such national health policies. While capitalist countries at higher levels of economic development have enjoyed the fruits of public health and educational improvements, poorer capitalist countries seldom have succeeded in implementing such drastic changes in policy, although there are some notable exceptions to this pattern. For example, among low-income and lower-middle-income countries, Sri Lanka and Costa Rica have achieved substantial improvements in health-care services and PQL indicators.⁷ The experiences of such countries show that adequate budgeting, planning, and commitment can lead to important advances, even in the context of underdeveloped capitalist economies. These exceptions, however, do not detract from the generally unfavorable record of the capitalist countries at lower levels of economic development. Moreover, even in the wealthier capitalist countries, public health and educational policies have not achieved equitable access for low-income groups, racial minorities, and geographically isolated communities.^{21,22}

Cross-national differences in income inequality and the distribution of wealth may contribute to the socialist countries' favorable PQL outcomes. The socialist countries manifest a higher proportion of income received by the lowest 20 per cent of the population, a lower proportion of income received by the highest 5 per cent of the population, and a markedly lower Gini index of inequality.^{12,13} Inequality continues to exist in all the socialist societies, but the range

of inequality tends to be much narrower than in the capitalist countries.

In the less developed countries, the differences in PQL between the capitalist and socialist systems are profound. There, the options in public health and education that a socialist political-economic system provides seem to overcome some of the grueling deprivations of poverty. Many of the recent postrevolutionary societies (which we treated as a separate category in the data analysis) have adopted socialist systems. Predictably, these countries may witness improvements in PQL during the next decade that will differentiate them from other countries at their level of economic development.

Meanwhile, the relationships between PQL and political-economic system deserve more serious attention than they have received in the past. Our findings indicate that countries with socialist political-economic systems can make great strides toward meeting basic human needs, even without extensive economic resources. When much of the world's population suffers from disease, early death, malnutrition, and illiteracy, these observations take on a meaning that goes beyond cold statistics.

APPENDIX A

CLASSIFICATION OF COUNTRIES, SOURCES OF DATA, AND COMMENTS ON DATA ANALYSIS

I. Classification of Countries

The following list presents the classification of countries that was used in the study. Within each category, the ordering of countries corresponds to that of the World Bank.

Capitalist Countries

Low-income—Bhutan, Chad, Bangladesh, Nepal, Burma, Mali, Malawi, Zaire, Uganda, Burundi, Upper Volta, Rwanda, India, Somalia, Tanzania, Guinea, Haiti, Sri Lanka, Benin, Central African Republic, Sierra Leone, Madagascar, Niger, Pakistan, Sudan, Togo, Ghana, Kenya, Senegal, Mauritania, Yemen (Arab Republic), Liberia, Indonesia.

Lower-middle-income—Lesotho, Bolivia, Honduras, Zambia, Egypt, El Salvador, Thailand, Philippines, Papua New Guinea, Morocco, Nigeria, Cameroon, Congo, Guatemala, Peru, Ecuador, Jamaica, Ivory Coast, Dominican Republic, Colombia, Tunisia, Costa Rica, Turkey, Syria, Jordan, Paraguay, South Korea, Lebanon.

Upper-middle-income—Iran, Iraq, Algeria, Brazil, Mexico, Portugal, Argentina, Chile, South Africa, Uruguay, Venezuela, Greece, Hong Kong, Israel, Singapore, Trinidad and Tobago, Ireland, Spain, Italy, New Zealand.

High-income—United Kingdom, Japan, Austria, Finland, Australia, Canada, Netherlands, Belgium, France, United States, Denmark, West Germany, Norway, Sweden, Switzerland.

High-income oil-exporting—Libya, Saudi Arabia, Kuwait, United Arab Emirates.

Socialist Countries

Low income—China.

Lower-middle-income—Cuba, Mongolia, North Korea, Albania.

Upper-middle-income—Yugoslavia, Hungary, Romania, Bulgaria, Poland, USSR, Czechoslovakia, East Germany.

Recent Postrevolutionary Countries

Low-income—Kampuchea, Laos, Ethiopia, Afghanistan, Vietnam, Mozambique, Yemen (People's Democratic Republic), Angola, Nicaragua, Zimbabwe.

II. Sources of Data for Items Not Available from World Bank⁴

From *The State of the World's Children, 1984*, by the United Nations Children's Fund (UNICEF),⁹ the following data were obtained: *GNP/c* for Kampuchea, Afghanistan, Vietnam, Mozambique, Angola, Cuba, Mongolia, North Korea, Iran, Iraq, Lebanon, Albania, Bulgaria, Poland, USSR, Czechoslovakia, and East Germany; *infant mortality* for Kampuchea, Albania, and USSR; *life expectancy* for Kampuchea and Mozambique; *crude death rate* for

Kampuchea and Mozambique; and *crude birth rate* for Kampuchea and Mozambique. From *World Military and Social Expenditures, 1983*, compiled by R.L. Sivard,¹⁰ the following data were obtained: *adult literacy rate* for Kampuchea, Ghana, Angola, Cameroon, Congo, Guatemala, Mongolia, North Korea, Iraq, Lebanon, Chile, South Africa, Greece, Israel, Libya, Spain, Albania, Bulgaria, Czechoslovakia, and East Germany; and *population per physician* for Angola and South Africa.

III. Comments on Data Analysis

Malaysia and Panama, with GNP/c of \$1840 and \$1910 respectively, fell between the lower-middle-income and upper-middle-income capitalist categories and were eliminated from the analysis. If they had been included in the lower-middle-income capitalist category, the average GNP/c for capitalist and socialist countries at this level would have been \$1133 and \$1040 respectively, instead of \$1080 and \$1040. If they had been included in the upper-middle-income category, the average GNP/c for capitalist and socialist countries at this level would have been \$3823 and \$4129, instead of \$4018 and \$4129. We performed a subsequent analysis to include Malaysia and Panama in first the lower-middle-income category and then the upper-middle-income category. Results were similar and are available for interested readers on request to the authors.

The decision to use unweighted means was consistent with the goal of retaining, to the greatest extent possible, each country's characteristics, rather than the cumulative characteristics of the world's population. With weighted means, data on the low-income capitalist countries would reflect mainly the conditions in India, while Brazil and the Soviet Union for the upper-middle-income categories, and the United States for the high-income category, would greatly color all the statistics computed.

In this study, the countries comprised the universe of all countries in the world with populations of one million or more. Because the data derived from the universe of all such countries, sampling procedures were not used. The reporting of statistical significance levels in Tables 2 and 3 therefore would be controversial. While this report does not present tests of statistical significance, the results of such tests are available from the authors on request.

APPENDIX B

CALCULATION OF PHYSICAL QUALITY OF LIFE INDEX

The Physical Quality of Life Index was calculated by the Overseas Development Council's (ODC's) formula:

$$PQLI = (im + e + 1)/3,$$

where

$$im = (229 - [\text{infant mortality rate}])/2.22,$$

$$e = ([\text{life expectancy at birth}] - 38)/0.39, \text{ and}$$

$l = \text{literacy rate.}$

In its calculations of PQLI, the ODC generally uses life expectancy at age one, rather than at birth. The former statistic was unavailable for many of the countries in this study. We elected to use life expectancy at birth, which was readily available for most countries from data of the World Bank. The ODC notes that this decision has a fairly uniform effect of lowering PQLI slightly from that calculated with life expectancy at age one: "If a figure for life expectancy at age one is not available, life expectancy at birth may be used, although this will result in a slightly lower PQLI."²³

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**Call for Abstracts for
APHA Late-Breaker Epidemiology Exchange Session**

The Epidemiology Section will sponsor a Late-Breaker Epidemiologic Exchange on Wednesday, October 1, 1986 at APHA's Annual Meeting in Las Vegas, NV. The Exchange will provide a forum for presentation of investigations, studies, methods, etc., which have been conceived, conducted, and/or concluded so recently that abstracts could not meet the deadline for submission to other Epidemiology Sessions. Papers submitted should report on work conducted during the last 6-12 months.

Abstracts should be limited to 200 words; no special form is required. Abstracts should be submitted to

Robert A. Gunn, MD
Division of Field Services
Epidemiology Program Office
Bldg. 1, Room 3070
Centers for Disease Control
Atlanta, GA 30333 and

Abstracts must be received by August 15, 1986.