

URBANIZATION AND FERTILITY: THE NON-WESTERN EXPERIENCE

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INTRODUCTION

URBANIZATION has come in for considerable attention in recent years. Nearly all commentators on the lesser-developed areas stress the importance of the growth of cities there and the economic, social and also demographic implications and ramifications of this growth. Urbanization is clearly at once a cause and an effect of the break-up of the old agriculture-oriented societies and a symptom of the beginnings of what may ultimately become urban industrial societies in the Western pattern.¹

¹The recent literature on these topics is vast. Two very useful symposia are World Urbanism, [P. M. Hauser, ed.], *The American Journal of Sociology*, March, 1955, LX, (5) and The Role of Cities in Economic Development and Cultural Change, *Economic Development and Cultural Change*. October, 1954, III, (2); January, 1955, III, 2. Two recent UN documents are also helpful—UNESCO Research Centre on the Social Implications of Industrialization in Southern Asia: URBANIZATION IN ASIA AND THE FAR EAST, [P. M. Hauser, ed.], 1958; United Nations, Bureau of Social Affairs: REPORT ON THE WORLD SOCIAL SITUATION, New York, 1957. Among the many other articles, two outstanding contributions are by Hoselitz, Bert F.: The City, the Factory, and Economic Growth, *American Economic Review*, May, 1955, XLV, (2), and Anderson, Nels, Urbanism and Urbanization, *American Journal of Sociology*, July, 1959, XLV, (1).

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To demographers one of the most important aspects of this urbanization is its possible impact on fertility and the population growth rate in these nations.

In the West, the decline of fertility seems to have originated primarily in the cities and to have spread from the urban foci into the rural hinterland. It is possible that in the less-developed countries, likewise, urbanization may eventually have a profound influence upon population growth. This possibility must be taken into account in the consideration of the general economic and social implications of urbanization.²

This paper is an empirical investigation of the relationship between urbanization and fertility in the lesser-developed nations. It begins by sketching out the generally accepted position on this question, examines this position critically in the light of what recent data are available, and finally suggests some conclusions which require a substantial modification of the presently held view.

PRESENT VIEWS ON URBAN-RURAL FERTILITY

The existence of a rural-urban fertility differential must certainly rank as one of the most widely validated and accepted generalizations in the demographic literature of the Western world. An inverse relationship between size of place and fertility has been demonstrated for virtually every country in Europe and the European sphere of settlement. The sizes of the differentials have varied among countries and from region to region within given countries, but urban fertility thirty per cent or more below rural fertility can be described as common.³ The focus of discussion of these differentials has long since

² United Nations, Bureau of Social Affairs: *Report on the World Social Situation*, p. 123.

³ Of the U. S., Bogue notes: "In 1810 the urban ratio (900) was 68 per cent as high as the rural ratio (1,329) and by 1940 the urban ratio had 'declined' to 56 per cent of the rural ratio (551)." See Bogue, D. J., *THE POPULATION OF THE UNITED STATES*. Glenco, The Free Press, 1959, p. 306.

⁴ Spengler, J. J., *Population Theory, A SURVEY OF CONTEMPORARY ECONOMICS*, Vol. II. Homewood, Irwin Press, 1952, pp. 102-103.

passed on to the trends in the rates and to such questions as whether the differential is widening or narrowing. The reasons for the lower urban fertility also seem clear enough.

Urbanization (or deruralization), concomitant of output-increasing industrialization, has been unfavorable to fertility, presumably because there has been associated with progress in urbanization an intensification of more elements (e.g. level and content of aspirations; relative net cost of rearing children) that are or can become inimical to childbearing and childrearing than of elements that are favorable (e.g. better medical care). As a rule fertility varies inversely with the degree of urbanization; it is higher in rural than in urban populations, and in smaller than in larger urban communities.⁴

Warren Thompson lists, as factors causing the lower urban fertility, such things as: negative economic value of children in the city, a desire for social and personal pleasure by the parents, and the relative ease of contraception and abortion.⁵

Turning to the non-Western, lesser-developed populations, various researchers have satisfied themselves that the urban-rural fertility differentials are to be found there, too. Writing some twenty years ago on the basis of a survey of information on urban-rural fertility in many parts of the globe, Jaffe concluded rather sweepingly:

Urban-rural differential fertility is far more widespread than was originally thought. Not only does it exist today in the European nations and in those lands whose population is predominantly of European descent, but it is also found among the populations of Latin-American countries. . . . Asiatic populations. . . . Moslems in Palestine, among the native

⁵ Thompson, W. S.: *POPULATION PROBLEMS*, [second edition]. New York, McGraw-Hill, 1935, pp. 166-169; *Urbanization in* *ENCYCLOPEDIA OF THE SOCIAL SCIENCES*, 15: 191 ff; and *RATIO OF CHILDREN TO WOMEN, 1920*, Census Monograph IX. Washington, D.C., Government Printing Office, 1931, pp. 128 ff.

Negroes and the Asiatics in South Africa, and among the non-white group . . . in the United States.⁶

Studies in depth of particular countries—including India and Pakistan, Mexico, Puerto Rico, Malaya, Ceylon and Japan—all appeared to support this conclusion.⁷

The United Nations was undoubtedly expressing the consensus when it stated:

There are adequate statistical data to demonstrate that fertility is lower in urban industrial countries than in agricultural countries, and that it is lower in urban than in rural parts of the same country, whether the country is industrially advanced or not.⁸

By and large such generalizations have gone unchallenged. The occasional exceptions to this general rule have been seen as curiosities, explicable in terms of some unique local circumstance.⁹ In fact, the lower urban fertility has been so uncritically accepted that very few investigators appear to have asked themselves why such differentials existed. It was clear that even in the large cities of the lesser-developed nations contraception was virtually unknown. True, such family planning as was

⁶ Jaffe, A. J., *Urbanization and Fertility*, *American Journal of Sociology*, July, 1942, XLVIII, (1): 57. A later, somewhat similar survey of Latin-American fertility ratios is contained in Tietze, C., *Human Fertility in Latin America*, *Annals of the American Academy of Political and Social Science*, March, 1958, 316: 84-93.

⁷ Davis, Kingsley: *THE POPULATION OF INDIA AND PAKISTAN*. Princeton, Princeton University Press, 1951, Chapter 10. Moore, Wilbert, *INDUSTRIALIZATION AND LABOR*. Ithaca, Cornell University Press, 1951, pp. 219 ff. Combs, J. W., and Davis, Kingsley: *Differential Fertility in Puerto Rico*, *Population Studies*, November, 1951, V(2): 104-116. Smith, T. E.: *POPULATION GROWTH IN MALAYA*. Royal Institute of International Affairs, Oxford University Press, 1952, pp. 52 ff. Huyck, Earl: *Differential Fertility in Ceylon*, *Population Bulletin* [of the United Nations], December, 1945, (4): 21-29. Taeuber, Irene B.: *THE POPULATION OF JAPAN*. Princeton, Princeton University Press, 1958, pp. 256 ff.

⁸ United Nations, Statistical Office, *DEMOGRAPHIC YEARBOOK*, 1952, p. 15. See also, United Nations, Department of Social Affairs, *Population Bulletin* No. 17, *THE DETERMINANTS AND CONSEQUENCES OF POPULATION TRENDS*, pp. 78 ff.

⁹ Egypt, for example. See, Kiser, Clyde V., *The Demographic Position of Egypt*, in *DEMOGRAPHIC STUDIES OF SELECTED AREAS OF RAPID GROWTH*. New York, Milbank Memorial Fund, 1944. Also, El-Badry, M. A., *Some Aspects of Fertility in Egypt*, *Milbank Memorial Fund Quarterly*, January, 1956, XXXIV (1): 23-43.

practiced centered in the large cities, but it still affected only a small per cent of the population there. The scale of such practices certainly was not sufficient to explain the observed 30 and 40 per cent differentials in the fertility ratios of the cities compared to the countryside. Why, then, did these differentials exist? On this point, most studies were notably silent.

A SURVEY OF RECENT EVIDENCE

In the past, lack of reliable data has hampered demographic investigations of the lesser-developed regions. This continues to be true but, thanks to a spate of censuses in the last decade, more light than ever before can be cast on the special demographic problems of these regions.

Table 1 presents 19 urban and rural fertility ratios for non-Western countries drawn from censuses taken in the decade 1950-1960.¹⁰ Some interesting contrasts are revealed. In five cases the urban fertility ratios are actually above those of the rural portion of the country; in three other cases, there are virtually no observable differentials; in four others the urban differentials are fifteen per cent or less; in two they are thirty per cent or less; while in the remaining five cases they are more than thirty per cent, including one showing a differential of nearly 50 per cent.

Now, these results do not permit any definite conclusions. The age data on which all these ratios are based are poor and subject to considerable reporting and enumerative error. They are not, in any statistical sense, representative of the whole universe of lesser-developed areas. Nevertheless, they certainly must shake one's faith in the comfortable assertions concerning urban-rural fertility differentials with which the literature abounds. About the best that can be said is that in some lesser-developed populations the familiar differential appears clearly,

¹⁰ These 19 represent those non-Western censuses (a) taken in the period 1950-1960 and published or otherwise available by December, 1961; (b) containing age groupings along urban and rural lines such as to permit the calculation of fertility ratios. Lack of registration data makes it impossible to use birth rates or reproduction rates as the measure of fertility.

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in others less obviously, in some not at all, and in others the differential runs in the opposite direction from that expected. Instead of uniformity, there is a spectrum.

The data in Table 1 represent a cross-sectional view of rural-urban fertility within a small group of countries in the period 1950 to 1960. Unfortunately, it is not possible to trace the changes over time in the urban-rural fertility ratio differentials for this group of countries. Only for a handful of these coun-

Table 1. Urban and rural fertility ratios for selected non-western populations, 1950-1960.

	<i>Infants 0-4 per 1,000 Females 15-49 Unless Otherwise Noted</i>		<i>Urban as a Per Cent of Rural</i>
	<i>Urban</i>	<i>Rural</i>	
Algeria (1954) ^a	894	845	105.8
Brazil (1960)	430	778	55.3
British North Borneo (1951) ^b	706	579	121.9
Burma (1953) ^c	156	146	107.0
Ceylon (1953)	549	672	81.7
Chile (1952)	451	709	63.6
Cuba (1953)	375	729	51.4
India (1951)	598	626	96.0
Iran (1956) ^d	134	147	91.0
Jamaica (1953) ^e	366	622	58.8
Libya (1954) ^f	582	679	85.7
Malaya (1957) ^g	844	800	105.5
Mauritius (1952) ^h	524	580	90.3
Morocco (1952)	508	791	64.2
Nepal (1952/54) ⁱ	423	440	96.1
Nigeria (1952) ^j	1,958	1,184	165.4
Pakistan (1951) ^k	1,169	1,195	97.8
Sudan (1955/56) ^l	717	808	88.7
Union of South Africa (1951) ^m	453	654	69.3

- a. Algiers agglomeration and rest of Department of Algiers.
- b. Sandakan Town and rest of British North Borneo.
- c. Infants 0-1 per 1,000 females 16-45 for Rangoon City and three adjoining rural districts.
- d. Infants 0-1 per 1,000 females 15-44 for Tehran City and Tehran Province minus city.
- e. Kingston and urban part of St. Andrew and rest of Jamaica.
- f. Tripoli and rest of Libya.
- g. Singapore and Malaya.
- i. Port Louis District and rest of Mauritius.
- h. Urban and rural Katmandu District.
- j. Infants 0-7 per 1,000 females 15-60 in rural and urban Ibadan District.
- k. Infants and children 0-9 per 1,000 females 10-39 for four urban municipalities in East Bengal and all East Bengal.
- l. Infants 0-4 per 1,000 "females over puberty, not past childbearing" in Khartoum Town and rest of Khartoum Province.
- m. "Natives" only.

Sources: See appendix note.

tries are rural-urban age distributions available over any extended period.

Another more indirect approach to measuring the effect of urbanization on fertility ratios is to compare the relative levels of national fertility ratios and percentages of the population classified as urban. For the period 1930 to 1960, the author collected one hundred matched observations for these two variables. To detect any time trends present, the data were broken into three decennial periods, 1931 to 1940, 1941 to 1950 and 1951 to 1960. In all cases, there was a negative correlation, but the values of the coefficients actually fell with time, being respectively $-.62$, $-.21$, and $-.15$. (Only the first of these is significant at $p = .05$.) This presumably implies that the association between urbanization and fertility ratios has been decreasing in strength with the passage of time.¹¹

Studies in depth of several of those few populations for which urban and rural fertility ratios can be computed over the same period (1930 to 1960) also lead to this conclusion. In the case of Mexico, urban changed from 33 per cent in 1930 to 43 per cent in 1950, yet the fertility ratio rose from 575 to 626. Trends in the relative fertility ratio level of urban places compared to rural places in Mexico during this period show increases in urban fertility and a narrowing of what were fairly large differentials in the earlier periods. Similar trends are observable in India and elsewhere.¹²

Thus, it is possible to reconcile the results shown in Table 1 with the conclusions reached by the earlier investigators whom we have cited. What was a fairly strong relationship between fertility ratios and urbanization in the period before the Second World War has changed into a much more moderate one in the recent past. Explaining this apparent trend requires a bit more ingenuity, however.

¹¹ The sources of these data are contained in the appendix note.

¹² See Robinson, Warren C. and Robinson, Elizabeth H.: Rural-Urban Fertility Differentials in Mexico, *American Sociological Review*, February, 1960, 25 (1): 77-81; Robinson, Warren C.: Urban-Rural Differences in Indian Fertility, *Population Studies*, January, 1961, XIV (3): 218-234.

THE INFANT MORTALITY BIAS

Nearly all studies of differential fertility in the lesser-developed nations are in terms of the fertility (or child-woman) ratio. (Table 1 above also employs this ratio.) This measure, the number of infants and children aged 0-4 per 1,000 females aged 15-49, is usually employed where census data are available but not birth registration data. And this is typically the situation in the lesser-developed nations. It is well-known that the fertility ratio is subject to some serious biases.

This index is plainly a makeshift, designed to furnish a measurement of fertility when birth statistics are lacking. It is derived entirely from the data by age in one census. Though the child-woman ratio is useful chiefly because of this fact, it demands caution for the same reason. Instead of births, the ratio is based on the *survivors* of previous births; it includes the survivors of births during the five years preceding the census, and unavoidably includes the effects of infant and childhood mortality during this period.¹³

In life table terms, it is a matter of the ratio of $5(1_0)$ to ${}_5L_0$, which ratio in turn reflects the effect of ${}_5q_0$, and in particular the value of ${}_1q_0$, which approximates the infant mortality rate. Two populations with the same true birth rates but with different infant mortality rates will display different values for their fertility ratios.

It is common knowledge that infant and childhood mortality risks are often higher in the large urban agglomerations of lesser-developed areas than is the case for the rural districts. An analogy with Western demographic history is frequently suggested.

The excess of urban infant mortality in countries that are now in the process of industrialization is not difficult to understand.

¹³ Barclay, George W.: *TECHNIQUES OF POPULATION ANALYSIS*. New York, John Wiley and Sons, Inc., 1958, p. 172. Hauser has suggested use of an adjusted "effective fertility ratio." See *Demographic Indicators of Economic Development, Economic Development and Cultural Change*, January, 1959, VII (2): 106.

Conditions in their large urban centres may resemble those in western cities at an earlier date, before many advances had been made in urban living conditions and in the availability of medical and health services. . . . When first studied, infant mortality rates were found to be much higher in urban than in rural areas. In Sweden at the middle of the last century the rate was about 50 per cent higher in cities than in the rural areas. However, once improvements in health standards, housing facilities, and other social and economic conditions were introduced, the rate fell more rapidly in the cities than in the country. By 1920, the urban infant mortality rate no longer surpassed that in rural areas. A similar trend was shown in the United States.¹⁴

It is extremely difficult to put together reliable infant mortality data for the lesser-developed nations. Typically, as we have noted, registration data on births and infant deaths are simply not available. Nevertheless, for particular cities and countries some comparisons can be made. Table 2 presents decade average annual infant mortality rates for 13 large urban areas compared to their national averages.¹⁵

For the decade 1930–1939, only one city was below its national average; three others showed virtually no difference from their national averages; in the remaining nine cases, the cities all showed infant mortality rates above those of the nation as a whole. In five of these, the differentials were 35 per cent or more.

By the decade 1950–59, the differentials had changed rather sharply. Four cities remained higher than their national average, but only one of these by as much as 20 per cent, with the other three differentials being on the order of ten per cent. Five cities were virtually identical with their national averages and four cities were below their national averages.

¹⁴ United Nations, Department of Economic Affairs: *DEMOGRAPHIC YEARBOOK 1952*, p. 19; *see also* UNESCO: *URBANIZATION IN ASIA AND THE FAR EAST*, pp. 34–35.

¹⁵ The sources of these data are discussed in the appendix note.

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Considering each city separately, in eleven of the thirteen, the city rate as a per cent of the national average rate fell between 1930 and 1960. Where the city rate was below the national rate in 1930-1939, it fell even further by 1950-59; where there was no difference in 1930-39, a difference emerged by

Table 2. Decade average infant mortality rates, selected non-western countries and their major cities, 1930-1939, 1940-1949, 1950-1959.

	1930-1939		1940-1949		1950-1959	
	<i>Infant Deaths per 1,000 Live Births</i>	<i>City Rate as Per Cent of National Rate</i>	<i>Infant Deaths per 1,000 Live Births</i>	<i>City Rate as Per Cent of National Rate</i>	<i>Infant Deaths per 1,000 Live Births</i>	<i>City Rate as Per Cent of National Rate</i>
<i>Latin America</i>						
British Guiana	139.6		99.2		72.2	
Georgetown	131.9	94.5	88.6	89.3	88.4	122.4
Argentina	98.5		79.7		63.8	
Buenos Aires	55.8	56.6	40.1	50.3	33.3	52.2
Colombia	141.0		147.1		109.5	
Bogota	192.9	136.8	162.9	110.7	104.0	95.0
Mexico	131.4		112.0		85.7	
Mexico City	151.5	115.3	142.3	127.1	84.8	99.0
Uruguay	96.7		81.1		64.5	
Montevideo	99.9	103.3	63.8	78.7	43.1	66.8
El Salvador	132.3		108.3		79.8	
San Salvador	196.9	148.8	135.9	125.5	90.0	112.8
<i>Asia</i>						
Ceylon	173.9		122.6		73.9	
Colombo	171.8	98.8	133.6	109.0	83.3	112.7
India	169.0		150.0		110.0	
Bombay	247.6	146.5	189.9	126.6	121.8	110.7
Philippines	147.5		96.0		100.1	
Manila	146.2	99.1	143.2	149.2	65.6	65.5
Thailand	95.9		91.0		61.5	
Bangkok	164.4	171.4	126.4	138.9	61.7	100.3
Malaya	156.6		100.5		83.3	
Singapore	186.1	118.8	145.9	145.2	57.6	69.1
<i>Africa</i>						
Algeria	86.0		96.4		92.0	
Algiers	145.0	168.6	138.0	143.2	97.8	106.3
Egypt	162.8		152.7		166.1	
Cairo	198.8	122.1	205.7	134.7	166.4	100.2

Sources: See appendix note.

1950-59; where the city rate started out above the entire country, the situation either reversed itself or was sharply diminished by the end of the period. Only the cases of Georgetown, British Guiana, and Colombo, Ceylon, run counter to this trend, and in both these cases the movements are of a moderate and uncertain sort.

Thus, one finds that the trend in rural-urban infant mortality differentials runs exactly counter to the trend in rural-urban fertility ratio differentials. As the relative level of urban infant mortality has fallen, the relative level of urban fertility ratios has risen. In both cases, previous urban-rural differentials have been narrowing.

DIFFERENCES IN THE PER CENT OF FEMALES MARRIED

Marriage patterns also show rural-urban differentials, with the urban females showing lower percentages of their number married at nearly all ages. To adjust for this difference, where possible investigators employ the marital fertility ratio (that is, infants and children 0-4 per 1,000 married females 15-49) instead of the fertility ratio. The usual effect of this adjustment in the denominator is to reduce somewhat the apparent rural-urban differences.¹⁶

Other factors may also introduce differentials in the fertility ratios of two populations which do not in fact represent differences in the true fertility. These are differential error in rural-urban census enumeration or age reporting inaccuracies; and internal migration between rural and urban places causing enumeration of mothers and children separately or away from their usual places or residence.¹⁷ Unfortunately, almost no evidence whatsoever exists on the relative importance of these factors in the areas under consideration.

¹⁶ For example, *see* United Nations, Department of Social Affairs: *THE DETERMINANTS AND CONSEQUENCES OF POPULATION TRENDS*. New York, 1953, page 95, paragraph 137.

¹⁷ For an excellent example of one type of migration bias, *see* Kemp, L.: A Note on the Use of the Fertility Ratio in the Study of Rural-Urban Differences in Fertility, *Rural Sociology*, 1945 X, (3): 312-313.

Table 3. Fertility ratios and related factors, selected Asian, African and Latin-American countries, 1930-1960.

		<i>Fertility Ratio (Infants and Children 0-4 per 1,000 Females 15-49)</i>	<i>Infant Mortality Rate (Deaths at Age 0 per 1,000 Live Births)</i>	<i>Per Cent Urban (Various Definitions)</i>	<i>Per Cent Married (Per Cent of Females 15 and Over Who Have Ever Married)</i>
<i>1930-1945</i>					
Egypt	1937	547	163.7	25.1	86.3
Mauritius	1944	479	148.6	28.5	73.6
Jamaica	1943	475	105.6	18.2	50.7
Mexico	1940	580	127.6	35.1	70.6
Puerto Rico	1940	606	122.6	30.3	68.6
Chile	1930	528	221.1	49.4	56.8
	1940	480	234.1	52.4	57.6
Colombia	1938	628	146.7	29.1	46.3
Venezuela	1941	593	129.6	39.3	31.7
Hong Kong	1931	354	574.0	88.4	81.0
India	1931	629	179.1	11.1	96.4
Palestine	1931	823	161.5	43.4	83.7
<i>1946-1960</i>					
Algeria	1948	633	99.7	23.6	82.8
	1954	743	85.3	22.9	83.4
Egypt	1947	546	146.6	30.1	85.1
Mauritius	1952	742	110.1	34.9	82.0
Costa Rica	1950	686	93.1	33.5	61.4
El Salvador	1950	623	96.8	36.5	59.0
Barbados	1946	422	163.5	39.6	52.0
British Honduras	1946	508	134.4	55.8	62.8
Bermuda	1950	490	42.3	11.6	68.6
Guatemala	1950	695	110.1	25.0	69.2
Nicaragua	1950	650	92.4	34.9	57.8
Panama	1950	695	55.9	36.0	64.4
Puerto Rico	1950	725	73.9	40.5	72.7
Argentina	1947	423	79.7	62.5	57.3
Brazil	1950	653	171.0	36.2	64.3
British Guiana	1946	565	112.3	27.6	69.4
Chile	1952	517	153.5	60.2	62.7
Colombia	1951	691	130.7	38.0	59.8
Ecuador	1950	705	123.1	28.5	66.0
Paraguay	1950	694	63.2	34.6	53.1
Venezuela	1950	711	94.0	53.8	56.8
Ceylon	1946	543	133.6	15.4	78.8
	1953	810	80.1	15.3	78.5
India	1951	549	130.0	17.3	93.6
Malaya	1947	565	94.5	26.5	86.9
North Borneo	1951	579	117.0	13.4	83.5
Sarawak	1947	572	75.0	10.8	82.6
Singapore	1947	532	174.3	72.5	76.9
	1957	844	51.2	63.1	62.5
Thailand	1947	626	95.2	9.9	76.4
Fiji Islands	1956	832	47.5	18.3	77.7
Western Samoa	1956	901	41.3	18.7	62.9

Source: See appendix note.

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INTERACTION AMONG INFANT MORTALITY, URBANIZATION AND PER CENT MARRIED

In an effort to test the relative importance of each of these factors—urbanization, infant mortality differentials and per cent married—on the fertility ratio, a group of 44 observations were obtained matching each of these four variables for lesser-developed countries in the period 1930 to 1960. Table 3 presents these data.¹⁸ These data were then analyzed in three separate correlations: first, for the entire period; second, for the period 1930 to 1944; and third, for the period 1945 to 1960. The simple, multiple and partial coefficients are presented below:

	1930-1944	1945-1960	1930-1960
r_{12}	-.57*	-.53*	-.53**
r_{13}	-.42	-.17	-.26
r_{14}	+.12	-.02	+.07
r_{23}	+.86**	+.29	+.54**
r_{24}	+.27	+.07	+.11
r_{34}	-.03	-.51**	-.31*
$r_{1,234}$	—	—	.55**
$r_{12,34}$	-.63*	-.50**	-.50**
$r_{13,24}$	+.43	+.01	+.10
$r_{14,23}$	+.51	+.03	+.18
$n =$	12	32	44

* significant at $p = .05$
 ** significant at $p = .01$

x_1 = Fertility ratio (infants and children 0-4 per 1,000 females 15-49)

x_2 = Infant mortality rate (deaths at age 0 per 1,000 live births)

x_3 = Per cent urban (various definitions)

x_4 = Per cent married (females 15 and over ever married)

In terms of simple correlation, a negative relationship between the fertility ratio (X_1) and per cent urban (X_3) appears, with the earlier period showing stronger association than the later. Per cent urban is, however, strongly positively correlated with infant mortality, particularly in the earlier period.

¹⁸ The source of these data is discussed in the appendix note.

There is also a significant negative correlation between per cent urban and per cent married in the later period. Holding constant the effect of these other two independent variables (X_2 and X_4), the relationship between the fertility ratio and per cent urban is altered drastically. A strong positive correlation is observed in the earlier period, meaning that the greater the degree of urbanization the higher the fertility ratio, while virtually no relationship at all is shown in the later period.

The simple correlation of the per cent of females married (X_4) shows no strong relationships with either the dependent variable (X_1) or the other independent variables. The strongest relationship is, as noted above, a negative correlation with per cent urban (X_3) in the later period. Holding constant the effect of infant mortality and per cent urban, a fairly high positive correlation is revealed between the fertility ratio (X_1) and per cent married in the earlier period. This implies that the higher the per cent of females married, the higher the fertility ratio in this period, but the relationship apparently weakened over time.

Infant mortality (X_2) shows consistently high negative simple correlation with the fertility ratio (X_1) for both time periods. As noted above, infant mortality also shows high positive correlation with per cent urban (X_3) especially in the earlier period. Holding constant the effect of the other independent variables (X_3 and X_4) increases the correlation between infant mortality and fertility ratio, the sign remaining negative, for earlier period, and lowers it slightly for the later.

The multiple correlation of the fertility ratio (X_1) and all three independent variables (per cent urban, infant mortality, and per cent married) shows a relationship for the whole period only slightly higher than that for infant mortality alone.

Thus, considering the separate and joint effects of these three important factors likely to cause differences in the fertility ratios among countries, the infant mortality rate appears to dominate. What looks like a strong association between per cent urban and fertility ratios in the earlier period is actually an

indirect measurement of the infant mortality-fertility ratio association. The correlation between infant mortality and urbanization has weakened over time and so has the apparent association between urbanization and fertility ratios. Per cent married seems to be growing more strongly associated with per cent urban, the association being negative in sign. Overall, its correlation with fertility ratios is positive and more important than per cent urban, though much less important than the infant mortality rate.

A SUGGESTED INTERPRETATION

The above statistical evidence must be interpreted cautiously. In particular, there is the dangerous possibility that the accuracy of the infant mortality rates employed above varies from country to country and has changed over time. Nevertheless it would require a massive and one-sided accumulation of such inaccuracies to negate totally the rather strong associations and tendencies demonstrated in our data. A statistical pattern does emerge which makes good sense logically and which fits with other bits of evidence bearing on the topic.

To summarize, our survey of recent rural-urban fertility ratios with selected countries makes it clear that there is no uniformity in differentials. In about half the cases, urban fertility is below rural, in others there are no apparent differences, while in yet others urban fertility appears to be higher than rural fertility.

Making an adjustment for the infant mortality bias contained in these fertility ratios, it is possible to interpret this diversity of experience. For one group of countries, fertility ratios for urban and rural show differences which are, in all probability, mostly the result of differences in infant mortality. In another group of countries, where infant mortality differences are small urban to rural, virtually no fertility ratio differences are observed. In a third group of countries, what may be called a genuine urban-rural fertility differential has

emerged, because of the lower incidence of marriage among urban females.

The infant mortality bias contained in the fertility ratio also may explain the apparent conflict between our survey of lesser-developed rural-urban fertility differentials and the earlier results of Jaffe, Tietze and others. Given that: (a) urban infant mortality was several decades ago generally higher than rural infant mortality and (b) these infant mortality differentials have been narrowing over time, one would naturally have found more generally prevalent lower urban fertility ratios several decades ago than today. This may also provide the explanation for the apparent rise in urban fertility which has puzzled some observers.¹⁹

This absence of a substantial rural-urban fertility gap in many non-Western nations is merely another indication that urbanization in Asia and Africa is proceeding along different lines from those followed by urbanization in the West and at a different rate of speed.

Many cities in Asia and the Far East, in contrast with Western cities, often retain strong village characteristics or those of an agglomeration of villages. In general they tend to be characterized by the coexistence of two distinctive areas: (i) the Western type area, and (ii) the indigenous type area consisting of an agglomeration of villages. In consequence, although a rather small elite indigenous population appears in Asian cities with the same characteristics as those possessed by urban residents in the West, the mass population of many Asian cities is resident in village agglomerations and tend to retain 'folk' characteristics. The characteristics of the urban residents, identified with such dichotomies of continua as the 'folk-urban,' 'rural-urban' or 'community-society' categories, do not hold for the mass of residents in many Asian cities.²⁰

¹⁹ For example, United Nations, Department of Economic and Social Affairs: *DEMOGRAPHIC YEARBOOK, 1952*, p. 16.

²⁰ UNESCO, *URBANIZATION IN ASIA AND THE FAR EAST*, pp. 34-35.

However, in many of the other Asian and Latin nations, there is the encouraging fact that the average age at first marriage for females is rising in the cities and that relatively fewer urban females marry than do rural females at the same ages. The effect of these differences on urban-rural fertility is slight so far. But, they present at least one symptom of a kind of demographic "rationalization." Urbanization will not solve the problem of fertility for the lesser-developed nations over-night, but it is much too early to give up on it altogether.

APPENDIX NOTE ON SOURCES OF DATA EMPLOYED

The urban and rural fertility ratios used in Table 1 are based on the published age distributions of the appropriate national census reports. In some cases an urban approximation was used but these cases are noted in the text.

The infant mortality rates shown in Tables 2 and 3 are from the following sources: United Nations, Department of Economic Affairs: DEMOGRAPHIC YEARBOOK, 1951, Table 19, pp. 328 ff; DEMOGRAPHIC YEARBOOK, 1959, Table 28, pp. 596 ff; World Health Organization: ANNUAL EPIDEMIOLOGICAL AND VITAL STATISTICS, 1939-1946, Part I, Table 46, pp. 83 ff; ANNUAL EPIDEMIOLOGICAL AND VITAL STATISTICS, 1947-1949, Part I, Table 23, pp. 137 ff; ANNUAL EPIDEMIOLOGICAL AND VITAL STATISTICS, 1950 Part I, Table 4, pp. 28 ff; ANNUAL EPIDEMIOLOGICAL AND VITAL STATISTICS, 1954, Part I, Table 35, pp. 396. Used also were issues of the annual public health, vital statistics, or other reports of the following territories: Aden Colony; Presidency of Antigua, Leeward Islands Colony; Republic of Argentina; Bahamas Islands; St. Lucia; St. Christopher-Nevis Presidency; St. Vincent; Dominica; Colony of Mozambique; Colony of Sarawak; Algeria; Venezuela; British Guiana; Ghana; Hong Kong; Burma; Barbadoes Islands; Bermuda; British Honduras; Colony of North Borneo; Ceylon.

The national average fertility ratios of Table 3 are those published in United Nations, Bureau of Economic and Social Affairs:

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DEMOGRAPHIC YEARBOOK, 1954, Table 7, pp. 236 ff; DEMOGRAPHIC YEARBOOK, 1959, Table 8, pp. 195 ff.

The percentages urban used in Table 3 are those published *in* United Nations, Bureau of Economic and Social Affairs: DEMOGRAPHIC YEARBOOK, 1960, Table 9, pp. 373 ff.

The percentages of females 15 and older who are married shown in Table 3 are those published *in* United Nations, Department of Economic and Social Affairs: DEMOGRAPHIC YEARBOOK, 1949-50, Table 5, pp. 168 ff; United Nations, Department of Economic and Social Affairs: DEMOGRAPHIC YEARBOOK, 1958, Table 6, pp. 138 ff.