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Mortality and Fertility Trends in Zaire

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ABSTRACT

In spite of the prominence of Zaire on the African continent, its demographic characteristics and trends have not received sufficient attention. A major reason has been the lack of data. The results of the 1984 Census, which are slowly becoming available, throw some light on the trends and differentials in mortality and fertility during the past three decades. Over this period, childhood mortality has declined significantly although large urban-rural differentials persist. The most impressive gains in childhood survival occurred in the post World War II period in regions experiencing rapid improvements in socio-economic conditions (i.e, the capital city of Kinshasa, neighboring Bas-Zaire, copper and diamond producing Shaba and Kasai-Oriental, respectively). By contrast, fertility has increased on average, which appears to be due to a rise in marital fertility, as polygamy, post-partum abstinence, breast feeding and sterility have been on the decline, without offsetting increases in the use of modern contraceptives. The direction and magnitude of changes in fertility are, however, not uniform across regions. Some regions (Kinshasa, Bas-Zaire) are characterized by declining/constant fertility, which is partly related to changes in nuptiality patterns, while others (Haut-Zaire, Equateur) experienced dramatic increases in fertility as sterility levels declined.

These and other findings confirm the heterogeneity of the Zairian population, which is consistent with marked regional, socioeconomic, geographic and ethnic diversity. Indeed, Zaire's regions have more in common -- in terms of demographic characteristics -- with adjacent areas across national boundaries than with each other. For example, broadly similar childhood mortality patterns were found between mining and non-mining regions of Shaba and neighboring Zambia, Kivu and ethnically akin Rwanda and Burundi, and Kinshasa and Congo. Also, the virtual stagnation of fertility in the Kivu is similar to trends found in Rwanda and Burundi, and the magnitude of the fertility increase in Equateur and Haut-Zaire was very similar to those found in Congo, Cameroon, and Central African Republic, which also experienced significant drops in sterility.

Further research is needed to improve our understanding of the determinants of childhood mortality and of fertility, which are essential in the formulation of population and public health policies. More research is also needed to confirm the patterns and trends in fertility discussed in this paper.

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SUMMARY AND CONCLUSIONS

1. This paper constitutes a first attempt at linking data from the 1955-57 Demographic Survey and the 1984 Census, in an effort to establish levels, trends, and differentials in mortality and fertility over the past three decades.[1] Data are analysed at the national, regional, and urban-rural (mortality only) level. The analysis is primarily intended to provide baseline estimates of mortality and fertility for monitoring the impact of Bank-supported projects (i.e., AIDS control project, Social Sector Adjustment Project) and for the construction of population projections, at both the national and regional levels.

2. The most striking feature which emerges from this analysis is the heterogeneity of the population with respect to various demographic characteristics, which is consistent with the marked regional, socio-economic, geographic and ethnic diversity. National averages mask regional and urban-rural differentials and the direction and magnitude of changes in mortality and fertility, implying that they must be used with extreme caution. As discussed below, the analysis also points to broadly similar demographic characteristics and trends between different regions of Zaire and ethnically akin regions of neighboring countries.

Mortality

3. During the past three decades childhood mortality has declined in Zaire and regional disparities have narrowed. The proportion of infants who failed to reach their fifth birthday q(5)[2] is estimated to have dropped from 25 to 20 percent during 1950-80. Given that the 1955 Survey data for some regions appear to have been underestimated, the magnitude of the mortality decline is most likely even more impressive. In the 1950-52 period q(5) varied from 18 (Haut-Zaire) to 36 percent (Kasai-Occidental), excluding Kinshasa; by the early 1980s, these regional differentials had narrowed to 18 to 23 percent. When considering the timing and pace of change in childhood mortality across regions, two distinct patterns emerge. In a first group of regions a rapid improvement in child survival took place after World War II, during a time of rapid socio-economic

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1. The analysis has been carried out on provisional data from the 10 percent sample of the 1984 Census and will be updated once the final figures are released.

2. While q(5) is used in the summary and conclusions to provide an indication of mortality trends, because of its robustness, the text also provides estimates of infant mortality rates and life expectancies.

development, and a relative slow-down occured during the 1970s, with q(5) leveling off at 12-20 percent. This group includes the capital city of Kinshasa, neighboring Bas-Zaire, diamond producing Kasai-Oriental and the copper mining region of Shaba. By the early 1980s these regions were the most urbanized and enjoyed the highest levels of education. In a second group of regions (i.e., Kasai-Occidental, Bandundu), the pace of improvement during the 1940s/50s was slower, but continued throughout the 1970s.

4. The 1984 Census data revealed dramatic urban-rural differentials in child mortality and worsening intra-regional differentials since the early 1970s. Excess rural mortality varies from 20 percent in Haut-Zaire and Kivu, to 60 percent in Shaba. An infant born in one of the mining towns of Shaba is expected to live on average 53.4 years, nearly 11 years more than his counterpart in rural areas. The Shaba region is characterized by a pattern of widening intra-regional differentials during the past decade. Child mortality in the copper belt (Lubumbashi, Kolwezi, and Likasi), already at very low levels in the early 1970s (q(5) of 14-15) continued to decline even further. In the predominantly rural sub-regions of Lualaba, Haut-Lomani, Haut-Shaba and Tanganika, however, the proportion of infants dying before 5 years of age climbed from 21-25 to 24-28 percent.

5. Levels and trends in childhood mortality in Zaire are broadly consistent with those in other countries in sub-Saharan Africa. The average 18-23 percent of children estimated to die in the first five years of life in the early 1980s is very similar to a range of 15-25 percent found for a group of sub-Saharan countries. Given the heterogeneity of the population in this vast country, regional patterns of childhood mortality have more in common with those in neighboring countries than in other regions of Zaire. Broadly similar childhood mortality patterns were found between mining and non-mining regions of Shaba and neighboring Zambia; Kivu and ethnically akin Rwanda and Burundi; and Kinshasa and the Congo.

Fertility

6. On average, fertility appears to have increased in Zaire during the past three decades, with the Total Fertility Rate (TFR) rising from 5.9 to 6.3. The direction and magnitude of changes in the level of fertility is not uniform across regions. Three broad categories of regions are identified, according to the level of fertility at the outset of the 1950s and the direction of change during the subsequent three decades. In a first group fertility levels were very high in the post-war period, and continued to increase even further; this group includes Bandundu, Shaba, and the two Kasais, where infertility declined. The second group consists of Equateur and Haut-Zaire, which started out with extremely low fertility rates and which experienced dramatic increases in fertility, as

childlessness, due to sterility, was reduced. For example, in some sub-regions of Equateur the percentage of childless women (25-34) were reported to drop from about 40 to 11 percent during the 1955-76 period. The third group includes Kinshasa, Bas-Zaire and Kivu, with declinining/constant fertility, in part related to a changing pattern of nuptiality, (i.e., increases in the proportion of single women), in particular in the first two regions.

7. A cursory look at the patchy information available concerning the determinants of fertility in Zaire suggests that the overall upward trend can be largely explained by a rise in marital fertility, as polygamy, post-partum abstinence, breast feeding and sterility have been on the decline, without offsetting increases in the use of modern contraceptives. Sociological/demographic studies have documented an erosion process which appears to have been set in motion with increasing modernization, in particular education of women, changes in traditional sex roles, changes in family structure, such as increased reliance on the nuclear family and declines in polygamy, a practice which fostered post-partum abstinence. Modernization appears to also be associated with a decline in the duration and intensity of breast feeding.

8. The pattern of fertility, depicted by schedules of age-specific fertility rates, is characteristic of the "broad peak", extended childbearing type of distribution, with fertility peaking at 25-29, and remaining relatively high even during the later childbearing years. The notable exception to this pattern is found in Haut-Zaire, where sterility has historically been a problem. Nationwide, fertility schedules have changed during the past three decades, with the contribution to total births of women in the first two age groups (15-19 and 20-24) declining, while that for women in the next two age groups increased. This is consistent with an apparent increase in the age at marriage.

9. The implied levels and trends in fertility based on the 1984 Census are broadly consistent with those in other countries in sub-Saharan Africa. The TFR of about 6.3 is comparable to levels in neighboring countries of Central Africa (i.e., Congo, 6.0, Angola, 6.5, Cameroon, 6.5) but lower than those prevailing in Eastern Africa (i.e., Uganda, 7.0, Malawi, 7.8, Rwanda, 8.3, Kenya, 8.0). The virtual stagnation of fertility in the Kivu is similar to trends found in Rwanda and Burundi. The magnitude of the fertility increase in Equateur and Haut-Zaire was very similar to those found in other countries where sterility levels were historically high and subsequently dropped (Congo, Cameroon, Central African Republic).

Data Sources, Estimation Techniques and Further Research

10. The availability of data from the 1984 Census of Zaire (10 percent sample), the first nationally representative demographic data in three decades, has opened up many possibilities for exploring demographic trends and patterns in one of the largest countries in sub-Saharan Africa. The analysis in this paper represents a modest step in this direction.

11. The paper uses indirect demographic estimation techniques for deriving childhood mortality estimates and for evaluating/adjusting the fertility data. Consistency tests carried out on the 1984 Census data, prior to application of these techniques, suggest that the quality appears to be reasonably good. The data used in the analysis were found to be both internally consistent and in line with the 1955-57 Survey, with a few minor exceptions, and the overall demographic trends discussed in the paper appear to be reasonably correct. On balance, mortality data appear better than the fertility data.

12. The findings in this paper raise a number of areas where further research is warranted. Two key areas are the proximate determinants of mortality and fertility, the former which is not addressed in this paper and the latter only in a cursory manner. First, while the availability of nationally representative data on childhood mortality has improved significantly, information on the factors explaining mortality differentials is poor or non-existent. A systematic analysis of the determinants of childhood mortality, at the national and regional levels, would appear essential in designing appropriate remedial actions. Second, further research is required, not only to confirm the patterns and trends in fertility discussed in this paper, but more importantly to improve our understanding of the proximate determinants of fertility, which is critical in the formulation of population policies and programs. Finally, the Census data represents a rich source of regional information, which could be used in identifying high-risk groups for targetted public health interventions.

I. INTRODUCTION

1. Zaire is the second largest country in sub-Saharan Africa in terms of area (2.3 million sq. km) and the third largest in terms of population[1] (31.7 million, 1986). In spite of its prominence on the African continent the study of long-term demographic trends in Zaire has been relatively neglected, which is in part due to lack of up-to-date, nationally representative data. A considerable amount of analytic work was carried out for the 1940-75 period, based on the 1955 and 1975-77 demographic surveys but even this analysis was limited in geographical scope since the 1975-77 EDOZA (Etude Demographique de l'Ouest du Zaire) Surveys only covered the Western regions of the country.

2. The recent availability of data from the 1984 Census (10 percent sample), the first nationally representative demographic data available in three decades, has opened up numerous possibilities for further analysis. This technical paper presents results of an assessment of levels and trends in mortality and fertility in Zaire, based largely on the Census data. The 1984 Census represents a rich source of demographic data, which remains to be fully tapped. The analysis presented below is primarily intended to provide baseline estimates of mortality and fertility for current and future Bank-supported projects (i.e., AIDS control project, Social Sector Adjustment Project) and for the construction of population projections.

3. The paper includes a review of levels and trends in mortality (Section II) and fertility (Section III) and an assessment of the quality of the age distribution data (Annex I). The mortality chapter is divided into two major sections: (a) a discussion of the procedures applied in making the child mortality estimates and related methodological issues (II.A) and (b) a review of levels, trends, and differentials in child mortality (II.B). The fertility chapter consists of a discussion of levels, patterns and trends (III.A), an assessment of the quality of the fertility data and adjustment based on the P/F ratio technique and stable population models (III.B). Sections II.B and III.A are likely to be of general interest to operational staff, while sections II.A and III.B would also be of interest to demographers.

II. MORTALITY

4. The 1984 Census collected retrospective data on children ever born and children surviving, which enabled us to make estimates of child mortality through the use of indirect estimation techniques. Information on children ever born and children surviving was also collected in the 1955 Survey; this data was used to assess long-term trends in child mortality,

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1/ Excluding South Africa.

by reaggregating district-level data to correspond to the 9 regions of Zaire in 1984. For carrying out consistency checks only some limited data was available from the EDOZA Surveys (1975-77), the principal source of recent demographic data for Western Zaire, before the 1984 Census.[2]

A. Estimating Child Mortality

5. Before proceeding to a discussion of levels and trends in child mortality this section summarizes the results of consistency checks carried out on the children ever born and children surviving data prior to application of the Brass child survival technique (para. 10). A common consistency check for the quality of the Children Ever Born (CEB) data is to plot average parities, by age group of mother.[3] The result is a measure of the average 'lifetime fertility' experience of the survivors of a birth cohort. Unless fertility rose at some time in the past, average parities should increase with age of mother. There are two potential sources of distortions in average parities, errors in: (i) the number of children reported and/or (ii) in the classification of women in particular age groups. A commonly found problem with the retrospective nature of the CEB data is that children who have left home or who have died are particularly likely to be omitted. Older women have been most often found to omit some of their live-born children; this tendency manifests itself in average parities that fail to increase rapidly enough as age increases and in some cases actually fall below that of younger women, even when there is no reason to suppose fertility has been rising.

6. The average parities (by region) from the 1984 Census are presented in graphic form in figures II.1a/1b. The pattern which emerges is quite common: a continous increase in average parities, with age of mother, for all groups except 45-49. For this last age group average parities are not much higher than those for the 40-44 age group in some regions (i.e., Bandundu, Kivu) and are in fact lower in most other regions (i.e., Equateur, Kasais, Shaba, and Haut-Zaire). The lower average parities for the 45-49 age group is most likely related to higher omission rates of CEB by older women, even though the possibility of rising fertility can not be ruled out.

7. It is interesting to note that average parities for the three youngest age groups in Equateur and Haut-Zaire, two regions which were particularly affected by high sterility historically (along with part of Kasai), are comparable to those in other regions, suggesting that childlessness due to sterility has been reduced. On the other hand,

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2/ The EDOZA Surveys were carried out between 1975 and 1977 in the four Western regions of Zaire (Kinshasa, Bas-Zaire, Kasai-Occidental, and Bandundu), excluding the five largest cities (Matadi, Kikwit, Bandundu, Kananga, Mbandaka), which were surveyed separately.

3/ Average parities are computed by dividing the total number of children ever born by the number of women in each of the 7 reproductive age groups (15-19 through 45-49).

parities for all other age groups tend to be lower than in other regions, since the lifetime fertility of older women has been seriously impaired by venereal infections, leading to sterility.[4]

8. For Kinshasa, parity data was also available from four other demographic surveys.[5] This data is presented in graphic form in Figure II.1c. Each set of data represents the fertility experience of different birth cohorts. A comparison of this data is rendered difficult by lack of information on changes in migration over this period.[6] Nevertheless, it is interesting to note that the overall shape of the average parity curves from the two most recent sources (Census and CPS) is broadly similar even though the implied level is consistently higher in the CPS at all age groups, except 45-49. This difference is most likely attributable only to sampling differences between the Census and CPS.

9. A second consistency check for the CEB data is to calculate proportions of children dead, by age of mother. As can be seen in figures II.3a/3b, the proportions of children dead, increase with the age of mother, implying that there is no apparent evidence of omission of dead children. The only exception is the data for the 15-19 age group, which is usually disregarded since the proportion of high-risk first births tends to be higher and the total number of events is generally very small. The lowest proportions of children dead were found in Kinshasa and Bas-Zaire while the highest were recorded in the Kivu and Kasai-Occidental. (Figure II.3a)

10. To get a better picture of levels and trends in child mortality, the Brass child survival technique was used. This procedure involves converting the proportions dead of children ever born to mothers in the reproductive age groups (15/19 to 45/49) into estimates of probability of dying before reaching certain exact childhood ages, and relating these to

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4/ In the post-war period of the colonial regime, venereal diseases as a health problem and as a factor in infertility became a national issue and large scale programs were launched to bring them under control, which apparently spared younger women from fecundity impairment caused by venereal infections; see Romaniuk, "Increase in Natural Fertility During the Early Stages of Modernization: Evidence from an African Case Study, Zaire", Population Studies, 1980.

5/ These included: the 1955 Survey, 1967 Demographic Survey, 1975 EDOZA Survey and the Contraceptive Prevalence Survey (CPS) of 1982-84.

6/ Average parities for a city like Kinshasa, experiencing heavy influxes of migrants, may be inflated by arrival of high parity rural women.

equivalent mortality levels in the Coale-Demeny life tables.[7] The version of the model used here (Coale and Trussell, 1977) also allows for dating the child mortality estimates, assuming that mortality has been changing in a linear fashion in the recent past.[8]

11. One of the first steps in application of this procedure is selection of the most appropriate Coale-Demeny life table family. The three families considered included North, South and West, the first two being commonly used for sub-Saharan populations. The North models have infant mortality rates which are low relative to child mortality, and relatively high mortality in later childhood, adolescence and adulthood up to 60; the South models have high mortality under 5, low mortality between 40 and 60, and high mortality over 65; while West comprises a large set of residual tables, without these special features. The mortality estimates are broadly consistent when using either North or West, while the application of the South model yields significantly different results in both levels and trends. The use of either North or West models yields very similar estimates of the proportion of infants dying before their fifth birthday, q(5), and life expectancy at birth, e(0); the key difference lies in the proportion of infants failing to survive to one, q(1), which tends to be somewhat lower when using the North family. The similarities between North and West would suggest ruling out one of them through an elimination process. We therefore drop the West family from consideration and retain North since it appears to provide the best consistency between data sets, and we have reasons to believe that the implied pattern of mortality is more appropriate.[9] Use of the North model has two further advantages, (i) it has been used in earlier studies; and (b) it facilitates cross country comparisons, since this model has often been used for demographic analyses in neighboring countries. The issue which remains to be answered is whether North or South is more appropriate for Zaire.

12. The implied estimates in child mortality derived from the North and South families are presented below. For the 1970s/early 80s the

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7/ The Coale-Demeny models are based on a set of life tables by sex recorded for actual populations before the mid 1960s. They are divided into four distinct mortality patterns (North, South, East and West), referring to the regions of the world from which the tables were derived. The levels run from 1 to 24, with increasing increments of 2.5 years in female life expectancy from one level to the next.

8/ For further details, see Manual X, Indirect Techniques for Demographic Estimation, United Nations, N.Y., 1983.

9/ While information on the pattern of mortality in Zaire is scanty, it appears that child mortality (1-4 year olds) is as serious a problem as infant mortality, if not more. Studies have documented that the weaning period tends to be associated with particularly high mortality levels. See Morbidite et mortalite Infantiles et Juveniles dans les Grandes Villes du Zaire, Avril 1988; Morbidite et Mortalite Infantiles et Juveniles a Kinshasa, Avril 1988, Departement de la Sante et des Affaires Sociales, Fond National Medico-Sanitaire, UNICEF.

estimates based on the North family suggest only a very slight improvement in child mortality (a total increase of 1 year in life expectancy or .4 of a mortality level), while those based on the South family indicate a major improvement (an increase of 5 years in life expectancy, equivalent of 2 mortality levels).[10] The improvement in child mortality during the 1940s/early 50s, as measured in equivalent Coale-Demeny mortality levels, was commensurate with annual increases of .5 and .8 years in life expectancy, when using the North and South models, respectively. While the implied reductions in child mortality using the South models are theoretically possible they appear unlikely. Moreover, use of the South model implies no mortality decline from the early 1950s to the 1970s, which also appears unlikely. The South model is therefore not considered further. The following discussion of regional levels and trends in child mortality is therefore based on the North models. It should be remembered, however, that estimates of the proportion of children dying during their first five years of life, q(5) and life expectancy, e(o), are more robust than estimates of the Infant Mortality Rate, q(1), which are somewhat more tentative.

Table 1.1: Mortality Levels in Coale-Demeny Model Life Tables Consistent with the Childhood Mortality Estimates, q(x)

	Age x	Probability of Dying Between Birth and Age x (qx) Using North	Using South	Date to which (qx) Refers	Coale-Demeny Level North	South
1984	1	0.158	0.153	1983	(9.8)	(11.6)
	2	0.159	0.167	1982	12.3	14.2
	3	0.172	0.183	1980/81	12.7	14.3
	5	0.200	0.206	1978/79	12.7	13.9
	10	0.236	0.233	1976	12.5	13.4
	15	0.262	0.257	1973/74	12.1	12.8
	20	0.289	0.285	1970/71	11.9	12.2
1955	1	0.137	0.131	1954	(11.3)	(13.7)
	2	0.178	0.187	1953	11.2	12.8
	3	0.210	0.228	1950/51	10.8	11.9
	5	0.261	0.274	1948	10.0	10.8
	10	0.325	0.326	1945	9.2	9.6
	15	0.322	0.320	1942/43	10.0	10.3
	20	0.368	0.367	1939/40	9.1	9.3

10/ The estimate for q(1), which implies very high mortality (associated with a lower level in the Coale-Demeny system), is omitted for the purpose of establishing these trends.

B. Levels and Trends in Child Mortality

13. Regional Differentials Table 1.2 below summarizes regional results of the infant and child mortality estimates derived from the 1955 Survey and 1984 Census, by application of the Brass technique.[11] The mortality estimates for the 1950-52 period indicate both very high levels and large regional differentials: excluding Kinshasa, the infant mortality rate varied from 111 (Haut-Zaire) to over 213 (Kasai-Occidental), and the percentage of children dying in the first five years of life, q(5), was within a range of 18-36 percent.[12] The expectation of life at birth was estimated at between 32 (Kasai-Occidental) and 53 (Kinshasa). During the subsequent three decades child survival probabilities in Zaire improved significantly and regional differentials became less marked.[13] By 1980/81 infant mortality rates, excluding Kinshasa, ranged from 106 to 136 and the proportion of children dying in the first five years of life from 18 to 23 percent in Bas-Zaire and Kivu, respectively. These estimates are broadly consistent with the proportion of infants estimated to die in the first five years of life in a group of sub-Saharan countries, found to be in a range of 15 to 25 percent in the late 70s.[14] The expectation of life at birth varied from 44 (Kivu) to 57 years in (Kinshasa), with the majority of the regions recording rates of about 47-48 years.

11/ The proportions of children dying in the first 5 years of life, q(5), are presented in graphic form in figures II.5a/5j.

12/ The mortality estimates for Haut-Zaire (IMR of 111) and Shaba (IMR of 115) appear low, however, and imply a substantial amount of underreporting of dead children. The simple consistency check of plotting proportions of children dead by age of mother revealed, in fact, a tendency for omission; see figure II.4b. Adjustments carried out on the reported IMR by Romaniuk led to estimated IMRs of 157 and 146 for Haut-Zaire and Shaba, respectively; see La Fecondite des Populations Congolaises.

13/ In the case of Haut-Zaire and Shaba the two data sets imply an increasing trend in child mortality over the 1940-80 period. As mentioned above, however, the implied levels of mortality based on the 1955 Survey are most likely unreliable since there appears to have been significant underreporting.

14/ Hill, Althea and Hill, Kenneth, "La mortalite en Afrique: Niveaux, tendances, differences et perspectives", L'etat de la Demographie Africaine, Union Internationale pour l'Etude Scientifique de la Population, 1988.

Table 1.2: Trends in Child Mortality a/

(North Family)

Region	Date of Reference	Both Sexes: Estimated CD North Level	Both Sexes: Infant Mortality Rate q(1)	Both Sexes: Percentage of Children Dying in first 5 yrs. of life q(5)	Both Sexes: Expectation of Life at Birth e(0)
KINSHASA	1950.5	14.9	94.4	15.4	52.9
	1968.2	16.3	79.4	12.6	56.4
	1981.0	16.5	77.1	12.2	57.0
BAS ZAIRE	1951.5	9.1	169.1	28.5	38.6
	1980.8	13.8	106.4	17.6	50.2
Matadi	1981.1	17.8	64.8	10.0	60.0
EQUATEUR	1950.9	11.0	141.1	23.9	43.3
	1980.5	12.7	119.1	20.0	47.5
Mbandaka	1980.7	15.8	84.6	13.6	55.1
Zongo	1979.5	15.7	85.7	13.8	54.9
KASAI-OCCIDENTAL	1950.6	6.5	213.4	35.6	32.2
	1980.6	11.6	133.1	22.5	44.8
Kananga	1980.9	14.7	96.1	15.7	52.5
KASAI-ORIENTAL	1950.4	10.3	150.4	25.4	41.7
	1980.5	12.8	117.2	19.7	47.9
Mbuji-Mayi	1980.5	15.1	92.2	15.0	53.4
SHABA	1950.1	13.0	115.1	19.3	48.3
	1980.4	12.3	123.8	20.9	46.6
Lubumbashi	1980.7	16.2	80.5	12.8	56.1
BANDUNDU	1951.3	9.1	168.4	28.4	38.7
	1980.8	12.4	121.9	20.5	46.9
Bandundu City	1981.0	17.0	72.1	11.3	58.2
HAUT-ZAIRE	1949.9	13.4	110.7	18.4	49.2
	1980.3	12.4	122.7	20.7	46.8
Kisangani	1980.5	14.1	102.5	16.9	51.1
KIVU	1950.5	9.2	166.8	28.1	38.9
	1980.7	11.3	136.2	23.0	44.2
Bukavu	1981.2	13.5	108.9	18.1	49.6
ZAIRE	1950.6	10.6	145.8	24.6	42.5
	1980.6	12.6	120.4	20.2	47.2

a/ The data refers to the average of women aged 20-24, 25-29, 30-34, based on the Brass method for estimating child mortality.

14. While it is clear that childhood mortality in Zaire has declined in both absolute and relative terms it is interesting to examine more closely the timing and pace of change across and within regions. A trend line has been fitted to the points from the 1955 Survey and 1984 Census. (figures II.5a/5j)[15] Two distinct patterns emerge. In some regions (i.e., Kinshasa, Bas-Zaire, Kasai-Oriental, Shaba) we note a rapid drop in child mortality, q(5), during the post-war period (mid 40s, early 50s) and a slow-down during the 1970s/early 80s, leveling off at 18-20 percent (12 percent in the capital). It is worth noting that these regions, which experienced the most rapid improvements in child survival, have historically been relatively well off socio-economically.[16] In a second group of regions (i.e., Kasai-Occidental, Bandundu) the rate of improvement during the 40s/50s was slower but continued throughout the 70s. The most impressive gains in life expectancy during the 1970s were made in Kasai-Occidental (4 years), and Bandundu (3.6 years), both regions which started from very low life expectancies in the early 70s (41 and 44 years, respectively).

15. The notable exception to this overall picture of improving child survival during the 1970s is found in Shaba (see figures II.5e and II.5j). The data suggest that while urban areas experienced an improvement in child survival rural zones recorded a deterioration; the proportions of infants failing to reach their fifth birthday in rural areas increased from 22.3 to 25.8 percent during 1971-82. Child mortality in the copper belt sub-regions of Shaba (i.e., Lubumbashi, Likasi, Kolwezi), estimated at only 14-15 percent at the outset of the 1970s, generally continued to decline throughout the decade. In the other sub-regions (Lualaba, Haut-Lomani, Haut-Shaba and Tanganika), on the other hand, child mortality was already quite high in the early 70s, and continued to deteriorate even further during the subsequent decade (see table 1.3 below). A similar pattern of child mortality differentials was documented in neighboring Zambia where the urbanized line-of-rail provinces showed a steady and steep mortality decline while the rural off-line-of-rail provinces showed gradual falls or none at all, with differentials widening over time.[17] The sub-region of Haut-Shaba, had similar childhood mortality rates to ethnically akin Luapula, Zambia in the early 70s, the most recent date for which comparable data is available, while the copper belt sub-regions of Zaire have similarly low childhood mortality rates to the neighboring Copperbelt province of Zambia. The relatively low childhood mortality rates in the copper belt sub-regions of Shaba reflect higher socio-economic levels, including the better availability of health services, which are often provided by the mining companies.

15/ The point referring to the 15-19 age group is excluded for reasons already discussed above.

16/ Kinshasa, Shaba, Bas-Zaire and Kasai-Oriental, which are the most urbanized regions of Zaire (i.e., 25-39 percent and 99.3 percent for the capital), enjoy the highest primary enrollment rates and child survival rates.

17/ Hill, Althea, The Demography of Zambia, Population, Health and Nutrition Department, World Bank, July 1985.

Table 1.8: Shaba: Percentage of Children Dying Prior to Fifth Birthday, q5, and Level of q5 Relative to National Level

Sub-Region	Percentage of Children Dying Prior to Fifth Birthday, q5		Level of q5 Relative to National Level	
	Early 1970s	Early 1980s	Early 1970s	Early 1980s
Lubumbashi	14.8	12.3	68	59
Likasi	13.9	13.4	64	64
Kolwezi	15.2	16.1	70	77
Lualaba	24.7	28.4	113	136
Haut-Lomani	21.1	25.5	97	122
Haut-Shaba	21.4	25.3	98	121
Tanganika	21.1	24.0	97	115
For Reference:				
ZAMBIA				
Copperbelt	10.8			
Luapula	23.0			

16. Finally, it should be noted that the data based on the 1984 Census also suggest an increase in child mortality in some regions of Zaire during the early 1980s. While it might be tempting to relate this apparent increase in child mortality to deteriorating socio-economic conditions during this period, extreme caution must be exercised in doing so, since the results might simply be an artifact of the methodology employed. The mortality estimate for the period of the early 1980s is based on data of women 20-24, who are experiencing a higher percentage of high-risk, first births than in the past and is therefore not reliable for the purpose of establishing these trends.

17. Urban/Rural Differentials The 1984 Census data revealed dramatic urban-rural differentials in childhood mortality, particularly in Shaba, Bandundu and Kasai Occidental, where excess rural mortality averaged 40-60 percent. (see table 1.4) For example, an infant born in one of the urban towns in Shaba (i.e., Lubumbashi, Kolwezi) is expected to live on average 53.4 years, or 10.7 years more than his counterpart in rural areas. The smallest mortality differentials (20 percent) were recorded in Haut Zaire and Kivu. Overall, rural areas of Zaire appear to be more homogenous in terms of childhood mortality levels than urban zones (table 1.4), which probably reflects the greater variability in socio-economic conditions between urban areas.

Table 1.4: Differentials in Childhood Mortality, q(5)
(North Family)

Region	Rural	Urban	Rural/Urban
Kinshasa	----	12.2	----
Bas-Zaire	n.a.	n.a.	n.a.
Equateur	20.7	15.9	1.3
Kasai-Occidental	24.1	16.6	1.5
Kasai-Oriental	21.4	16.4	1.3
Shaba	24.5	14.9	1.6
Bandundu	21.6	14.1	1.5
Haut-Zaire	21.3	17.5	1.2
Kivu	22.8	18.4	1.2

18. Recent surveys, carried out with UNICEF financing,[18] provide a basis for comparison of the levels of child mortality in the principal cities of Zaire. As can be seen from the table below, in all cases, except Matadi, the data based on the 1984 Census imply substantially higher levels of mortality. The authors of the UNICEF report in fact acknowledge that infant mortality rates are probably underestimated in these surveys, given the reported high rates of abortions and stillbirths.

Table 1.5: Proportions Dead of Children Ever-Born Alive to Women 15-49 years of age, urban areas

City	1984 Census	UNICEF Study	Ratio of Census/UNICEF
Matadi	11.5	12.4	.9
Boma	16.9	7.9	2.1
Mbandaka	14.9	9.0	1.7
Zongo	14.5	10.3	1.4
Kananga	17.6	10.9	1.6
Mbuji-Mayi	15.2	11.9	1.3
Lubumbashi	13.9	8.5	1.6
Likasi	13.7	12.7	1.1
Kolwezi	16.4	6.8	2.4
Bandundu	11.2	8.3	1.3
Kikwit	14.9	13.6	1.1
Kisangani	18.6	12.6	1.5
Bukavu	19.0	13.0	1.5

18/ Morbidite et mortalite Infantiles et Juveniles dans les Grandes Villes du Zaire, Avril 1988; Morbidite et Mortalite Infantiles et Juveniles a

19. To summarize, the estimates of child mortality indicate that, on average, the infant mortality rate declined from 146 to 120 (representing a 18 percent decline), the proportion of children dying in the first five years of life dropped from 25 to 20 percent, life expectancy increased from 43 to 47 years, over the period of roughly 1950-80. It should be noted, however, that these trends most likely underestimate the true magnitude of the improvement in child survival during the past three decades, in so far as the data for Haut-Zaire and Shaba from the 1955 Survey are underestimated. For example, if the adjusted IMR for Zaire from the 1955 Survey (173) made by Romaniuk is used the implied decline in the IMR would have actually been closer to 30 percent. Overall, however, these estimates appear quite reasonable and consistent with levels prevailing in neighboring countries of sub-Saharan Africa. (see table 1.6) Kinshasa, and to a lesser extent Bas-Zaire, appear to have similar proportions of infants (12 and 18 percent, respectively) failing to survive their first 5 years of life to those found in the Congo.[19] The estimated proportion of infants dying in the first five years of life in Kivu (23 percent) during the early 80s is fairly close to rates found in neighboring Burundi (22.4 percent, 1976) and Rwanda (21.7 percent, 1979). The life expectancy at birth of 47.2 years for the early 1980s was the same as regional averages for West and East Africa.

Table 1.6: Sub-Saharan Africa: Cross Country Comparisons

	q(5)			e(o)
Country	1950-54	1955-59	1975-80	1980-85
Zimbabwe			.10-.14	
Kenya	.20-.24	.20-.24		
Congo	.25-.29	.20-.24		
Senegal	.30-.34	.30-.34		
Rwanda		.25-.29	.20-.24	
Burundi			.20-.24	
Mali	.35-.39		.30-.34	
W. Africa				47.2
Central Africa				47.9
East Africa				47.2
Zaire	.25		.20	47.2
o/w:				
Kinshasa	.15		.12	
Bas-Zaire	.29		.18	
Kivu	.28		.23	
K.Occid.	.36		.23	

Source: Hill, Althea and Hill, Kenneth, "La mortalite en Afrique: Niveaux, tendances, differences et perspectives", L'etat de la Demographie Africaine, Union Internationale pour l'Etude Scientifique de la Population, 1988.

Kinshasa, Avril 1988, Departement de la Sante et des Affaires Sociales, Fond National Medico-Sanitaire, UNICEF.

19/ Childhood mortality in the Congo experienced a marked decline from the mid-1960s to mid-1970s, with q(5) falling from about 20 percent to 13-14 percent.

II. FERTILITY

20. The 1984 Census collected information on births during the preceding 12 months and the number of children ever born alive which allow the calculation of period and lifetime fertility indicators, respectively. The following section includes a discussion of the implied levels, patterns, and trends in fertility based on reported data; an assessment of the quality of the fertility data using the P/F method; and adjustment using both the P/F technique and stable population models.

A. Levels, Patterns and Trends in Fertility

21. Levels Based on reported data, the crude birth rate[20] for Zaire was estimated at 42, the general fertility rate[21] at 180, the total fertility rate[22] at 6 and the mean age of childbearing at about 30. At first glance these estimates appear reasonable, but somewhat on the low side, given levels frequently found in neighboring countries of East Africa. As can be seen from figure II.8a, the highest crude birth rates (47) were reported in the eastern (Kivu) and south-eastern regions (Shaba) and the lowest (37) in the capital and in the north-east (Haut-Zaire).[23] When using the total fertility rate, which is a better indicator of fertility,[24] the following pattern emerges: a TFR below the national average in Kinshasa and Haut-Zaire (5), the latter being a region where sterility has historically been a major problem (see para. 30), and a TFR above the national average in Kasai-Oriental, Shaba and Kivu (7). It is interesting to note that fertility in the Kivu is comparable to that in neighboring Burundi and Rwanda, to which it is ethnically and socio-economically very similar.

20/ The number of births per 1000 population.

21/ The number of births to women in the reproductive age groups (15-49) divided by the number of women in these groups.

22/ The average number of children that would be born alive to a woman during her lifetime if she passed through her childbearing years conforming to the age-specific fertility rates of a given year.

23/ The region of Haut-Zaire has historically had the lowest fertility levels in the country. The adjusted General Fertility Rate from the 1955 Survey was estimated at 145 (96 and 107 for the sub-regions of Bas-Uele and Haut-Uele), respectively, in comparison to a national average of 203. It is interesting to note that the 1955/56 Census of Sudan found that the region of Equatoria, which borders Haut-Zaire, also had the lowest Crude Birth Rate (36.6) in the country; see Demeny, Paul, "The Demography of the Sudan: An Analysis of the 1955/56 Census, The Demography of Tropical Africa, Brass, et., al., Princeton University Press, 1968.

24/ The TFR is a 'purer' measure of fertility since, unlike the CBR and the GFR, it is not influenced by the effects of the age structure.

22. **Patterns** Table A.2a presents schedules of age-specific fertility rates, by region, and figures II.6a/6b display these graphically. The fertility schedules peak at 25-29, and are characteristic of the "broad peak", extended childbearing type of distribution, with fertility remaining relatively high even during the later childbearing years. With the exception of Haut-Zaire, there is great similarity in the age pattern of the fertility schedules from one region to the next. It is worth noting that the fertility schedules have changed significantly during the last three decades. In 1955, the fertility schedules were characterized by higher fertility at the two youngest age groups and lower thereafter, with the distribution more heavily skewed to the right.[25] The mean age of childbearing, which is another indicator of differences in age patterns of childbearing, is calculated to have increased from 28 in 1955 to 30 in 1984.

23. Table 2.1 below converts the fertility schedules from the 1955 Survey and 1984 Census into percent distributions. As the schedule of fertility rates illustrates the contribution to total births of women in the first two age groups (15-19 and 20-24) has declined, (from about 40 to 28 percent), while that for women aged 30-34 and 35-39 has increased during the last three decades.

Table 2.1: Percentage of Total Fertility Experienced in Each Age-Group

Age Group of Women	1955 Survey	1984 Census
15-19	18.7	7.0
20-24	26.7	20.7
25-29	23.3	23.3
30-34	16.9	21.7
35-39	8.1	15.6
40-44	8.1	8.8
45-49	3.2	2.9
Total	100.0	100.0
Total Fertility Rate	4.96 a/	5.97 a/
	(5.91)	(6.30)

a/ Unadjusted

Note: Figures in parenthesis refer to adjusted TFRs.

25/ The difference in the fertility schedules may be due to a combination of factors: (i) declines in secondary sterility; and/or (ii) better reporting in 1984.

24. Trends While the overall pattern of fertility from the 1984 Census appears very reasonable and consistent with information concerning the proximate determinants of fertility (i.e., entry into sexual union at a relatively young age, long exposure period, and low contraceptive prevalence) the accuracy of the implied levels/trends in fertility remains to be evaluated. Information on lifetime fertility (i.e., average parities) can be useful for this purpose. The pattern which emerges from the analysis of reported mean parities (table 2.2) is similar to that of the fertility schedules: lower fertility in the first two age groups and substantially higher at all other ages in 1984. Caution must be exercised, however, before attaching too much weight to the accuracy of the percentage changes noted below since undoubtedly part of this difference in levels is due to improvements in reporting during the last three decades, as education levels of respondents increased.[26]

Table 2.2: Average Parities

Age Group of Women	1955	1984	Percentage Change 1955-84
15-19	.35	.27	-23
20-24	1.45	1.42	- 2
25-29	2.39	3.07	+29
30-34	3.25	4.52	+39
35-39	3.85	5.77	+50
40-44	3.85	6.27	+63
45-49	3.97	6.10	+54

25. While the national averages indicate that fertility appears to have declined at younger ages and increased at older ones it is important to look at regional variations. Information on average parities is summarized in table A.2b and illustrated in figures II.1a-2c.[27] The most comprehensive data for the 1955-84 period is available for Kinshasa.[28]

26/ In fact, as already discussed under the mortality section, the number of children ever born from the 1955 Survey was significantly underreported in some regions, implying that the average parities for 1955 are also underestimated.

27/ For the purposes of establishing trends the data for the oldest women is usually not used either because it is not available and/or not deemed reliable. The changes in parities are used for establishing broad trends only and not too much weight should be attached to specific numbers.

28/ Kinshasa has benefitted from four surveys and one Census.

The data suggests that fertility increased during 1955-67 at all ages, began declining, in particular at younger ages, as early as 1967, and continued dropping throughout the 1970s. The downward trend in fertility for the late 60s/70s is also confirmed by a recorded drop of 36 percent in the General Fertility Rate. While this dramatic drop during 1967-84 appears at first glance unlikely it is not totally implausible since Kinshasa has experienced a major change in the age pattern of nuptiality during the past decades, with large increases in the proportion of single women and corresponding declines in proportions married (table 2.3). A standardized Crude Birth Rate for 1984 was calculated which suggested that the CBR would have been close to 50 per thousand, or some 40 percent higher than the reported rate of 36.7 in the absence of a change in the nuptiality pattern.[29]

Table 2.8: Kinshasa: Distribution of Female Population 15 years and older, by marital status and proportion single, by age group

	1955	1967	1984
Single	9.3	21.1	36.7
Married	82.7	69.3	54.0
Divorced/Widowed	8.0	9.6	9.3
	100	100	100
Single, by age group:			
15-19	34.4	64.6	98.2
20-24	5.8	17.5	48.2
25-29	[	[	19.1
30-34	[4.3 a/	[7.0 a/	10.2
35-39	[	[	4.8
40-44	[4.1 b/	5.0 b/	3.6

a/Data refers to age group 25-34.
b/Data refers to age group 35-44.

26. In Bas-Zaire and Bandundu, regions near the capital, fertility also increased at most ages during 1955-76, but somewhat more rapidly for older women in Bandundu where changes in infertility rates were more marked (see table A.2b). In Bas-Zaire, the trend in fertility appears to have reversed during 1976-84, returning to mid-50s levels, while in Bandundu

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29/ Standardized Crude Birth Rate= (F15-49/P) * (F(i)/F15-49) * (MF'(i)/F'(i) * (B(i)/MF(i)), where:

F15-49/P = proportion of women of childbearing age in the total population, 1984;
F(i)/F15-49= age structure of women of childbearing age, 1984;
MF'(i)/F'(i)= age pattern of nuptiality, 1967; and
B(i)/MF(i)= marital fertility, 1984.

more modest declines were reported. The relatively more rapid decline in fertility in Bas-Zaire, which is also confirmed by changes in the GFR (para.28), is not surprising since the region tends to be better off socio-economically, and enjoys higher female literacy levels.[30] Similarly in Kasai-Occidental, fertility appears to have declined, in particular at younger ages during 1976-84, the only period for which parity data is available. For the sub-regions of Equateur and Tshuapa, fertility trends are significantly different from those of the other regions, with very large increases reported for 1955-76 and continuing throughout 1976-84, in particular at older ages. As discussed below these areas experienced significant drops in sterility levels. In the case of Shaba and Haut-Zaire fertility appears to have increased at all ages except the youngest over the 1955-84 period but these trends must be viewed cautiously since, as already discussed above (para. 19) the 1955 data were most likely underestimated. Finally, fertility in the Kivu region, which was very high at the outset of the 1950s, appears to have declined at the two youngest ages groups and increased at older ages.

27. The trends described above for the Western regions of Zaire (Kinshasa, Bas-Zaire, Bandundu, Kasai-Occidental and the two sub-regions of Equateur) are also consistent with trends in other indicators (see table 2.4),[31] suggesting an overall increase in fertility from 1955 to 1976 and a decline thereafter, except in Equateur where fertility was still on the rise. The significant increase in fertility during 1955-76 appears to be, in large part, related to increases in marital fertility, resulting from important reductions in childlessness; as can be seen from table 2.4 in some sub-regions of Equateur the percentage of childless women (25-34) were reported to drop from about 40 to 11 percent during the 1955-76 period, as sterility levels dropped dramatically.[32]

30/ The female literacy rate in 1984 was 47 and 56 percent respectively in Bandundu and Bas-Zaire.

31/ The proportion of the population under 15 years of age, which reflects the 'youthfulness' of the population, can provide an indirect indicator for changes in fertility.

32/ Romaniuk's analysis illustrated in fact that sterility was a powerful factor in both temporal and regional variations of fertility, with a very high negative correlation (.92) found between birth rates derived from proportions of children under five and proportions of childless women (25-34). See "Increase in Fertility During the Early Stages of Modernization", Population Studies, 1980.

Table 2.4: Comparative Demographic Indicators for Western Zaire

Region sub-region	Proportion of Population less than 15 years			Dependency Ratio a/			Percentage of Childless Women Aged 25-34 years		
	1955	1976	1984	1955	1976	1984	1955	1976	1984
Kinshasa	36.5	50.3	45.0	n.a.	106.4	88.0			
Bas-Zaire	43.7	49.1	45.3	n.a.	119.8	102.4			
Bas Fleuve							11.5	3.1	6.4
Kasai-Occidental	39.1	46.3	43.9	n.a.	101.7	92.6			
Bandundu	43.6	47.8	44.8	n.a.	103.5	96.9			
Kwilu							13.1	5.7	7.6
Mai-Ndombe							18.7	6.0	6.4
Equateur									
Equateur							38.9	9.7	9.3
Tshuapa							42.3	13.2	12.3
WESTERN ZAIRE	42.0	47.8	44.8	n.a.	106.5	94.7			

a/ Population less than 15 & greater than 60 divided by population 15-60.

n.a.-- not available

28. A decomposition of the Crude Birth Rate would provide useful insights into the factors explaining changes in fertility. However, the historical information we have for comparison with the Census data is rather patchy and limited to some areas of Western Zaire.[33] After removing the age structure effects, which tend to bias upwards the Crude Birth Rate in

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33/ As can be seen in table A.2e an attempt is made to decompose the crude birth rate into its four components: (i) proportion of women of childbearing age; (ii) age structure of women of childbearing age; (iii) age pattern of nuptiality and (iv) marital fertility, the last two constituting the General Fertility Rate.

1984,[34] we note that the magnitude of the fertility decline during 1976-84, (measured by the General Fertility Rate), is even more impressive (see Table A.2d). It appears that part of this decline in fertility can be explained by important shifts in the age pattern of nuptiality, as the proportion of single women increased and proportions married declined.[35] The 1984 standardized CBR for Western Zaire, using the 1976 nuptiality pattern, was estimated at 45.1, versus the reported rate of about 40.0. The downward trend in fertility is further substantiated by reported increases in the age at marriage, as can be seen from table 2.5.

Table 2.5: Average Age at Marriage, Females[36] (years)

Region	1955	1984
Kinshasa	18.8	22.5
Bas-Zaire	20.0	22.8
Equateur	19.1	19.9
K.Occidental	17.3	19.5
K.Oriental	17.1	19.3
Shaba	17.3	19.5
Bandundu	19.4	21.6
Haut-Zaire	18.1	19.3
Kivu	17.2	20.8
ZAIRE	18.3	20.6

34/ For regions where data is available (i.e., Bas-Zaire) we note that there has been a shift in the age structure of women of childbearing age, with a higher concentration in the younger age groups in 1984 in comparison to 1976; the proportion of women 15-29 increased from 55 to 61 percent during 1976-84.

35/ Data for regions other than Kinshasa is unfortunately not available; Nevertheless, as can be seen in table A.2f during 1976-84, for the entire Western region of Zaire, there was an estimated 9 percent increase in single women 15 years and older and a corresponding decline of 6 and 3 percent, respectively in married and divorced/widowed women; the proportion of married women in the 15-19 age group declined from 23 to 18 percent and in the 20-24 age group from 72 to 60 percent.

36/ Singulate mean age at marriage, calculated from the proportion of females single (Hajnal method).

29. While it is beyond the scope of this paper to enter into a detailed discussion of the proximate determinants of fertility, a few comments are warranted, to the extent that they shed additional light on fertility trends. Information concerning marital fertility[37] is generally scanty. First, sociological/demographic studies have generally documented declines in polygamy and the traditional post-partum abstinence period, which would tend to have a positive effect on fertility.[38] Historically, birth intervals up to 3 years were reported among some tribal groups in South-Western Zaire (i.e., Bas-Zaire, Bandundu).[39] Today, as in many other developing countries, an erosion process appears to have been set in motion, with increasing modernization, in particular education of women, changes in traditional sex roles, changes in family structure, such as increased reliance on the nuclear family and declines in polygamy, a practice which fostered post-partum abstinence.[40] While the erosion in the post-partum taboo has been fairly well documented in the literature, information on the changing pattern of lactation is not as abundant. Breast feeding appears to still be practiced almost universally but there are some indications that the duration and intensity of breast feeding is on the decline, which would reduce the fertility inhibiting effects of

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37/ Marital fertility is affected by the post-partum amenorrhea period, including abstinence practices, and the prevalence of polygamy, sterility, spontaneous abortion, induced abortion and use of contraceptive methods.

38/ For example, in a survey conducted in Kinshasa, the percentage of women aged 15-44, (married/in union), that were using abstinence, was 31 percent, showing that there is some carry over of this traditional practice but that it is no longer the primary means of achieving child spacing; see Bertrand, Bertrand and Malonga, "The Use of Traditional and Modern Methods of Fertility Control in Kinshasa, Zaire Population Studies, 37, 1983. Another survey conducted in the zone of Kintambo in the capital also showed that the traditional practice of abstinence following birth is on the decline, with close to 40 (80) percent of women with an infant 0-3 (10-12) months having resumed sexual relations; see Naissances Desirables et le Centre Libota Lilamu: Connaissances et Utilisation par la Population Feminine de la Zone de Kintambo, Departement de la Sante Publique et des Affaires Sociales, Projet des Services des Naissances Desirables, August 1986. The Contraceptive Prevalence Survey (1982-84) indicated that only 6-19 percent of women in unions were using abstinence. Finally, the EDOZA Survey found that while women in south-west Zaire have historically observed the post partum taboo this tradition is not always closely adhered to; see Sala-Diakanda, M., Pitshandenge, N., Tabutin, D., and Vilquin, E., "Fertility and child spacing in western Zaire, Zaire", Child-spacing in tropical Africa: traditions and change.

39/ Surveys carried out in the early 1960s found that the average birth interval among the Bandibu tribe (Bas-Zaire) was 35 months, versus 28 months among the Bashi (Kivu) and 27 months in Leopoldville (Kinshasa); see Romaniuk, A., La Fecondite des Populations Congolaises, Mouton, 1966.

40/ See Bertrand, Bertrand and Malonga.

breast feeding, all other things being equal.[41] Second, sterility levels, which have declined significantly during past decades, still remain quite high by world standards, and would tend to have a depressive effect on fertility. Regional estimates of primary sterility[42] and comparative indicators are presented in table 2.6 below.

Table 2.6: Estimates of primary infertility rates, by region
(Percentage of childless women aged 45-54 years)

Region	1955	1984
Kinshasa	38	6
Bas-Zaire	4-9	5
Equateur	29	20
Kasai-Occidental	13-16	12
Kasai-Oriental	26	15
Shaba	23	11
Bandundu	3-18	8
Haut-Zaire	30	28
Kivu	11	9
ZAIRE, Average	21	14
Asia & Oceania		5
Latin America		3
Africa		10
Congo		21
Central African Republic		17
Burundi		3

Source: 1955 Survey and 1984 Census; Frank, O. "Sterility in women in sub-Saharan Africa", IPPF Medical Bulletin, November 1986.

41/ The EDOZA survey (1974-76) found durations of breast feeding of 18-24 months, while the CPS (1982-84) found the majority (70-90) of urban women breast feeding for 12 months while 82-89 percent of women in rural areas breast fed for up to 18 months. Among the cattle keepers and mountain tribes of Kivu there has historically been a strong reliance on breast feeding since no post-partum taboo exists; one survey found, however, that in peri-urban areas near Bukavu, women are increasingly relying on baby food formulas, and often do not carry their babies to the fields, because of the need to cover long distances; see Carael, M., "Child-spacing, ecology and nutrition in the Kivu province of Zaire", Child-spacing in tropical Africa: traditions and change.

42/ In a society like Zaire, which is essentially pronatalist and where a large proportion of women get married and contraceptive prevalence is low,

The sterility rate in Zaire is above the regional mean and comparable to levels in the Central Africa sterility area which includes all or most of Gabon, Congo, Central African Republic, and Cameroon, as well as parts of Chad, Sudan, Tanzania, and Uganda. It has been estimated that the fertility loss or shortfall associated with the relatively high level of primary infertility in Zaire is 1.2 births per woman, which would suggest considerable potential for further increases in fertility.[43]

30. There is significant regional variation in infertility rates, with Haut-Zaire, Equateur and Kasai-Oriental having levels above the national average. During the past decades we note that the regions experiencing the largest declines in sterility (i.e., Equateur and Shaba) also had the most impressive gains in fertility.[44] Studies have shown that secondary sterility in Africa is usually proportionately greater than primary sterility, with from half as many more to threefold the number of women suffering secondary reproductive failure.[45] The limited information available on secondary sterility in Zaire appears consistent with this general finding, with the proportion of women declaring 'difficulties getting pregnant' estimated at 11 and 21 percent, respectively in the Kintambo and Bas-Zaire[46] surveys. Finally, the use of modern contraceptive methods is quite low in Zaire and remains mainly an urban phenomenon. In the CPS (1982-84) the proportion of women in 4 urban (Kinshasa, Lubumbashi, Kananga and Kisangani) and two rural areas who were using modern and traditional contraceptives was 2-11 and 9-31 percent, respectively; in the Kintambo survey 35 percent of the married women reported using traditional methods; 9 percent modern methods and 56 percent no methods. To sum up, declines in polygamy, abstinence, breast feeding, and sterility are exerting upward pressures on fertility, without an apparent offsetting increase in contraceptive prevalence. Basically, while marriage has been going down marital fertility has been going up.

B. Application of P/F Ratio Technique and Stable Population Models

31. We turn next to two techniques (P/F ratio technique and stable population models) for assessing the overall quality of the fertility data

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the percentage of childless women 45-54 years can be used as a proxy for primary sterility.

43/ Frank, O. "Sterility in women in sub-Saharan Africa, IPPF Medical Bulletin, November 1986.

44/ Haut-Zaire appears to be an exception, even though this is most likely due to data anomalies only; in fact, there are indications that sterility rates in Haut-Zaire have also dropped significantly, with a corresponding rise in fertility.

45/ Secondary sterility is defined as the absence of additional children after a reasonably long period. See Frank, O., 1986.

46/ Results of the PRODEF/TULANE Survey in Bas-Zaire, November 1982.

and providing an eventual basis for adjustment of current levels.

32. P/F ratio method This technique, developed by Brass, constitutes a powerful consistency check, whereby the age pattern of fertility derived from information on recent births is compared with the level of fertility implied by the average parity data of younger women. The method can also be used to adjust fertility on the assumptions that the age pattern of fertility, derived from births during the preceding 12 months, is correct but that the levels may be distorted by a misperception of the length of the reference period. Whereas average parities for younger women are correctly reported the current age-specific fertility pattern is then scaled to the level implied by the parities of younger women. The Brass technique involves calculation of a series of P/F ratios (mean parities (P) to cumulated fertility rates (F)[47]) which can be used as adjustment factors for the level of current fertility. The P/F ratios for younger women tend to be used as adjustment factors, on the assumption that the fertility of these women is correctly reported and has not changed very much.[48] Assuming fertility has been constant the P/F ratios would be roughly flat or slightly declining at older ages due to higher omission rates. A consistent steep decline (increase) in P/F ratios implies a recent rise (decline) in fertility.

33. Table 2.7 below shows P/F ratios for Zaire and a few selected regions; figures II.7a/7c present these in graphic form. The pattern of P/F ratios for the national average in 1984 is fairly consistent over the 20-39 age groups, with only a minor decline thereafter, which most likely reflects higher omission rates of children borne by older women. The regional patterns of P/F ratios can be classified into three categories: (i) the first group (Shaba, Kivu, Kasais) is characterized by fairly constant P/F ratios for the 20-39 age groups and declines at older ages (figure II.7c); (ii) the second (Haut-Zaire and Equateur, figure II.7a) contains a series of P/F ratios which decline gradually with age; and (iii) the last group (Kinshasa, Bandundu and Bas-Zaire, Figure II.7b) contains a series of erratic P/F ratios, implying heavy distortions. In the case of Haut-Zaire and Equateur the behavior of the P/F series would suggest that fertility most likely increased, but even in these regions the decline of the P/F ratios is not very steep.

34. The adjusted total fertility rates based on the P/F technique[49] range from 5.7 in Haut-Zaire to 8.3 in Shaba, with the national average estimated at 7.3 (compared to a reported TFR of 6.0) in 1984. The three largest adjustments in the TFR were made in Kinshasa (5.0 to 7.2), Bandundu

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47/ The cumulated age-specific fertility rates are calculated and then interpolation is used to obtain average parity equivalents for standard five-year age groups.

48/ For details of methodology, see Manual X, Indirect Techniques for Demographic Estimation, United Nations, N.Y., 1983.

49/ The adjustment factor used is the average of P(2)/F(2), P(3)/F(3) and P(4)/F(4).

(5.8 to 7.3) and Kasai-Occidental (6.0 to 7.4). The adjustments based on the P/F method lead to significantly higher fertility rates in comparison to reported ones.[50]

Table 2.7: P/F Ratios

Age Group of Women	Zaire 1955	Zaire 1984	Haut-Zaire	Kinshasa	Shaba
15-19	1.13	1.50	1.73	1.66	1.43
20-24	.99	1.26	1.27	1.43	1.24
25-29	.88	1.24	1.20	1.46	1.23
30-34	.88	1.18	1.12	1.45	1.19
35-39	.91	1.17	1.08	1.52	1.19
40-44	.83	1.12	1.01	1.49	1.12
45-49	.81	1.03	.89	1.44	1.04

35. Stable population models were also used to assess the level of fertility. The first method used, which was applied to each sex separately, involves the selection of a stable population model based on the proportion under age 5, and the implied Coale-Demeny mortality level derived from the child mortality estimates and identification of the birth rate through interpolation. This method was used to facilitate comparison with the adjusted figures from the 1955 Survey, which were derived using the same technique. Its principal limitation is that omission of young children would tend to bias downwards the estimated parameters; it should also be recognized that estimated parameters based on stable population analysis might be biased to the extent that the migration assumption is violated; see Annex I for details. Recognizing these limitations these procedures are still worth trying. The adjusted crude birth rates, by region, based on this method are presented below, along with the adjusted figures from the P/F technique discussed above. The adjusted crude birth rate (CBR) based on the female data is lower in all cases (except Kivu) than the CBR based on the male data. The average CBR (42-44) tends to be much closer to the reported CBR (42) than that derived from the P/F method (53). The second stable population technique used for estimating the Crude Birth Rate, along with the Gross Reproduction Rate (GRR)[51] and the Total Fertility Rate (TFR), involves the selection of a stable population model on the basis of the proportion of the population under 15, C(15), and the probability of surviving to age 5 l(5), for both sexes combined. The method is based on the assumption that if one sex-specific life table is

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50/ Application of the P/F technique in other demographic surveys carried out by the Institut National de la Statistique (Bukavu, 1970 and Kananga, 1974) also led to very high adjusted fertility rates; see Etude Socio-Demographique de Kananga, 1974.

51/ The GRR refers to the number of daughters expected to be born alive to a hypothetical cohort of 1,000 women if no women died during the childbearing years and if the same schedule of age-specific rates applied throughout the childbearing years.

used, (for example, females in this case), the mortality pattern embodied in those life tables is an adequate representation of the mortality pattern prevalent in the whole population. This assumption is more satisfactory than it would appear at first glance since only the mortality up to age 15 is of major importance, and differences between the mortality pattern for both sexes combined and those of each one separately are relatively small. The advantages of this method are: (a) proportion under 15 for both sexes combined is often less affected by age misreporting; (b) use of 1(5) estimated from the proportion of children surviving among those borne by women aged 30 to 40, is a fairly reliable estimate of mortality; and (c) selection of a model stable population on the basis of C(15) and 1(5) provides an estimate of the birth rate that closely matches the average birth rate during the 15 years preceding enumeration, even when the population in question is far from stable.[52] The results of this procedure are presented below:

Table 2.8: Estimated Parameters Determined by the Reported Proportion Under age 15, C(15)= .447, and the Probability of Surviving to Exact Age 5, 1(5)=.8004

Sex	Coale Demeny Family, Level	Growth Rate	Birth Rate	GRR	TF
Females	North 12.19	3.20	45.60	3.09	6.27
Males	North 13.13	2.80	45.40		
Females	West 12.18	3.16	45.43	3.09	6.26

These results appear to provide further evidence that the average Crude Birth Rate in Zaire is close to the mid 40s, in comparison to the reported rate of 42 per 1000.[53]

36. The external consistency of the estimates derived from the methods discussed above was evaluated, by reviewing the implied trends for the

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52/ For further details, see Manual X, Indirect Techniques for Demographic Estimation, United Nations, N.Y., 1983.

53/ It should be noted, however, that the results have to be viewed somewhat cautiously since one would not expect a differential in the male/female growth rates.

1955-84 period.[54] The table below summarizes the implied percentage changes in the crude birth rate based on reported and adjusted figures. In the case of Equateur, Haut-Zaire, and part of Kasai-Oriental the picture which emerges is one of rising fertility, irrespective of the method used to adjust the 1984 figures, even though the magnitude of the increases varies substantially. For the remaining regions the two methods yield divergent results both in terms of the magnitude and direction of the fertility trends, and it is more difficult to draw tidy conclusions. While the estimates based on stable population models imply a slight decline in the CBR (3-10 percent) for these regions the P/F method signals an increase (6-17 percent).

Table 2.9: Trends in the Crude Birth Rate, Reported and Adjusted, 1955-84

	Reported			Adjusted			Reported	Adjusted	
	1955	1978	1984	1955	1984		Percentage Change 1955-84		
					P/F	Stable Popul. (Males)		P/F	Stable Popul.
Region									
Kinshasa	52.2	54.9	36.7	53.5	53.9	37.7	-30	0	-30
Bas-Zaire	45.0-48.0	44.4 a/	40.3	47.8-50.2	50.9	42.7	-10/16	+1-+6	-11--15
Equateur	38.4	n.a	49.7	38.8	49.2	42.7	+6	+27	+10
Kasai-Occiden.	43.1-45.8	40.5 a/	42.0	48.5-49.1	54.2	43.0	-3/7	+10-+12	-11--12
Kasai-Oriental	41.6-48.2	n.a.	44.0	41.7-48.3	54.1	46.7	+6/-9	+12-+30	-3-+12
Shaba	50.2	n.a.	46.5	51.9	50.4	46.9	-7	+13	-10
Bandundu	44.3-48.1	44.0 a/	40.3	45.9-53.8	53.5	43.1	-9/16	+17	-6--20
Haut-Zaire	30.8	n.a.	36.8	32.2	44.5	39.2	+19	+38	+22
Kivu	47.2	n.a	47.3	53.4	56.4	48.3	0	+6	-10
ZAIRE	42.7	n.a.	42.0	45.2	52.9	43.7	-2	+17	-3
For Reference:									
GRR				2.9		3.1			
TFR				5.9	7.3	6.3			

n.a.-- not available

a/ Excludes major urban areas.

54/ The figures for 1955 were taken from an in-depth analysis carried out by Romaniuk. His adjusted figures for 1955 were derived through the

37. Summary It is not clear that the P/F method provides the best basis for an adjustment since the patterns of the P/F series do not exhibit consistent trends and the key assumption of constant fertility in the recent past for younger women does not hold true for most regions. The implied changes in fertility based on stable population models appear more reasonable and generally consistent with information on trends in other indicators (average parities, general fertility rates, proportion of population less than 15 years of age) discussed in previous sections. In summary, the regions of Zaire can be classified into three broad categories according to the level of fertility at the outset of the 50s and the direction of change during the past three decades: the first group includes Kinshasa, Bas-Zaire and Kivu, which are characterized by declining/constant fertility, in part related to the changing pattern of nuptiality, particularly during the late 1960s/70s. The second consists of Kasai-Occidental and Kasai-Oriental, regions which also had high fertility levels in the 50s, but where fertility continued increasing, as sterility declined; Shaba and Bandundu, which appear to have experienced a moderate rise in fertility, are also included in this category, even though these trends remain to be confirmed through further research. The third group consists of Equateur, and Haut-Zaire, where fertility levels were relatively low but have increased dramatically during the last three decades as childlessness dropped. Nationwide, fertility appears to have increased in Zaire, with the Total Fertility Rate rising from 5.9 to 6.3. The crude birth rate is currently estimated at 44-45 per thousand.

38. The Total Fertility Rate of about 6.3 is comparable to levels in neighboring countries of Central Africa (i.e., Congo, 6.0, Angola, 6.5, Cameroon, 6.5) but lower than those prevailing in Eastern Africa (i.e., Uganda, 7.0, Malawi, 7.8, Rwanda, 8.3 and Kenya, 8.0[55]). The pace of change in fertility in different regions of Zaire is also similar to that in neighboring countries; for example, the virtual stagnation of fertility in the Kivu is similar to trends in Rwanda and Burundi while the increases seen in the northern and central regions of Zaire were also recorded in other countries where sterility levels were historically high and have subsequently dropped (Congo, Cameroon and Central African Republic).

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application of the stable population technique discussed above. See La Fecondite des Populations Congolaises.

55/ World Development Report 1984, The World Bank.

Table 2.10: Trends in Fertility Levels

Level of Fertility 1950s	Region	1950s/80s
HIGH		
Group I	Kinshasa * Bas-Zaire Kivu *	Decline/Constant
Group II	Kasai Occidental Kasai Oriental	Increase
	Bandundu Shaba *	Moderate Increase
LOW		
Group III	Equateur Haut-Zaire	Increase

(*) Highest estimated fertility rates at outset of 50s.

ANNEX I

QUALITY OF AGE DISTRIBUTION DATA

39. Before proceeding to an analysis of the data from the 10 percent sample a number of tests were performed to verify the overall quality of the age distribution data. Of particular concern is the quality of the female age distribution since this data is used in the estimates of fertility and mortality produced in this paper. Errors in tabulated data on age may arise from three types of enumeration errors: (a) coverage errors (individuals of a given age are missed by the census or included twice), (b) failure to record age, and (c) misreporting of age.

40. The first test used to verify the quality of the age distribution data is the age-sex accuracy index developed by the United Nations. This index is used to assess the accuracy of the age and sex ratios from age to age, in comparison to expected patterns.[56] The data is classified as accurate, inaccurate, or highly inaccurate, depending on whether the combined index is below 20, 20-40 or above 40. The major drawbacks of this aggregate index is that it does not take account of the expected decline in the sex ratio with increasing age and it does not enable us to determine the separate contribution of each of the types of errors mentioned above.

41. The aggregate index (21) for Zaire suggests that there appears to be some age misreporting but that the problem is not as severe as in most Sub-Saharan African populations. Most of the regions fall within the lower range (25-32) of the 'inaccurate' category (table A.1); two notable exceptions are Shaba (18), which appears to have better than average age reporting and Kinshasa (42) which is classified as 'highly inaccurate'. Given the relatively heavier weight accorded to the sex ratio component of the aggregate index it is not surprising that Kinshasa, with its heavily male-dominated population (sex ratio of 108 for 15-64 and 146 for 50+) is classified as highly inaccurate; this is largely due to the nature of the index which fails to capture real irregularities.

56/ The mean of the differences from age to age in reported sex ratios, without regard to sign, is taken as a measure of the accuracy of the observed sex ratios, on the assumption that these age-to-age changes should approximate zero. A combined index incorporates the sum of the mean deviation of the age ratios for males and females from 100 and three times the mean of the age-to-age differences in reported sex ratios; see

42. The aggregate index, however, tends to mask data flaws for specific age groups. These distortions are revealed through a closer analysis of the age ratios component of the aggregate age-sex accuracy index.[57] The results for both sexes are presented in graphic form in figure I.1a-1i. The female data for specific age groups appears to be generally of dubious quality, as can be seen from the series of wild fluctuations in the age ratios. The key exception is the quality of the data for the younger age groups (less than 30) in about half the regions (i.e., Bas-Zaire, Bandundu and the two Kasais), which appear reasonably good, as can be seen from the relatively small deviations from 100. For the national average (figure I.1i), the data become more irregular during the late reproductive age groups, as the deviations from 100 increase. The age ratios for males are also characterized by similar oscillations from one age group to the next and no discernible pattern. On average, the quality of the female age distribution data is slightly better than that of the males.

Table A.1: Analysis of Age Structure, Summary Indicators

Region	Overall Sex Ratio	Age-Sex Accuracy Index
Kinshasa	104.2	42.1
Bas-Zaire	95.3	30.4
Equateur	95.1	26.3
Kasai-Occid.	96.1	30.7
Kasai-Orient.	96.9	24.6
Shaba	99.0	18.3
Bandundu	91.8	32.0
Haut-Zaire	94.4	31.5
Kivu	95.0	24.8
Average	96.1	20.9

Source: United Nations, Methods of Appraisal of Quality of Basic Data for Population Estimates, Manual II, Population Studies, Series A, No. 23, pp. 42-43; idem, "Accuracy Tests for Census Age Distributions Tabulated in Five-Year and Ten-Year Groups" Population Bulletin, No.2, October 1952, pp. 59-79.

Wunsch, Guillaume, Methodes d'analyse demographique pour les pays en developpement, Departement de Demographie, Universite Catholique de Louvain.

57/ The age ratio is defined as: (5Pa)/(.5 * (5Pa-5 + 5Pa+5)) * 100.

43. The level and pattern of the sex ratios provide further evidence concerning flaws in the age distribution data.[58] The sex ratio at birth (males per 100 females) in Zaire is 100 (national average), with most regions reporting similar or even lower ratios. Most of these sex ratios are lower than the conventional value (103) for Sub-Saharan African populations, which suggests that there is probably differential omission of boys among births and/or misreporting of the sex of the reported children.[59] Kinshasa is the only exception with a dubious sex ratio at birth of 109.

44. The age pattern of the sex ratio is characterized by near equality in early childhood (under 20) and large deficits of males at all ages beyond (figures I.2b/2k). The average sex ratio for Zaire (figure I.2b) begins dipping below 100 at age 20, and continues through 40. After age 45 the sex ratios increase gradually but remain well below 100. These large deficits (20-40) raise the following possible explanations:

(i) selective male emigration;
(ii) significant underenumeration of males; and
(iii) age misreporting (i.e., transfer to younger/older age groups).

The first two explanations appear quite plausible since it is generally recognized that young males tend to be mobile and more likely to migrate towards economically developed areas where educational and job opportunities are more abundant. However, external migration does not appear to be an important phenomenon in Zaire, and internal migration can only explain part of the deficits since with the exception of Kinshasa all regions are characterized by male deficits of varying sizes. For example, Shaba and Bandundu, areas of in and out migration, respectively, have the lowest and highest deficits, respectively. This would therefore suggest, that there is probably also age misreporting. Kinshasa, on the other hand, with its predominantly male population has a unique pattern of sex ratios, characterized by surpluses at all ages above 30.[60]

58/ In the absence of migration, the patterns of expected sex ratios are quite similar across countries, with the possible exception of the sex ratio at birth. Sex ratios fall gradually throughout life, not dipping below 100 until age 40 or later, with a steeper decline at older ages. This pattern results from the usual small excess of boys among births and the usual excess of male over female mortality.

59/ The EDOZA Surveys also found that sex ratios at birth in Western Zaire tended to fall below 100, suggesting that the reporting of male births was incomplete or that small boys tended to be aged into the 5-9 age group; see Synthese des Etudes Demographiques de l'Ouest du Zaire, 1974-77, Departement de Demographie, Universite Catholique de Louvain, Louvain-la-Neuve, 1978.

60/ This pattern of sex ratios, characterized by large surpluses in the adult age groups, is fairly common for urban areas; a demographic survey

45. In addition to the aggregate index discussed above, stable population models were also used as a yardstick against which to compare the reported age distribution for Zaire. Stable population models are a useful analytic tool for assessing distortions in the reported age distributions.[61] A stable population is selected based on two parameters of the observed population, which are least likely to be biased by data flaws. Inspite of the possible violations of the underlying assumptions (constant mortality and fertility; no migration) these procedures are still well worth trying since they enable us to gain a visual impression of how closely the reported age distribution resembles a stable age distribution, and how much it is distorted by misreporting, selective omission or genuine differences.

46. Two procedures were carried out using stable population models. The first involves selecting a stable population, by matching the observed C(5), the proportion under age 5, and the implied Coale-Demeny mortality level, (North family) derived from the child mortality estimates discussed above. The results are presented in tables A.11-1u and can be seen in figures I.3a-3e. For the male age distribution similar patterns emerge across regions: surpluses at younger ages (less than 25), and deficits between 30 and 50. In some regions (i.e., Bas-Zaire, Equateur, two Kasais) there are also surpluses at the oldest ages, possibly because responses are affected by the social prestige accorded to the elderly or by the tendency of interviewers to 'age' men who do not have exact knowledge of their age into the oldest age groups. The pattern between the observed and stable age distribution for the females is very similar across regions to that of the males, namely surpluses at the youngest and oldest ages and deficits in between, but the magnitude of the deviations from the stable population models are much smaller than those for the males.

47. The second procedure carried out involved the calculation of a series of birth rates [b(x)], by finding the model stable populations which have the same proportions under each age as the observed population.[62] Deviations in b(x) from the expected horizontal line (the sequence of b(x) for a truly stable population would be nearly constant) may be due to either age-misreporting or lack of stability or true discrepancies between the population's mortality pattern and that embodied by the model stable populations being used.[63]

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carried out in Kananga (1974) found a similar pattern of sex ratios, with large surpluses above 40.

61/ A 'stable population' is one which is subject, for a sufficiently long time, to constant fertility and mortality, with the end result being a fixed age distribution. Empirical work has shown that even where mortality has been declining in recent times, as is the case in many developing countries, the age distribution still resembles that of the stable population.

62/ The model stable population was found through interpolation at an arbitrarily chosen level of mortality (i.e., North family, level 13); this is because of the unique feature of stable populations which yield broadly similar results when matching proportions under successive age groups, irrespective of the mortality levels chosen.

The b(x) values derived from the age distributions for males and females are shown separately in figures I.4a/4b and I.4c/4d. With the exception of Kinshasa, where the migration assumption is clearly violated, the b(x) sequence for males show similarities of pattern across regions. For the males, the values of b(x) have a ascending segment through about age 30 and a descending segment thereafter.[64] In some regions there is another ascending segment at older ages (i.e., Kasai-Occidental, Haut-Zaire, Bandundu). The rising (descending) segments imply that there is a higher (lower) proportion of the reported population in these age intervals than in the stable population it has been matched to. For the females, (again with the exception of Kinshasa) the sequence of b(x) for most regions, although far from perfectly horizontal, tend to vary within narrower ranges, at least through age 45. After 45 we note ascending segments in most regions, suggesting an upward transfer across this age because of the 'aging' effect discussed above.

48. The two methods above, based on stable population models, yield broadly similar results to the analysis of age and sex ratios and suggest that a combination of factors are at work: (i) heavy underenumeration between 30 and 50 for males, (ii) selective male emigration and (iii) age misreporting. Other demographic surveys carried out in Zaire have also suggested that age misreporting for individuals over age 25, resulting from poor knowledge of age among Zairian adults is a particularly acute problem.[65] The fairly systematic pattern of deviations for both sexes, with respect to age, and the relatively more youthful observed age structures may also suggest that one of the key assumptions of a stable population --constant fertility-- is violated. In practice it is, however, difficult to disentangle enumeration errors from actual deviations from stability.

49. In summary, irrespective of the method used, the quality of the age distribution data looks generally more reasonable at younger ages and heavily flawed thereafter, with the female data being slightly better on balance than that of the males.

63/ For further details of the methodology, see Manual X, Indirect Techniques for Demographic Estimation, United Nations, N.Y., 1983.

64/ This pattern is characteristic of Equateur, the Kasais, and Bandundu; in the case of Bas-Zaire the descending segment starts earlier, and for Shaba and Kivu somewhat later.

65/ Synthese des Etudes Demographiques de l'Ouest du Zaire, 1974-77, Departement de Demographie, Universite Catholique de Louvain, Louvain-la-Neuve, 1978; Etude Socio-Demographique de Kananga, Institut National de la Statistique, 1978.

BIBLIOGRAPHY

Bertrand, et al, Results of the PRODEF/TULANE Survey in Zaire, November 1982.

Bertrand, Jane T., Bertrand, W.E. and Malonga, Miatudila, "The Use of Traditional and Modern Methods of Fertility Control in Kinshasa, Zaire", Population Studies, 37, 1983.

Boute, Joseph and de Saint Moulin, Leon, Perspectives Demographiques Regionales, 1975-85, Republique du Zaire, Departement du Plan.

Brown, Judith E., and Brown, Richard C., "Characteristics of Contraceptive Acceptors in Rural Zaire", Studies in Family Planning, Vol 11, 1980.

Carael, M., "Child-spacing, ecology and nutrition in the Kivu province of Zaire", Child-spacing in tropical Africa: traditions and change, Page, hilary J. and Lesthaeghe, R., editors, Academic Press, 1981.

Demeny, Paul, "The Demography of the Sudan: An Analysis of the 1955/56 Census, The Demography of Tropical Africa, Brass, et., al., Princeton University Press, 1968.

Etude Socio-Demographique de Kananga, Institut National de la Statistique, 1978.

Etude Socio-Demographique de Kinshasa, 1967, Institut National de la Statistique, 1969.

Farley, T.M.M. and Belsey, E.M., "The Prevalence and Aetiology of Infertility", Special Programme of Research, Development and Research Training in Human Reproduction, WHO, cited in proceedings from IUSSP African Population Conference, Dakar, 1988.

Frank, Odile, "Sterility in women in sub-Saharan Africa", IPPF Medical Bulletin, November 1986.

Hill, Althea, The Demography of Zambia, Population, Health and Nutrition Department, World Bank, July 1985.

Hill, Althea and Hill, Kenneth, "La mortalite en Afrique: Niveaux, tendances, differences et perspectives", L'etat de la Demographie Africaine, Union Internationale pour l'Etude Scientifique de la Population, 1988.

Initial Investigations of the Demographic Impact of AIDS In One African Country, Draft, 15 June 1987.

Makami, Bakutuvwidi, et al, Planification Familiale, Fecondite et Sante, 1982-84, INS, Westinghouse Public Applied Systems, 1985.

Manual X, Indirect Techniques for Demographic Estimation, United Nations, N.Y., 1983.

Morbidite et Mortalite Infantiles et Juveniles a Kinshasa, Avril 1988, Departement de la Sante et des Affaires Sociales, Fond National Medico-Sanitaire, UNICEF.

Morbidite et Mortalite Infantiles et Juveniles dans les Grandes Villes du Zaire, Avril 1988.

Naissances Desirables et le Centre Libota Lilamu: Connaissances et Utilisation par la Population Feminine de la Zone de Kintambo, Departement de la Sante Publique et des Affaires Sociales, Projet des Services des Naissances Desirables, August 1986.

Page, Hilary, "La fecondite et la planification familiale en Afrique", L'etat de la Demographie Africaine, Union Internationale pour l'Etude Scientifique de la Population, 1988.

Pitshandenge, Population Dynamics in Zaire, Population and Development, June 1986.

Population, Health and Nutrition Review, World Bank, June 23, 1988

Rapport de mission sur l'evaluation des besoins d'aide en matiere de population, UNFPA, April 1985

Romaniuk, Anatole, "The Demography of the Democratic Republic of the Congo", The Demography of Tropical Africa, W. Brass, et. al., Princeton University Press, Princeton, New Jersey, 1968.

Romaniuk, A., "Increase in natural fertility during the early stages of modernization: evidence from an African case study, Zaire", Population Studies 34, no. 2, p. 293-310

Romaniuk, A., La Fecondite des Populations Congolaises, Mouton, 1966

Sala-Diakanda, Mpenbele and Louis Lohle-Tart, Social Science Research for Population Policy Design: Case Study of Zaire, IUSSP, 1982.

Sala-Diakanda, M., Pitshandenge, N., Tabutin, D., and Vilquin, E., "Fertility and child spacing in western Zaire, Zaire", Child-spacing in tropical Africa: traditions and change, Page, hilary J. and Lesthaeghe, R., editors, Academic Press, 1981.

Synthese des Etudes Demographiques de l'Ouest du Zaire, 1974-77, Departement de Demographie, Universite Catholique de Louvain, Louvain-la-Neuve, 1978.

World Development Report 1984, The World Bank, Oxford University Press

Wunsch, Guillaume, Methodes d'analyse demographique pour les pays en developpement, Departement de Demographie, Universite Catholique de Louvain.

STATISTICAL APPENDIX

Statistical Appendix

Tables

A.1a: Analysis of Age Structure, Summary Indicators

Region	Sex Ratio	Age-Sex Accuracy Index a/
Kinshasa	104.2	42.1
Bas-Zaire	95.3	30.4
Equateur	95.1	26.3
Kasai-Occid.	96.1	30.7
Kasai-Orient.	96.9	24.6
Shaba	99.0	18.3
Bandundu	91.8	32.0
Haut-Zaire	94.4	31.5
Kivu	95.0	24.8
TOTAL	96.1	20.9

a/ This age-sex accuracy index, proposed by the United Nations, describes data in the following fashion:

under 20 -- accurate
20-40 -- inaccurate
over 40 -- highly inaccurate

Source: United Nations, Methods of Appraisal of Quality of Basic Data for Population Estimates, Manual II, Population Studies, Series A, A, No. 23, pp. 42-43; idem, "Accuracy Tests for Census Age Distributions Tabulated in Five-Year and Ten-Year Groups" Population Bulletin, No.2, October 1952, pp. 59-79.

A.1b: Age Distribution of the Resident Population, by sex

Region ZAIRE

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculin	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.024	0.012	0.012	100.4								
1	0.039	0.020	0.019	101.0								
0-4	0.170	0.085	0.085	100.0	---	---		---				
5-9	0.148	0.074	0.074	99.7	-0.4	0.4	98.7	-1.3	1.3	99.2	-0.8	0.8
10-14	0.126	0.065	0.065	100.2	0.5	0.5	101.5	1.5	1.5	101.2	1.2	1.2
15-19	0.107	0.054	0.054	100.3	0.1	0.1	96.3	-3.7	3.7	94.0	-6.0	6.0
20-24	0.098	0.047	0.049	95.1	-5.2	5.2	104.2	4.2	4.2	107.5	7.5	7.5
25-29	0.074	0.036	0.038	95.0	-0.1	0.1	100.1	0.1	0.1	97.9	-2.1	2.1
30-34	0.054	0.026	0.029	89.2	-5.7	5.7	87.9	-12.1	12.1	90.6	-9.4	9.4
35-39	0.047	0.022	0.025	87.3	-1.9	1.9	106.0	6.0	6.0	105.1	5.1	5.1
40-44	0.035	0.016	0.019	82.5	-4.8	4.8	80.8	-19.2	19.2	83.8	-16.2	16.2
45-49	0.037	0.017	0.020	83.3	0.8	0.8	112.1	12.1	12.1	113.0	13.0	13.0
50-54	0.032	0.015	0.017	85.7	2.4	2.4	103.2	3.2	3.2	103.1	3.1	3.1
55-59	0.024	0.011	0.013	89.2	3.6	3.6	92.2	-7.8	7.8	90.1	-9.9	9.9
60-64	0.021	0.010	0.011	89.4	0.2	0.2	79.8	-20.2	20.2	91.9	-8.1	8.1
65+	0.025	0.014	0.011									
NS	0.001	0.000	0.000									
Total	100	49.0	51.0	96.1		25.6			91.3			82.4
					Average:	2.1		Average:	7.6		Average:	6.9
					Combined Index:	20.9						

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.447	0.224	0.224	99.9
15-49	0.451	0.217	0.234	92.7
50+	0.101	0.049	0.052	94.5
15-64	0.527	0.252	0.275	91.9

A.1c: Age Distribution of the Resident Population, by sex

Region KINSHASA

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.023	0.012	0.011	109.4								
1	0.037	0.019	0.019	99.1								
0-4	0.163	0.082	0.081	101.5	---	---	---	---	---			
5-9	0.152	0.076	0.076	99.3	-2.2	2.2	101.9	1.9	1.9	101.1	1.1	1.1
10-14	0.135	0.066	0.069	95.1	-4.2	4.2	101.1	1.1	1.1	101.3	1.3	1.3
15-19	0.116	0.055	0.061	90.2	-4.9	4.9	91.4	-8.6	8.6	96.7	-3.3	3.3
20-24	0.111	0.054	0.057	95.8	5.6	5.6	107.8	7.8	7.8	107.9	7.9	7.9
25-29	0.090	0.046	0.044	103.7	7.9	7.9	102.3	2.3	2.3	101.3	1.3	1.3
30-34	0.066	0.035	0.030	115.4	11.7	11.7	93.2	-6.8	6.8	89.8	-10.2	40.2
35-39	0.053	0.030	0.024	125.3	10.0	10.0	111.6	11.6	11.6	107.8	7.8	7.8
40-44	0.031	0.018	0.013	134.0	8.6	8.6	76.6	-23.4	23.4	73.9	-26.1	26.1
45-49	0.030	0.017	0.013	137.1	3.1	3.1	113.1	13.1	13.1	117.1	17.1	17.1
50-54	0.021	0.013	0.008	155.2	18.1	18.1	99.3	-0.7	0.7	90.5	-9.5	9.5
55-59	0.013	0.008	0.005	151.5	-3.7	3.7	93.7	-6.3	6.3	93.9	-6.1	6.1
60-64	0.008	0.005	0.003	142.8	-8.7	8.7	69.4	-30.6	30.6	67.4	-32.6	32.6
65+	0.009	0.005	0.004									
NS	0.002	0.001	0.001									
Total	100	51.0	49.0	104.2		88.8			114.3			124.4
					Average	7.4		Average	9.5		Average	10.4

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
				Combined Index 42.1
0-14	0.450	0.224	0.226	98.8
15-49	0.497	0.255	0.242	105.4
50+	0.051	0.030	0.021	145.8
15-64	0.538	0.280	0.258	108.4

A.1d: Age Distribution of the Resident Population, by sex

Region BAS-ZAIRE

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.023	0.012	0.011	102.8								
1	0.038	0.019	0.019	101.0								
0-4	0.167	0.084	0.083	101.5	---	---	---	---	---			
5-9	0.149	0.075	0.074	100.6	-0.9	0.9	97.7	-2.3		2.3	99.2	-0.8	0.8
10-14	0.137	0.069	0.067	102.9	2.3	2.3	103.9	3.9		3.9	102.4	2.4	2.4
15-19	0.116	0.059	0.057	102.6	-0.3	0.3	105.5	5.5		5.5	100.9	0.9	0.9
20-24	0.088	0.042	0.046	91.3	-11.3	11.3	92.2	-7.8		7.8	96.9	-3.1	3.1
25-29	0.070	0.032	0.038	86.0	-5.4	5.4	97.4	-2.6		2.6	103.5	3.5	3.5
30-34	0.051	0.025	0.027	91.3	5.4	5.4	94.6	-5.4		5.4	87.8	-12.2	12.2
35-39	0.043	0.019	0.023	82.8	-8.5	8.5	102.0	2.0		2.0	104.5	4.5	4.5
40-44	0.032	0.014	0.018	75.2	-7.7	7.7	75.4	-24.6		24.6	82.8	-17.2	17.2
45-49	0.037	0.017	0.020	82.1	6.9	6.9	119.2	19.2		19.2	114.1	14.1	14.1
50-54	0.032	0.014	0.017	82.2	0.1	0.1	102.2	2.2		2.2	101.8	1.8	1.8
55-59	0.025	0.011	0.014	81.7	-0.5	0.5	91.6	-8.4		8.4	95.7	-4.3	4.3
60-64	0.022	0.010	0.012	90.0	8.2	8.2	75.5	-24.5		24.5	80.7	-19.3	19.3
65+	0.091	0.016	0.015										
NS	0.000	0.000	0.000										
Total	100	48.8	51.2	95.3		57.4				103.2			84.2
					Average:	4.8		Average:		9.0		Average:	7.0
Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Combined Index:	80.4							
0-14	0.453	0.228	0.224	101.6									
15-49	0.437	0.207	0.230	90.3									
50+	0.110	0.052	0.058	90.7									
15-64	0.516	0.243	0.272	89.3									

A.1c: Age Distribution of the Resident Population, by sex

Region EQUATEUR

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.023	0.012	0.011	102.8								
1	0.038	0.019	0.019	100.5								
0-4	0.165	0.083	0.083	100.1	---	---	---	---	---			
5-9	0.142	0.071	0.071	100.6	0.5	0.5	97.9	-2.1	2.1	97.8	-2.2	2.2
10-14	0.124	0.063	0.062	101.2	0.5	0.5	99.7	-0.3	0.3	100.0	0.0	0.0
15-19	0.107	0.054	0.053	102.7	1.5	1.5	99.1	-0.9	0.9	95.7	-4.3	4.3
20-24	0.096	0.047	0.049	96.6	-6.0	6.0	106.4	6.4	6.4	109.4	9.4	9.4
25-29	0.071	0.034	0.036	94.6	-2.0	2.0	97.3	-2.7	2.7	95.8	-4.2	4.2
30-34	0.051	0.024	0.027	87.1	-7.5	7.5	86.4	-13.6	13.6	89.3	-10.7	10.7
35-39	0.044	0.020	0.024	83.3	-3.8	3.8	103.0	3.0	3.0	106.8	6.8	6.8
40-44	0.034	0.016	0.018	85.5	2.2	2.2	82.2	-17.8	17.8	78.7	-21.3	21.3
45-49	0.040	0.018	0.022	80.3	-5.2	5.2	110.1	10.1	10.1	116.9	16.9	16.9
50-54	0.036	0.017	0.020	85.1	4.8	4.8	108.8	8.8	8.8	103.6	3.6	3.6
55-59	0.029	0.013	0.016	82.0	-3.0	3.0	92.8	-7.2	7.2	93.9	-6.1	6.1
60-64	0.025	0.011	0.014	80.2	-1.9	1.9	76.6	-23.4	23.4	83.9	-16.1	16.1
65+	0.034	0.016	0.018									
NS	0.000	0.000	0.000									
Total	100	48.7	51.3	95.1		39.1			96.4			101.7
					Average:	3.3		Average:	8.0		Average:	8.5

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.432	0.216	0.215	100.6
15-49	0.443	0.213	0.230	92.7
50+	0.125	0.057	0.067	85.4
15-64	0.534	0.254	0.280	90.9

Combined Index: 28.3

A.1f: Age Distribution of the Resident Population, by sex

Region KASAI-OCCIDENTAL

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.023	0.012	0.012	98.5								
1	0.039	0.020	0.019	101.5								
0-4	0.166	0.082	0.083	98.5	---	---	---	---	---			
5-9	0.143	0.071	0.072	99.2	0.7	0.7	98.5	-3.5	3.5	97.5	-2.5	2.5
10-14	0.130	0.066	0.064	102.6	3.4	3.4	102.3	2.3	2.3	101.0	1.0	1.0
15-19	0.112	0.057	0.055	104.0	1.4	1.4	101.4	1.4	1.4	98.8	-1.2	1.2
20-24	0.094	0.047	0.047	99.7	-4.2	4.2	100.7	0.7	0.7	101.1	1.1	1.1
25-29	0.074	0.038	0.036	94.7	-5.0	5.0	103.1	3.1	3.1	101.3	1.3	1.3
30-34	0.051	0.023	0.028	81.8	-12.9	12.9	80.5	-19.5	19.5	88.1	-11.9	11.9
35-39	0.047	0.021	0.026	81.8	0.0	-0.0	111.1	11.1	11.1	107.8	7.8	7.8
40-44	0.035	0.015	0.020	76.1	-5.7	5.7	75.6	-24.4	24.4	81.2	-18.8	18.8
45-49	0.042	0.019	0.023	81.7	5.6	5.6	120.1	20.1	20.1	118.8	18.8	18.8
50-54	0.036	0.016	0.019	85.4	3.7	3.7	101.0	1.0	1.0	103.4	3.4	3.4
55-59	0.027	0.013	0.014	97.0	11.6	11.6	100.7	0.7	0.7	90.7	-9.3	9.3
60-64	0.022	0.010	0.011	90.7	-6.3	6.3	81.8	-18.2	18.2	104.3	4.3	4.3
65+	0.020	0.012	0.008									
NS	0.001	0.000	0.001									
Total	100	49.0	51.0	96.1		60.5			106.0			81.2
					Average:	5.0		Average:	8.8		Average:	6.8

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.439	0.219	0.219	99.9
15-49	0.456	0.218	0.237	92.0
50+	0.105	0.052	0.053	99.1
15-64	0.541	0.259	0.282	91.8

Combined Index: 30.7

A.1g: Age Distribution of the Resident Population, by sex

Region KASAI-ORIENTAL

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.027	0.013	0.013	100.7								
1	0.041	0.021	0.020	104.9								
0-4	0.179	0.090	0.088	102.1	---	---	---	---	---			
5-9	0.150	0.075	0.074	100.7	-1.4	1.4	94.9	-5.1	5.1	96.7	-3.3	3.3
10-14	0.133	0.068	0.066	103.5	2.8	2.8	101.4	1.4	1.4	100.3	0.3	0.3
15-19	0.115	0.059	0.056	104.5	1.0	1.0	102.3	2.3	2.3	99.6	-0.4	0.4
20-24	0.094	0.047	0.047	99.4	-5.1	5.1	101.1	1.1	1.1	103.4	3.4	3.4
25-29	0.089	0.084	0.085	97.0	-2.4	2.4	98.5	-1.5	1.5	95.8	-4.2	4.2
30-34	0.048	0.022	0.026	85.1	-12.0	12.0	85.4	-14.6	14.6	92.7	-7.3	7.3
35-39	0.039	0.018	0.021	84.5	-0.6	0.6	101.1	1.1	1.1	97.3	-2.7	2.7
40-44	0.031	0.013	0.018	76.0	-8.5	8.5	81.1	-18.9	18.9	87.8	-12.2	12.2
45-49	0.034	0.015	0.019	79.6	3.6	3.6	115.1	15.1	15.1	111.9	11.9	11.9
50-54	0.029	0.013	0.016	78.9	-0.7	0.7	98.7	-1.3	1.3	97.8	-2.2	2.2
55-59	0.025	0.011	0.014	76.4	-2.6	2.6	94.9	-5.1	5.1	98.8	-1.2	1.2
60-64	0.022	0.010	0.012	80.4	4.0	4.0	70.4	-29.6	29.6	85.1	-14.9	14.9
65+	0.082	0.017	0.015									
NS	0.001	0.000	0.000									
Total	100	49.2	50.8	96.9		44.6			97.1			63.9
					Average:	3.7		Average:	8.1		Average:	5.3
					Combined Index:	24.6						

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.462	0.238	0.228	102.1
15-49	0.430	0.208	0.222	93.7
50+	0.107	0.050	0.057	88.4
15-64	0.506	0.241	0.264	91.2

A.1h: Age Distribution of the Resident Population, by sex

Region SHABA

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.025	0.012	0.013	98.1								
1	0.043	0.022	0.021	102.9	---	---	---	---	---	---	---	---
0-4	0.183	0.092	0.091	100.8								
5-9	0.150	0.080	0.079	100.7	-0.1	0.1	98.2	-0.8	0.8	98.9	-1.1	1.1
10-14	0.138	0.069	0.069	99.7	-0.9	0.9	103.0	3.0	3.0	103.9	3.9	3.9
15-19	0.108	0.054	0.054	100.6	0.9	0.9	95.2	-4.8	4.8	91.9	-8.1	8.1
20-24	0.093	0.045	0.048	93.5	-7.2	7.2	100.8	0.8	0.8	106.5	6.5	6.5
25-29	0.071	0.035	0.036	96.0	2.6	2.6	97.5	-2.5	2.5	95.7	-4.3	4.3
30-34	0.054	0.027	0.028	95.8	-0.2	0.2	95.1	-4.9	4.9	94.6	-5.4	5.4
35-39	0.044	0.021	0.023	94.2	-1.6	1.6	101.8	1.8	1.8	101.5	1.5	1.5
40-44	0.032	0.015	0.017	90.8	-3.4	3.4	83.3	-16.7	16.7	84.8	-15.2	15.2
45-49	0.032	0.015	0.017	90.0	-0.9	0.9	107.1	7.1	7.1	111.5	11.5	11.5
50-54	0.026	0.013	0.013	97.2	7.2	7.2	101.8	1.8	1.8	97.1	-2.9	2.9
55-59	0.021	0.010	0.011	97.2	-0.0	0.0	92.9	-7.1	7.1	93.9	-6.1	6.1
60-64	0.019	0.009	0.009	99.5	2.3	2.3	80.7	-19.3	19.3	99.5	-0.5	0.5
65+	0.021	0.013	0.008									
NS	0.001	0.000	0.000									
Total	100	49.8	50.2	99.0		27.3			70.5			67.1
					Average:	2.3		Average:	5.9		Average:	5.6
					Combined Index	18.3						

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.480	0.240	0.239	100.4
15-49	0.433	0.212	0.222	95.5
50+	0.087	0.045	0.041	109.3
15-64	0.499	0.244	0.255	95.8

A.1i: Age Distribution of the Resident Population, by sex

Region BANDUNDU

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.021	0.011	0.011	99.5								
1	0.039	0.019	0.019	100.7								
0-4	0.164	0.082	0.082	99.8	---	---	---	---	---	---	---	---
5-9	0.149	0.074	0.075	98.8	-1.0	1.0	99.1	-0.9	0.9	100.7	0.7	0.7
10-14	0.135	0.068	0.067	100.4	2.1	2.1	102.4	2.4	2.4	101.3	1.3	1.3
15-19	0.115	0.058	0.057	100.8	0.4	0.4	101.6	1.6	1.6	99.5	-0.5	0.5
20-24	0.095	0.046	0.048	96.3	-4.4	4.4	102.1	2.1	2.1	101.4	1.4	1.4
25-29	0.071	0.033	0.038	88.1	-8.3	8.3	99.5	-0.5	0.5	99.2	-0.8	0.8
30-34	0.048	0.020	0.028	72.8	-15.2	15.2	78.2	-21.8	21.8	84.6	-15.4	15.4
35-39	0.046	0.018	0.028	66.2	-6.6	6.6	106.5	6.5	6.5	111.7	11.7	11.7
40-44	0.036	0.014	0.022	65.2	-1.0	1.0	81.5	-18.5	18.5	86.9	-13.1	13.1
45-49	0.039	0.017	0.023	73.5	8.3	8.3	113.9	13.9	13.9	110.6	10.6	10.6
50-54	0.034	0.015	0.019	78.5	4.9	4.9	107.7	7.7	7.7	108.8	8.8	8.8
55-59	0.024	0.011	0.013	89.6	11.2	11.2	89.3	-10.7	10.7	81.5	-18.5	18.5
60-64	0.022	0.010	0.012	87.2	-2.4	2.4	88.1	-11.9	11.9	105.4	5.4	5.4
65+	0.021	0.012	0.010									
NS	0.001	0.000	0.000									
Total	100	47.9	52.1	91.8		66.0			98.3			88.2
					Average:	5.5		Average:	8.2		Average:	7.3

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.449	0.224	0.225	99.3
15-49	0.450	0.207	0.243	85.1
50+	0.101	0.048	0.053	91.2
15-64	0.530	0.243	0.286	84.9

Combined Index 32.0

A.1j: Age Distribution of the Resident Population, by sex

Region HAUT-ZAIRE

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.021	0.011	0.011	101.4								
1	0.034	0.017	0.017	101.6								
0-4	0.153	0.076	0.076	99.9	---	---	---	---	---			
5-9	0.134	0.067	0.068	98.7	-1.2	1.2	99.5	-0.5	0.5	101.2	1.2	1.2
10-14	0.115	0.058	0.057	101.1	2.4	2.4	103.1	3.1	3.1	100.5	0.5	0.5
15-19	0.092	0.045	0.046	98.6	-2.5	2.5	87.1	-12.9	12.9	85.1	-14.9	14.9
20-24	0.098	0.047	0.051	90.9	-7.7	7.7	109.9	9.9	9.9	119.0	19.0	19.0
25-29	0.079	0.039	0.040	98.3	7.3	7.3	105.4	5.4	5.4	97.1	-2.9	2.9
30-34	0.059	0.028	0.031	90.0	-8.3	8.3	85.7	-14.3	14.3	89.9	-10.1	10.1
35-39	0.055	0.026	0.029	89.1	-0.9	0.9	110.6	10.6	10.6	106.9	6.9	6.9
40-44	0.042	0.019	0.023	81.1	-8.1	8.1	80.4	-19.6	19.6	83.5	-16.5	16.5
45-49	0.048	0.021	0.027	78.9	-2.2	2.2	113.9	13.9	13.9	118.0	18.0	18.0
50-54	0.041	0.018	0.022	82.4	3.5	3.5	103.5	3.5	3.5	103.0	3.0	3.0
55-59	0.030	0.014	0.016	87.0	4.6	4.6	92.6	-7.4	7.4	90.6	-9.4	9.4
60-64	0.026	0.012	0.014	89.4	2.4	2.4	85.5	-14.5	14.5	92.6	-7.4	7.4
65+	0.028	0.015	0.013									
NS	0.001	0.000	0.000									
Total	100	48.5	51.5	94.4		51.0			115.7			110.0
					Average:	4.2		Average:	9.6		Average:	9.2

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.402	0.201	0.201	99.8
15-49	0.472	0.225	0.247	91.0
50+	0.125	0.059	0.066	90.4
15-64	0.569	0.270	0.300	90.1

Combined Index 31.5

A.1k: Age Distribution of the Resident Population, by sex

Region KIVU

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio	Successive Differences	Successive Differences (in absolute terms)	Age Ratios (masculine)	Difference from 100	Difference from 100	Age Ratios (feminine)	Difference from 100	Difference from 100
0	0.028	0.014	0.014	98.0								
1	0.041	0.021	0.021	98.5								
0-4	0.183	0.091	0.092	98.4	---	---	---	---	---			
5-9	0.153	0.076	0.077	99.4	1.0	1.0	99.7	-0.3	0.3	98.6	-1.4	1.4
10-14	0.126	0.063	0.064	98.1	-1.3	1.0	98.6	-1.4	1.4	100.2	0.2	0.2
15-19	0.101	0.050	0.050	100.4	2.3	2.3	92.3	-7.7	7.7	88.9	-11.1	11.1
20-24	0.096	0.047	0.049	95.0	-5.5	5.5	108.2	8.2	8.2	111.4	11.4	11.4
25-29	0.074	0.036	0.038	94.2	-0.8	0.8	98.9	-1.1	1.1	96.6	-3.4	3.4
30-34	0.056	0.026	0.030	87.1	-7.1	7.1	90.5	-9.5	9.5	95.3	-4.7	4.7
35-39	0.046	0.022	0.025	87.8	0.7	0.7	104.4	4.4	4.4	100.9	0.9	0.9
40-44	0.034	0.015	0.019	81.4	-6.4	6.4	85.2	-14.8	14.8	88.4	-11.6	11.6
45-49	0.033	0.015	0.018	80.0	-1.4	1.4	105.3	5.3	5.3	103.9	3.9	3.9
50-54	0.028	0.012	0.016	78.1	-3.9	3.9	101.3	1.3	1.3	108.9	8.9	8.9
55-59	0.021	0.009	0.011	84.7	6.6	6.6	86.7	-13.3	13.3	83.2	-16.8	16.8
60-64	0.021	0.010	0.011	88.8	4.1	4.1	79.1	-20.9	20.9	93.5	-6.5	6.5
65+	0.027	0.015	0.012									
NS	0.000	0.000	0.000									
Total	100	48.7	51.3	95.0		42.7			88.2			80.8
					Average:	3.6		Average:	7.4		Average:	6.7

Age Group	% Share Total	% Share Masculine	% Share Feminine	Sex Ratio
0-14	0.469	0.230	0.238	96.7
15-49	0.441	0.211	0.230	91.9
50+	0.098	0.046	0.050	92.3
15-64	0.510	0.242	0.268	90.6

Combined Index: 24.8

A.1l: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

ZAIRE

Age Group	Proportion in each age group c(x)		North Model Level 12	North Model Level 12	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1735	0.1668	0.1783	0.1726	0.99	0.97
5-9	0.1509	0.1454	0.1434	0.1389	1.08	1.05
10-14	0.1323	0.1268	0.1218	0.1185	1.10	1.07
15-19	0.1097	0.1050	0.1039	0.1018	1.06	1.03
20-24	0.0957	0.0967	0.0881	0.0872	1.08	1.11
25-29	0.0740	0.0748	0.0741	0.0743	0.99	1.01
30-34	0.0521	0.0561	0.0623	0.063	0.82	0.89
35-39	0.0446	0.0490	0.0521	0.0532	0.84	0.92
40-44	0.0320	0.0373	0.0433	0.0446	0.72	0.84
45-49	0.0346	0.0399	0.0356	0.0372	0.94	1.07
50-54	0.0297	0.0333	0.0288	0.0308	0.99	1.08
55-59	0.0230	0.0248	0.0174	0.0249	0.97	1.00
60-64	0.0202	0.0217	0.0125	0.0195	1.11	1.11
65+	0.0277	0.0225	0.0154	0.0333	0.79	0.68
NS	NA		NA			
Total	100	100	100	100		

A.1m: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region KINSHASA

Age Group	Proportion in each age group c(x)		North Model Level 17	North Model Level 15	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1616	0.1656	0.1603	0.1552	1.01	1.07
5-9	0.1484	0.1555	0.135	0.131	1.10	1.19
10-14	0.1297	0.1419	0.1169	0.114	1.11	1.24
15-19	0.1081	0.1247	0.1013	0.0994	1.07	1.25
20-24	0.1068	0.1160	0.0873	0.0864	1.22	1.34
25-29	0.0900	0.0903	0.0749	0.0748	1.20	1.21
30-34	0.0690	0.0623	0.0642	0.0646	1.08	0.96
35-39	0.0582	0.0483	0.0548	0.0556	1.06	0.87
40-44	0.0352	0.0274	0.0466	0.0477	0.76	0.57
45-49	0.0339	0.0257	0.0393	0.0406	0.86	0.63
50-54	0.0246	0.0165	0.0327	0.0343	0.75	0.48
55-59	0.0157	0.0108	0.0268	0.0286	0.59	0.38
60-64	0.0089	0.0065	0.0212	0.0231	0.42	0.28
65+	0.0100	0.0085	0.0385	0.0445	0.26	0.19
Total (ex.NS)	119450	114786				
Total	100	100	100	100		

A.1n: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region BAS-ZAIRE

Age Group	Proportion in each age group c(x)		North Model Level 14	North Model Level 13	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1719	0.1615	0.1798	0.1743	0.96	0.93
5-9	0.1534	0.1454	0.1452	0.1406	1.06	1.03
10-14	0.1422	0.1318	0.1228	0.1197	1.16	1.10
15-19	0.1204	0.1118	0.1043	0.1023	1.15	1.09
20-24	0.0861	0.0899	0.088	0.0872	0.98	1.03
25-29	0.0665	0.0737	0.0737	0.0739	0.90	1.00
30-34	0.0503	0.0525	0.0617	0.0624	0.82	0.84
35-39	0.0399	0.0459	0.0514	0.0525	0.78	0.87
40-44	0.0279	0.0354	0.0426	0.0439	0.65	0.81
45-49	0.0340	0.0395	0.0349	0.0365	0.98	1.08
50-54	0.0292	0.0339	0.0282	0.0301	1.04	1.13
55-59	0.0232	0.0270	0.0223	0.0243	1.04	1.11
60-64	0.0214	0.0227	0.0171	0.0191	1.25	1.19
65+	0.0335	0.0291	0.0276	0.0331	1.21	0.88
Total (ex.NS)	88550	92910				
Total	100	100	100	100		

A.1o: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region EQUATEUR

Age Group	Proportion in each age group c(x)		North Model Level 13	North Model Level 12	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1699	0.1618	0.1783	0.1726	0.95	0.93
5-9	0.1460	0.1379	0.1434	0.1389	1.02	0.99
10-14	0.1285	0.1207	0.1218	0.1185	1.05	1.02
15-19	0.1117	0.1034	0.1039	0.1018	1.07	1.02
20-24	0.0970	0.0955	0.0881	0.0872	1.10	1.09
25-29	0.0707	0.0711	0.0741	0.0743	0.95	0.96
30-34	0.0484	0.0529	0.0623	0.063	0.78	0.84
35-39	0.0414	0.0473	0.0521	0.0532	0.80	0.89
40-44	0.0320	0.0356	0.0433	0.0446	0.74	0.80
45-49	0.0366	0.0433	0.0356	0.0372	1.03	1.16
50-54	0.0344	0.0384	0.0288	0.0308	1.19	1.25
55-59	0.0267	0.0309	0.0228	0.0249	1.17	1.24
60-64	0.0231	0.0274	0.0174	0.0195	1.33	1.40
65+	0.0336	0.0344	0.0288	0.0333	1.17	1.03
Total (ex.NS)	154707	162753				
Total	100	100	100	100		

A.1p: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region KASAI-OCCIDENTAL

Age Group	Proportion in each age group c(x)		North Model Level 12	North Model Level 11	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1679	0.1640	0.1767	0.171	0.95	0.96
5-9	0.1456	0.1412	0.1415	0.137	1.03	1.03
10-14	0.1340	0.1257	0.1206	0.1174	1.11	1.07
15-19	0.1164	0.1077	0.1035	0.1014	1.12	1.06
20-24	0.0957	0.0923	0.0882	0.0873	1.08	1.06
25-29	0.0736	0.0748	0.0746	0.0747	0.99	1.00
30-34	0.0471	0.0554	0.0629	0.0637	0.75	0.87
35-39	0.0434	0.0510	0.0529	0.0539	0.82	0.95
40-44	0.0310	0.0398	0.0441	0.0453	0.70	0.87
45-49	0.0388	0.0456	0.0363	0.038	1.07	1.20
50-54	0.0335	0.0377	0.0295	0.0314	1.13	1.20
55-59	0.0275	0.0278	0.0233	0.0255	1.18	1.07
60-64	0.0212	0.0224	0.0178	0.02	1.19	1.12
65+	0.0242	0.0158	0.0282	0.0334	0.86	0.47
Total (ex.NS)	104740	108911				
Total	100	100	100	100		

A.1q: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region: KASAI-ORIENTAL

Age Group	Proportion in each age group c(x)		North Model Level 13	North Model Level	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1838	0.1743	0.1984	0.1726	0.93	1.01
5-9	0.1526	0.1467	0.1551	0.1389	0.98	1.06
10-14	0.1379	0.1291	0.128	0.1185	1.08	1.09
15-19	0.1193	0.1105	0.1063	0.1018	1.12	1.09
20-24	0.0953	0.0928	0.0875	0.0872	1.09	1.06
25-29	0.0692	0.0691	0.0716	0.0743	0.97	0.93
30-34	0.0452	0.0514	0.0585	0.063	0.77	0.82
35-39	0.0368	0.0419	0.0476	0.0532	0.77	0.79
40-44	0.0272	0.0347	0.0385	0.0446	0.71	0.78
45-49	0.0305	0.0371	0.0307	0.0372	0.99	1.00
50-54	0.0258	0.0316	0.0242	0.0308	1.06	1.03
55-59	0.0217	0.0275	0.0186	0.0249	1.17	1.11
60-64	0.0200	0.0241	0.0138	0.0195	1.45	1.24
65+	0.0351	0.0291	0.021	0.0333	1.67	0.87
Total (ex.NS)	108257	111771				
Total	100	100	100	100		

A.1r: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region SHABA

Age Group	Proportion in each age group c(x)		North Model Level 13	North Model Level 12	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1846	0.1813	0.1783	0.1929	1.04	0.94
5-9	0.1603	0.1576	0.1434	0.1508	1.12	1.05
10-14	0.1385	0.1375	0.1218	0.1251	1.14	1.10
15-19	0.1088	0.1070	0.1039	0.1045	1.05	1.02
20-24	0.0901	0.0955	0.0881	0.0870	1.02	1.10
25-29	0.0700	0.0722	0.0741	0.0721	0.95	1.00
30-34	0.0536	0.0554	0.0623	0.0595	0.86	0.93
35-39	0.0427	0.0449	0.0521	0.0488	0.82	0.92
40-44	0.0303	0.0331	0.0433	0.0398	0.70	0.83
45-49	0.0301	0.0331	0.0356	0.0323	0.85	1.02
50-54	0.0258	0.0263	0.0288	0.0259	0.90	1.02
55-59	0.0207	0.0211	0.0228	0.0204	0.91	1.03
60-64	0.0187	0.0186	0.0174	0.0156	1.07	1.19
65+	0.0256	0.0163	0.0279	0.0260	0.92	0.63
NS						
Total	100	100	100	100		

A.1s: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region BANDUNDU

Age Group	Proportion in each age group c(x)		North Model Level 13	North Model Level 12	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1711	0.1582	0.1783	0.1726	0.96	0.92
5-9	0.1548	0.1447	0.1434	0.1389	1.08	1.04
10-14	0.1412	0.1292	0.1218	0.1185	1.16	1.09
15-19	0.1210	0.1103	0.1039	0.1018	1.16	1.08
20-24	0.0971	0.0925	0.0881	0.0872	1.10	1.06
25-29	0.0692	0.0721	0.0741	0.0743	0.93	0.97
30-34	0.0420	0.0530	0.0623	0.063	0.67	0.84
35-39	0.0382	0.0530	0.0521	0.0532	0.73	1.00
40-44	0.0298	0.0420	0.0433	0.0446	0.69	0.94
45-49	0.0348	0.0435	0.0356	0.0372	0.98	1.17
50-54	0.0314	0.0368	0.0288	0.0308	1.09	1.19
55-59	0.0235	0.0241	0.0228	0.0249	1.03	0.97
60-64	0.0212	0.0223	0.0174	0.0195	1.22	1.14
65+	0.0246	0.0182	0.0279	0.0333	0.88	0.55
Total (ex.NS)	163565	178109				
Total	100	100	100	100		

A.1t: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region HAUT-ZAIRE

Age Group	Proportion in each age group c(x)		North Model Level 18	North Model Level 12	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1573	0.1488	0.1551	0.1495	1.01	0.99
5-9	0.1375	0.1315	0.1291	0.1243	1.07	1.06
10-14	0.1191	0.1112	0.1133	0.1096	1.05	1.01
15-19	0.0937	0.0896	0.0999	0.0973	0.94	0.92
20-24	0.0959	0.0995	0.0875	0.0861	1.10	1.16
25-29	0.0808	0.0776	0.0762	0.0759	1.06	1.02
30-34	0.0574	0.0602	0.0661	0.0665	0.87	0.91
35-39	0.0534	0.0565	0.0572	0.058	0.93	0.97
40-44	0.0390	0.0454	0.0491	0.0503	0.79	0.90
45-49	0.0437	0.0523	0.0417	0.0434	1.05	1.20
50-54	0.0378	0.0433	0.0349	0.0371	1.08	1.17
55-59	0.0292	0.0317	0.0286	0.031	1.02	1.02
60-64	0.0253	0.0267	0.0226	0.0251	1.12	1.06
65+	0.0300	0.0260	0.0386	0.0458	0.78	0.57
NS	0.0000	0.0000				
Total	100	100	100	100		

A.1u: Application of stable population models, by matching c(5) and Coale-Demeny Mortality Level

Region KIVU

Age Group	Proportion in each age group c(x)		North Model Level 12	North Model Level 11	Age Distribution Reported/Stable	
	Males	Females	Males	Females	Males	Females
0-4	0.1865	0.1800	0.1767	0.1912	1.06	0.94
5-9	0.1569	0.1500	0.1415	0.1490	1.11	1.01
10-14	0.1284	0.1243	0.1206	0.1241	1.06	1.00
15-19	0.1036	0.0980	0.1035	0.1042	1.00	0.94
20-24	0.0961	0.0962	0.0882	0.0872	1.09	1.10
25-29	0.0741	0.0747	0.0746	0.0726	0.99	1.03
30-34	0.0537	0.0586	0.0629	0.0601	0.85	0.97
35-39	0.0445	0.0482	0.0529	0.0495	0.84	0.97
40-44	0.0317	0.0370	0.0441	0.0405	0.72	0.91
45-49	0.0298	0.0354	0 9383	0.033	0.92	1.07
50-54	0.0249	0.0311	0.0295	0.0265	0.84	1.17
55-59	0.0194	0.0218	0.0233	0.021	0.83	1.04
60-64	0.0198	0.0212	0.0178	0.0159	1.11	1.33
65+	0.0307	0.0236	0.0282	0.0253	1.09	0.93
Total (ex.NS)	232782	244980				
Total	100	100	100	100		

Table A.2a: Schedule of Age-Specific Fertility Rates

Kinshasa	1955	1984
15-19	0.195	0.047
20-24	0.300	0.188
25-29	0.267	0.245
30-34	0.236	0.227
35-39	0.131	0.168
40-44	0.131	0.092
45-49	0.028	0.024

Bas-Zaire		
15-19		0.078
20-24		0.245
25-29		0.285
30-34	n.a.	0.208
35-39		0.191
40-44		0.105
45-49		0.037

Equateur		
15-19	0.089	0.093
20-24	0.249	0.247
25-29	0.219	0.276
30-34	0.166	0.252
35-39	0.072	0.169
40-44	0.072	0.104
45-49	0.011	0.036

Kasai-Occidental		
15-19		0.088
20-24		0.252
25-29		0.284
30-34	n.a.	0.254
35-39		0.190
40-44		0.091
45-49		0.035

Table A.2a: Schedule of Age-Specific Fertility Rates

Kasai-Oriental	1955	1984
15-19		0.105
20-24		0.268
25-29		0.299
30-34	n.a.	0.291
35-39		0.217
40-44		0.117
45-49		0.037
Shaba		
15-19	0.210	0.118
20-24	0.366	0.286
25-29	0.251	0.306
30-34	0.186	0.262
35-39	0.105	0.210
40-44	0.105	0.127
45-49	0.022	0.034
Bandundu		
15-19		0.085
20-24		0.222
25-29		0.275
30-34	n.a.	0.257
35-39		0.191
40-44		0.109
45-49		0.035
Haut-Zaire		
15-19	0.134	0.092
20-24	0.261	0.233
25-29	0.147	0.223
30-34	0.103	0.200
35-39	0.048	0.127
40-44	0.048	0.065
45-49	0.012	0.027

Table A.2a: Schedule of Age-Specific Fertility Rates

Kivu	1955	1984
15-19	0.182	0.082
20-24	0.290	0.288
25-29	0.261	0.315
30-34	0.182	0.300
35-39	0.086	0.225
40-44	0.086	0.135
45-49	0.018	0.045
ZAIRE		
15-19	0.136	0.084
20-24	0.265	0.247
25-29	0.231	0.278
30-34	0.168	0.259
35-39	0.080	0.186
40-44	0.080	0.105
45-49	0.032	0.035

n.a.-- not available
afemo4

Table A.2b: Changes in Average Parities, 1955-84

Kinshasa

	Survey (1955)	Demo. Survey (1967)	EDOZA (1976)	Census (1984	CPS (1982-84)	Percentage Change 55-84 (Census)
15-19	0.48	0.52	0.15	0.16	0.10	-67
20-24	1.47	2.12	1.40	1.08	1.30	-27
25-29	2.55	3.70	3.30	2.78	3.10	9
30-34	3.42	5.02	4.68	4.51	4.90	32
35-39	3.74	5.60	6.30	6.16	6.70	65
40-44	3.74	5.85	5.94	6.94	6.90	86
45-49	2.93	n.a.	7.47	7.10	6.90	142

Bas-Zaire

	1955 Survey	1975/76 EDOZA	1984 Census	Percentage Change: 55/76	76/84	55-84
15-19	0.20	0.18	0.21	-8	17	8
20-24	1.38	1.52	1.33	10	-12	-3
25-29	2.99	3.51	3.02	17	-14	1
30-34	4.64	5.14	4.58	11	-11	-1
35-39	5.96	6.20	6.16	4	-1	3
40-44	5.96	7.07	6.95	19	-2	17
45-49	6.17	6.95	7.23	13	4	17

Equateur (sub-region):

	1955 Survey	1975/76 EDOZA	1984 Census	Percentage Change: 55/76	76/84	55-84
15-19	0.25	0.31	0.39	24	25	56
20-24	0.97	1.61	1.67	66	4	72
25-29	1.46	3.38	3.33	132	-1	128
30-34	1.97	4.71	4.68	139	-1	138
35-39	2.37	5.13	5.61	116	9	137
40-44	2.37	3.79	6.06	60	60	156
45-49	2.56	3.79	5.86	52	55	134

Table A.2b: Changes in Average Parities, 1955-84

Tshuapa (sub-region):

	1955 Survey	1975/76 EDOZA	1984 Census	Percentage Change: 55/76	76/84	55-84
15-19	0.16	0.27	0.28	69	2	78
20-24	0.75	1.44	1.41	92	-2	88
25-29	1.33	2.76	3.01	108	9	126
30-34	1.94	3.72	4.22	92	13	117
35-39	2.38	4.36	4.84	83	11	103
40-44	2.38	4.36	5.11	83	17	115
45-49	2.79	3.09	4.81	11	56	73

Kasai-Occidental:

	1955 Survey	1975/76 EDOZA	1984 Census	Percentage Change: 55/76	76/84	55-84
15-19		0.28	0.27		-2	
20-24		1.87	1.46		-22	
25-29		3.50	3.21		-8	
30-34	n.a.	5.01	4.61	n.a.	-8	n.a.
35-39		5.74	5.93		3	
40-44		6.00	6.43		7	
45-49		5.25	6.19		18	

Bandundu:

	1955 Survey	1975/76 EDOZA	1984 Census	Percentage Change: 55/76	76/84	55-84
15-19	0.20	0.17	0.22	-14	27	10
20-24	1.28	1.40	1.24	9	-11	-3
25-29	2.56	3.11	2.94	21	-5	15
30-34	3.69	4.75	4.33	29	-9	17
35-39	4.78	5.82	5.78	24	-1	23
40-44	4.78	6.32	6.44	34	2	37
45-49	4.88	6.19	6.43	27	4	32

Table A.2b: Changes in Average Parities, 1955-84

Shaba

	1955 Survey	1984 Census	Percentage Change: 55-84
15-19	0.54	0.37	-31
20-24	1.66	1.77	6
25-29	2.46	3.63	47
30-34	3.29	5.28	60
35-39	3.83	6.65	74
40-44	3.83	7.17	87
45-49	3.70	7.04	90

Haut-Zaire

	1955 Survey	1984 Census	Percentage Change: 55-84
15-19	0.35	0.301	-14
20-24	1.23	1.386	13
25-29	1.63	2.690	65
30-34	2.07	3.726	80
35-39	2.54	4.402	73
40-44	2.54	4.534	78
45-49	2.72	4.236	56

Kivu

	1955 Survey	1984 Census	Percentage Change: 55-84
15-19	0.52	0.244	-53
20-24	2.02	1.413	-30
25-29	3.32	3.142	-5
30-34	4.33	4.705	9
35-39	4.98	6.691	25
40-44	4.98	6.859	41
45-49	4.42	6.842	55

N.A.-- Not Available
The parity for 35-44 age group is presented under 35-39 and 40-44 age g
The parity for 45-54 age group is presented under 45-49 for 1955.

afcme4

Table A.2c: Kinshasa: Comparative Fertility Indicators, Selective Years

Year	Crude Birth Rate	General Fertility Rate
1955 (Adjust.)	53.5	248
1967	55.8	282
1976	54.9	
1984 (Census,Rept)	38.7	152
1982-84 (CPS)		187
1984 (Adjust. P/F)	53.9	223

Percentage Change:

Period:	Crude Birth Rate	General Fertility Rate
55-67	4.3	7.8
67-76	-1.6	
67-84	-34.2	-42.8
55-84	-31.4	-37.4
55-84 (CPS)		-31.3

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Table A.2d: Comparative fertility indices from 1955-58 and 1975-76 surveys, and 1984 Census for western regions of Zaire

Region	Percentage of childless women aged 25-34 years			Average number of children ever born to women aged 35-54 years a/			General Fertility Rate per thousand women aged 15-44 years			Crude Birth Rate per 1000		
	1955-58	1975-76	1984	1955-58	1975-76	1984	1955-58	1975-76	1984	1955-58	1975-76	1984
BAS-ZAIRE		3.6			6.8			233			44.4	
Bas-Fleuve	11.5	3.1	6.4	5.5	6.2	6.7	194	233	198	48.6	42.8	48.8
Cataractes	6.7	3.9	6.4	6.6	7.2	6.9	189	229	188	45.6	43.6	48.5
Matadi		3.3			7.6			262			52.6	
BANDUNDU		4.9			6.1			203			44.6	
Kwango	5.3	4.1	7.6	5.3	6.4	6.2	203	195	181	48.1	43.4	43.1
Kwilu	13.1	5.7	7.6	4.9	5.8	6.3	179	198	174	45.2	43.2	39.4
Mai-Ndombe	16.7	6.6	6.4	4.2	5.6	6.5	189	222	191	44.3	45.5	46.9
Kikwit		6.6			5.4			n.a.			50.6	
Bandundu		3.5			7.3			203			47.6	
KASAI-OCCIDENTAL		5.5			5.1			205			46.5	
Kasai	19.2	6.4	7.6	4.3	5.6	6.6	173	206	195	45.3	42.5	45.4
Lulua	19.6	4.5	6.9	4.7	5.9	6.2	166	194	188	43.1	38.2	40.2
Kananga					4.9			223			45.6	
EQUATEUR												
Equateur	38.9	9.7	9.3	2.4	4.5	5.7	133	205	226	33.7	38.5	45.2
Tshuapa	42.3	13.2	12.3	2.6	3.7	4.7	113	169	176	30.5	33.3	34.7
Mbandaka		12.1			n.a.			n.a.			47.2	

a/ Arithmetic average of values for 35-44 and 45-54 age groups.

Sources: Romaniuk, A., Increase in Natural Fertility During the Early Stages of Modernization: Evidence from an African Case Study, Zaire; Synthese des Etudes Demographiques de l'Ouest du Zaire (EDOZA); and 1984 Census. (afamfer2)

Table A.2d: Comparative fertility indices from 1955-58 and 1975-76 surveys, and 1984 Census for western regions of Zaire

	Percentage Change:					
	General Fertility Rate			Crude Birth Rate		
	1955-76	1976-84	1955-84	1955-76	1976-84	1955-84
Region						
BAS-ZAIRE:						
Bas-Fleuve	0.20	-0.18	-0.02	-0.11	-0.05	-0.15
Cataractes	0.21	-0.18	-0.01	-0.04	-0.06	-0.10
BANDUNDU:						
Kwango	-0.04	-0.07	-0.11	-0.10	-0.01	-0.10
Kwilu	0.11	-0.12	-0.03	-0.04	-0.09	-0.13
Mai-Ndombe	0.17	-0.14	0.01	0.03	-0.10	-0.08
KASAI-OCCIDENTAL:						
Kasai	0.19	-0.05	0.13	-0.06	0.07	0.00
Lulua	0.17	-0.03	0.13	-0.16	0.11	-0.07
EQUATEUR:						
Equateur	0.54	0.10	0.70	0.14	0.17	0.34
Tshuapa	0.59	-0.02	0.56	0.09	0.04	0.14

ofemfer2

Table A.2a: Decomposition of the Crude Birth Rate: 1976 and 1984
Western Regions of Zaire (Kinshasa, Bas-Zaire, Bandundu, Equateur, Tshuapa, and Kasai-Occidental)

Region	Proportion of Women of Childbearing Age (F15-49/P)		Age Group	Age Structure of Women of Childbearing Age (Fi/F15-49)		Age Pattern of Nuptiality 1/ MF(i)/F(i)		Marital Fertility B(i)/MF(i)	
	1976	1984		1976	1984	1976	1984	1976	1984
Kinshasa	N.A.	0.24	15-19	N.A.	0.25	N.A.	0.110	N.A.	0.429
			20-24		0.23		0.488		0.886
			25-29		0.18		0.744		0.329
			30-34		0.13		0.815		0.279
			35-39		0.10		0.833		0.202
			40-44		0.06		0.805		0.114
			45-49		0.05		0.739		0.032
Bas-Zaire	0.21	0.23	15-19	0.26	0.25	N.A.	0.137	N.A.	0.533
			20-24	0.16	0.20		0.571		0.429
			25-29	0.13	0.16		0.758		0.376
			30-34	0.10	0.12		0.787		0.330
			35-39	0.13	0.10		0.778		0.245
			40-44	0.11	0.06		0.767		0.137
			45-49	0.10	0.09		0.708		0.052
Bandundu	N.A.	0.24	15-19	N.A.	0.24	N.A.	0.176	N.A.	0.868
			20-24		0.20		0.603		0.868
			25-29		0.15		0.785		0.350
			30-34		0.11		0.815		0.315
			35-39		0.11		0.818		0.233
			40-44		0.09		0.794		0.137
			45-49		0.09		0.718		0.048
Equateur (sub-region)	0.21	0.22	15-19	0.25	0.25	N.A.	0.306	N.A.	0.440
			20-24	0.15	0.22		0.741		0.881
			25-29	0.12	0.15		0.851		0.374
			30-34	0.11	0.12		0.864		0.333
			35-39	0.13	0.09		0.863		0.206
			40-44	0.12	0.06		0.860		0.147
			45-49	0.12	0.09		0.831		0.053
Tshuapa (sub-region)	0.21	0.22	15-19	0.22	0.23	N.A.	0.294	N.A.	0.427
			20-24	0.14	0.20		0.748		0.312
			25-29	0.12	0.16		0.883		0.305
			30-34	0.12	0.10		0.926		0.259
			35-39	0.14	0.10		0.918		0.179
			40-44	0.14	0.08		0.925		0.105
			45-49	0.13	0.13		0.896		0.038
Kasai-Occidental	N.A.	0.24	15-19	N.A.	0.23	N.A.	0.309	N.A.	0.271
			20-24		0.20		0.768		0.328
			25-29		0.16		0.872		0.326
			30-34		0.12		0.883		0.288
			35-39		0.11		0.868		0.219
			40-44		0.08		0.817		0.111
			45-49		0.10		0.728		0.048
Western Zaire 2/	N.A.	0.24	15-19	N.A.	0.26	0.230	0.180	N.A.	0.366
			20-24		0.22	0.721	0.600		0.871
			25-29		0.17	0.870	0.797		0.344
			30-34		0.11	0.885	0.825		0.302
			35-39		0.10	0.861	0.826		0.225
			40-44		0.07		0.796		0.127
			45-49		0.08	a/ 0.780	0.720		0.048

1/ Includes women in monogamous, & polygamous marriages & 'unions de fait'
2/ Kinshasa, Bas-Zaire, Bandundu, and Kasai-Occidental

a/ Refers to the age group 45-54

ago7684

Table A.2f: Population 15 years and older, by marital status, Western Zaire, 1955

	Masculine			Feminine		
	1955	1976	1984	1955	1976	1984
(1) Single	28.6	38.2	45.3	10.9	18.7	27.4
(2) Married monog.	50.3	47.2	41.6	44.9	44.0	41.0
(3) Polig.	10.8	9.4	8.1	21.5	18.1	14.0
(4) Unions de fait	5.9	1.5	2.2	5.2	2.2	3.4
(5) Married= 2+3+4	67.0	58.1	52.0	71.6	64.3	58.3
(6) Divorced	2.1	2.2	1.3	3.8	6.1	4.6
(7) Widowed	2.3	1.5	1.2	13.7	10.9	9.6
(8) Divorced & Widowed	4.4	3.7	2.5	17.5	17.0	14.1
Not Specified			0.2			0.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Change in Marital Status (Percentage)

	Masculine		Feminine	
	1955-76	1976-84	1955-76	1976-84
Single	9.6	7.1	7.8	8.7
Married	-8.9	-6.1	-7.3	-6.0
Divorced & Widowed	-0.7	-1.2	-0.5	-2.9
Not Spec.	0.0	0.2	0.0	0.2

1/ Kinshasa, Bas-Zaire, Bandundu, Kasai-Occidental

Source: EDOZA Survey; 1984 Census

nuptiale

Table A.2g: Summary Fertility Indicators, 1984

Region	Crude Birth Rate	General Fertility Rate	Total Fertility Rate	Mean Age of Childbearing	Crude Birth Rate	General Fertility Rate	Total Fertility Rate
	Reported				Adjusted by P/F Method		
Kinshasa	36.7	151.9	4.95	28.8	53.9	228	7.17
Bas-Zaire	49.3	176.6	5.99	29.5	50.9	222	7.35
Equateur	49.7	176.7	5.99	29.1	49.2	214	6.98
Kasai-Occid.	42.6	176.9	5.95	29.1	54.2	228	7.42
Kasai-Orient.	44.6	198.9	6.67	29.3	54.1	243	7.97
Shaba	46.5	209.8	6.83	29.1	58.4	264	8.34
Bandundu	49.3	165.9	5.76	29.8	53.5	229	7.34
Haut-Zaire	36.8	149.6	4.79	29.4	44.5	189	5.78
Kivu	47.3	206.1	6.85	29.8	58.4	245	7.95
TOTAL	42.8	179.6	5.97	29.3	52.9	226	7.39

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A.2h: General Fertility Rate, by sub-region
(per thousand women aged 15-49 years)

KINSHASA Sub-Region	General Fertility Rate
1	154.4
2	140.8
3	145.8
4	166.7
BAS-ZAIRE	
Sub-Region	
Matadi	148.3
City of Boma	165.9
Bas Fleuve	180.3
Cataractes	175.5
Lukaya	184.2
EQUATEUR	
Sub-Region	
City of Mbandaka	216.6
Equateur	207.5
Sud-Ubangi	163.8
Ville de Zongo	197.8
Nord-Ubangi	164.1
Mongala	195.8
Tshuapa	156.8
KASAI OCCIDENTAL	
Sub-Region	
City of Kananga	163.2
Lulua	171.1
Kasai	186.7

A.2h: General Fertility Rate, by sub-region
(per thousand women aged 15-49 years)

KASAI ORIENTAL	
Sub-Region	
City of Mbuji-Mayi	220.1
Tshilenge	187.5
Sankuru	169.8
Kabinda	217.8
SHABA	
Sub-Region	
Lubumbashi	201.8
City of Likasi	193.7
City of Kolwezi	222.6
Lualaba	176.4
Haut-Lomani	239.3
Tanganika	203.6
Haut-Shaba	201.9
BANDUNDU	
Sub-Region	
City of Bandundu	157.5
Mai-Ndombe	180.3
Kwilu	162.3
Ville de Kikwit	138.2
Kwango	167.6
HAUT-ZAIRE	
Sub-Region	
City of Kisangani	158.1
Tshopo	142.6
Bas-Uele	114.8
Haut-Uele	127.8
Ituri	178.4
KIVU	
Sub-Region	
City of Bukavu	214.8
Maniema	198.1
Nord-Kivu	199.8
Sud-Kivu	217.2

A.21: General Fertility Rates, by Type of Union, 1984

REGION	Average	Monogamous	Polygamous
Kinshasa	152	248	198
Bas-Zaire	176	255	222
Equateur	177	233	209
Kasai-Occidental	177	259	201
Kasai-Oriental	199	271	253
Shaba	210	285	237
Bandundu	166	248	204
Haut-Zaire	149	197	168
Kivu	206	292	251
ZAIRE	189	254	216

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FIGURES

Figures

Figure

Figure I.1a
Zaire: Analysis of age ratios, females

(Deviation from 100)

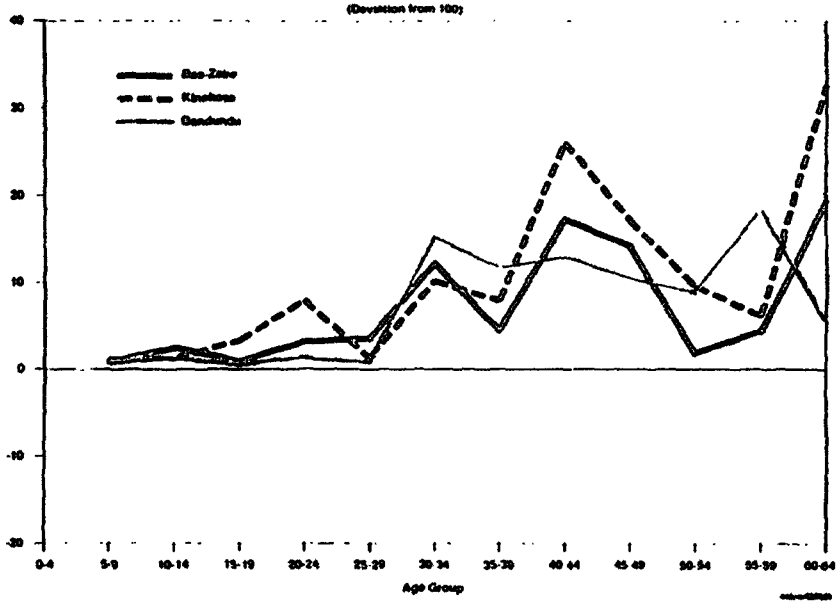


Figure I.1b
Zaire: Analysis of age ratios, females

(Deviation from 100)

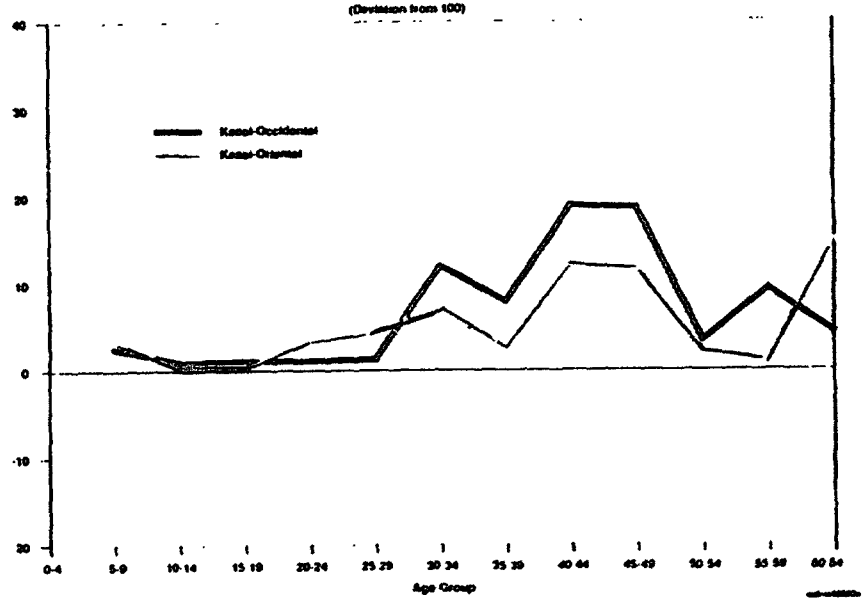


Figure I.1c
Zaire: Analysis of age ratios, females

(Deviation from 100)

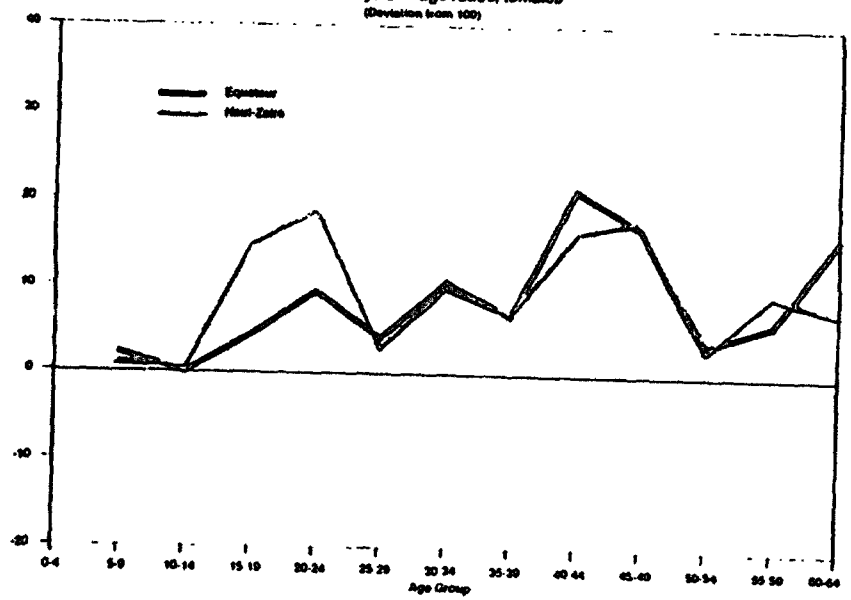


Figure I.1d
Zaire: Analysis of age ratios, females

(Deviation from 100)

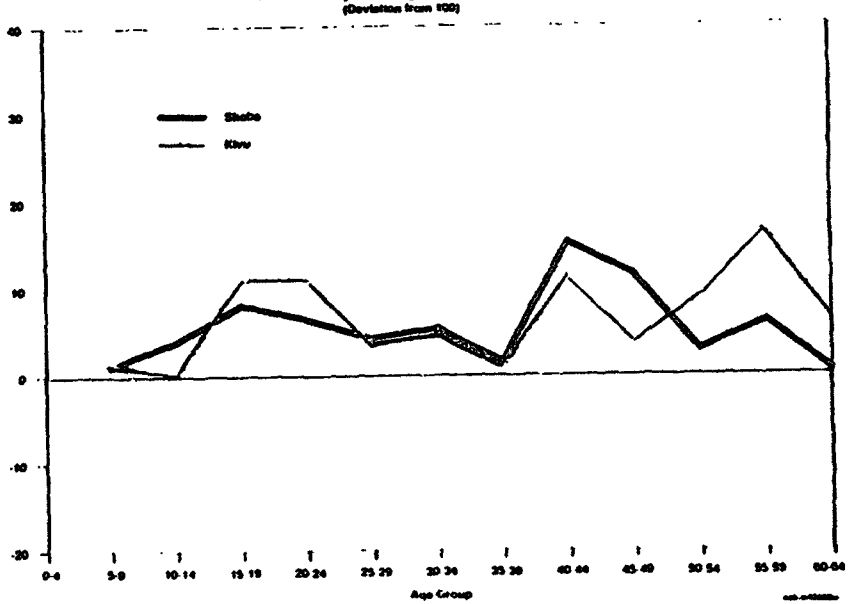


Figure I.1e
Zaire: Analysis of age ratios, males

(Deviation from 100)

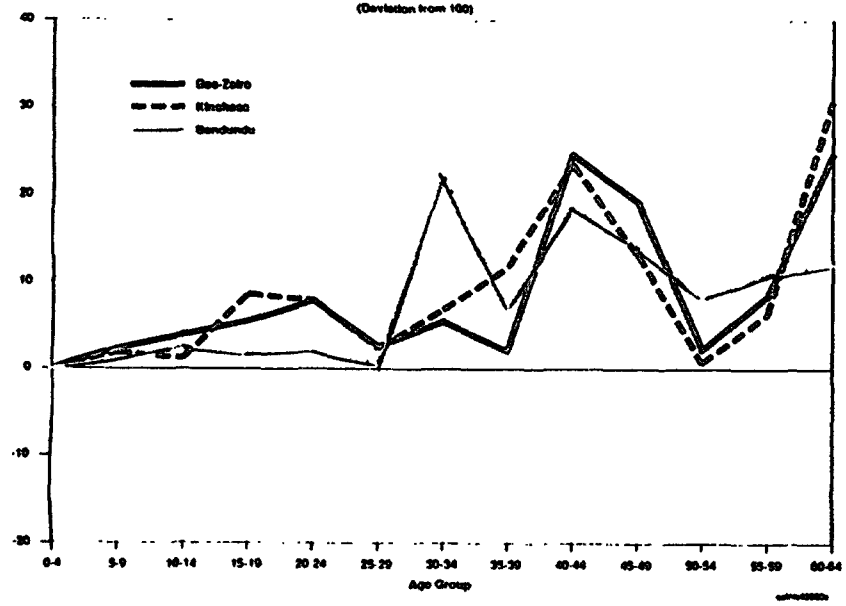


Figure I.1f
Zaire: Analysis of age ratios, males

(Deviation from 100)

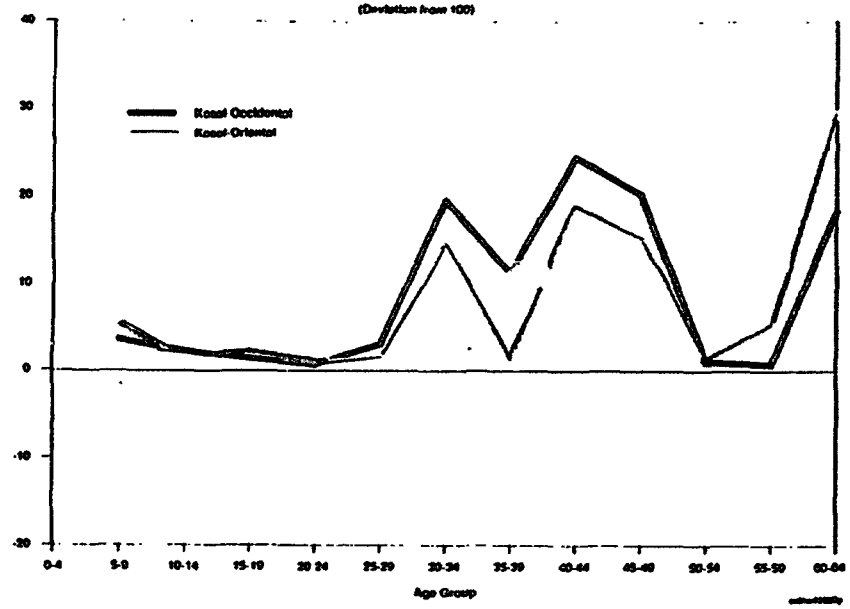


Figure I.1g
Zaire: Analysis of age ratios, males

(Deviation from 100)

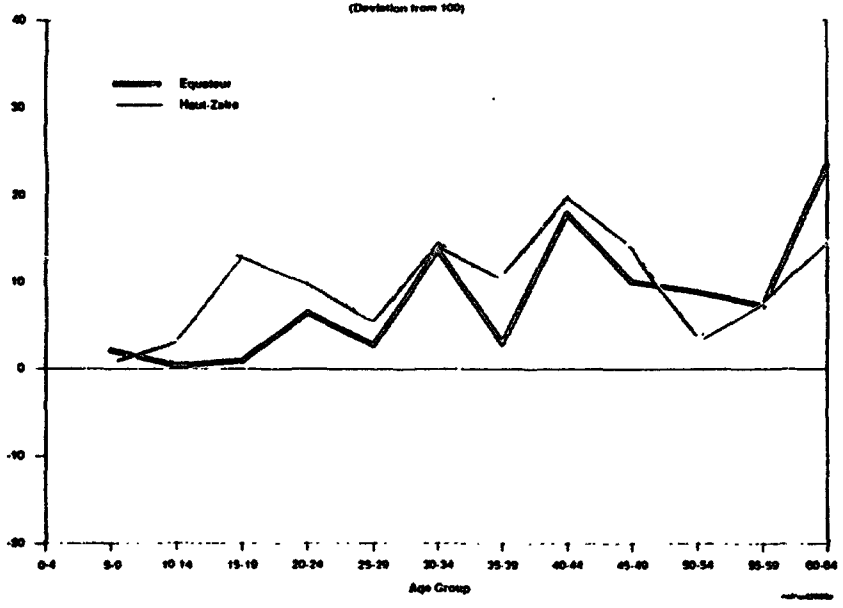


Figure I.1h
Zaire: Analysis of age ratios, males

(Deviation from 100)

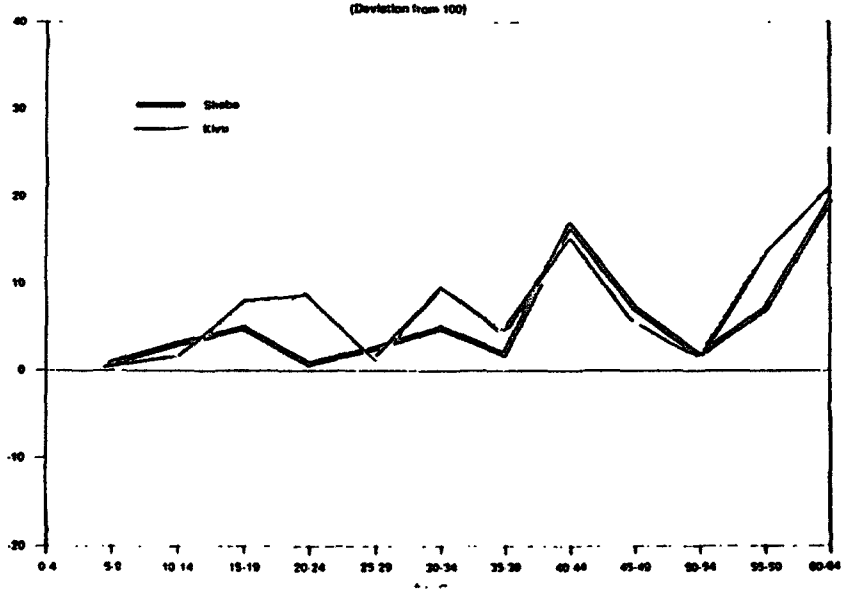


Figure I.1i
Zaire: Analysis of age ratios

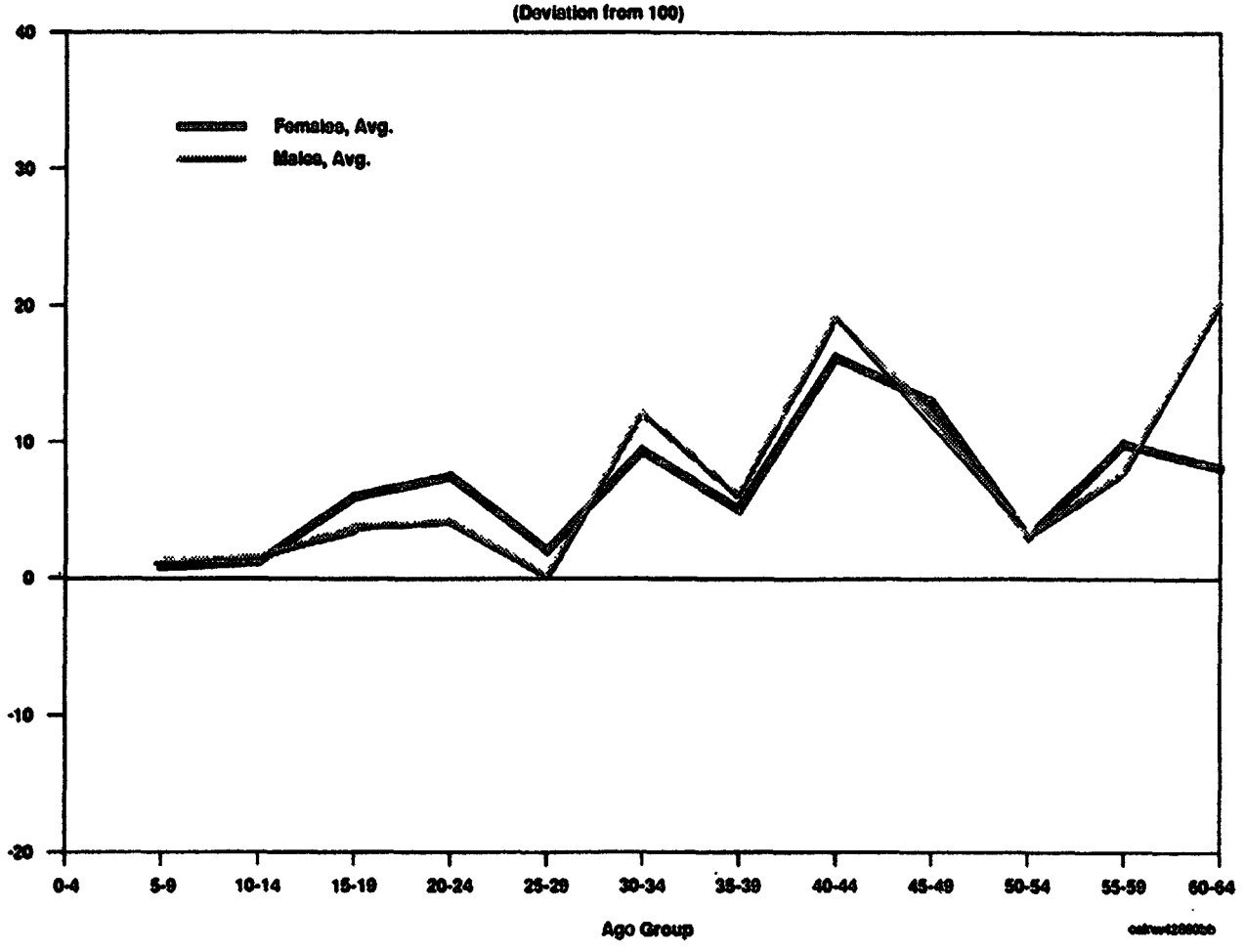


Figure I.2a
Zaire: Reported Age Distribution,

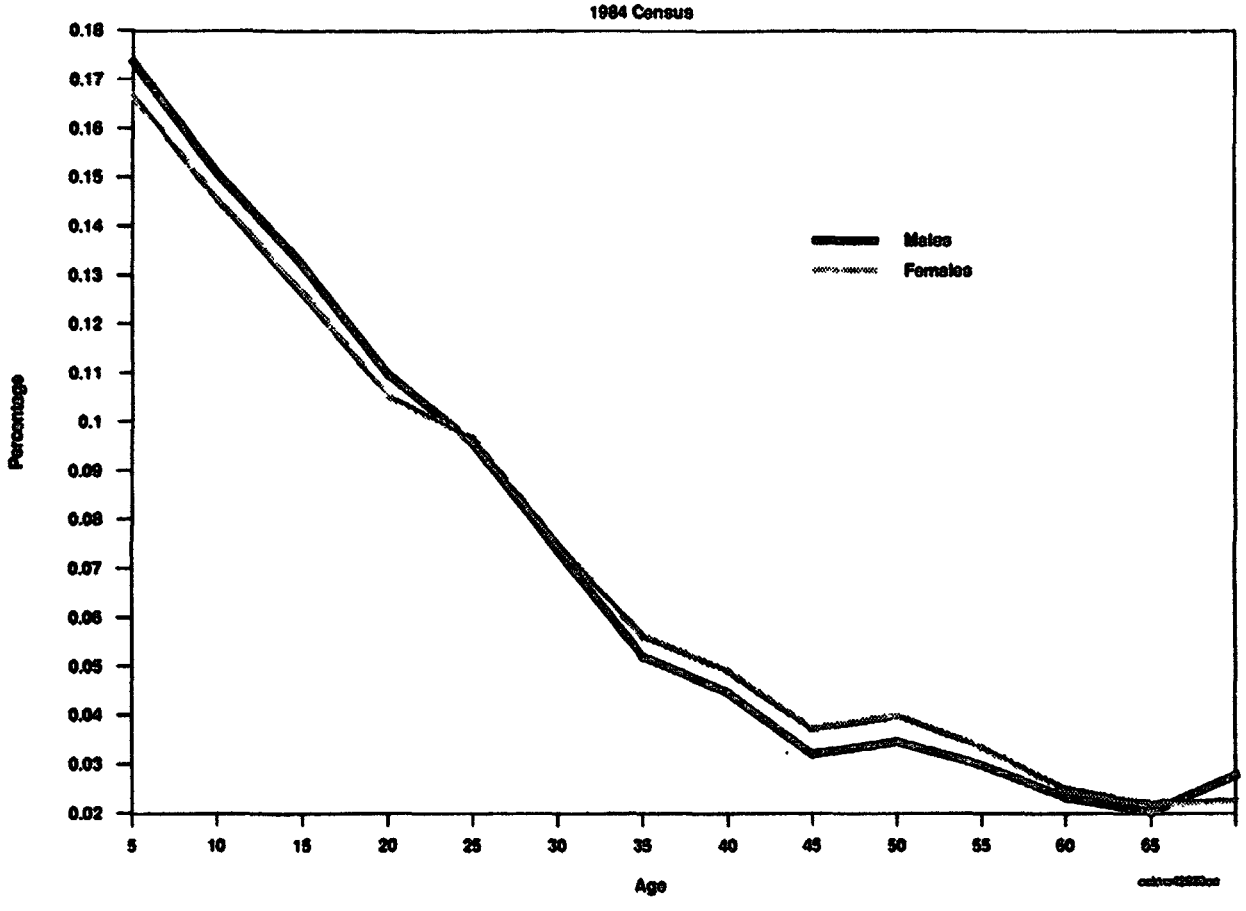


Figure I.2b

Zaire, sex ratio, by age

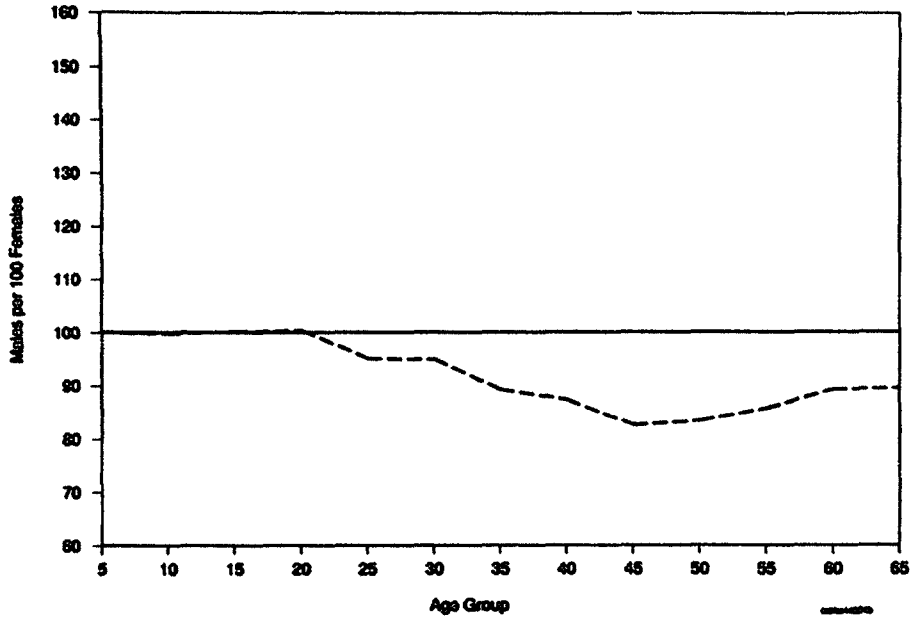


Figure I.2c

Kinshasa, sex ratio, by age

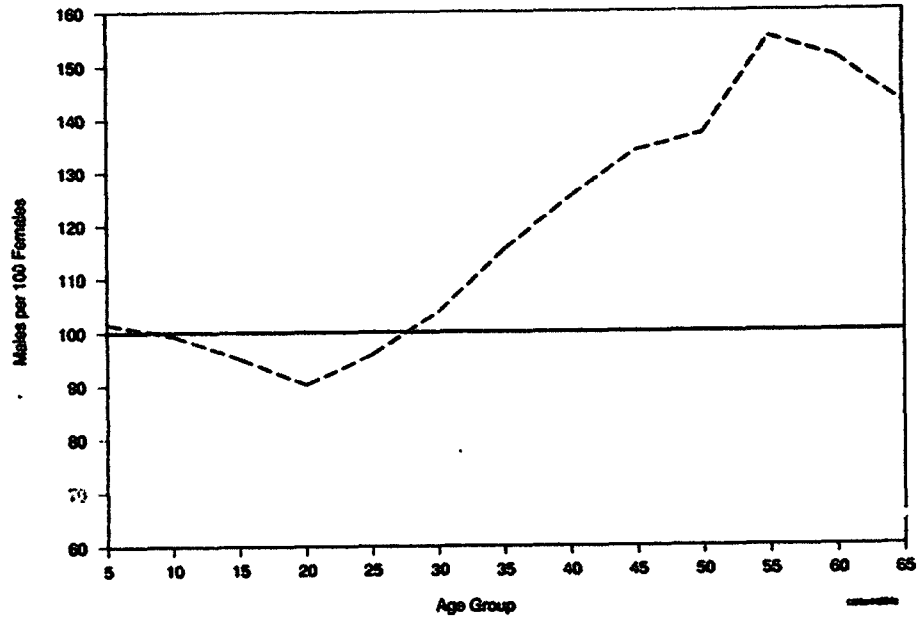


Figure I.2d

Bas-Zaire, sex ratio, by age

Figure I.2e

Equateur, sex ratio, by age

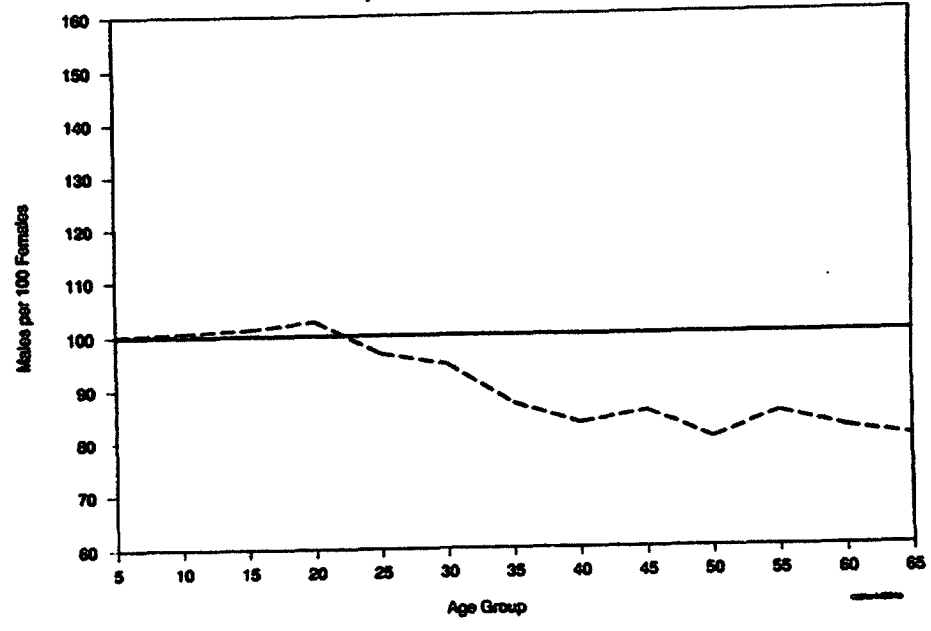


Figure I.2g
Kauai-Oriental, sex ratio, by age

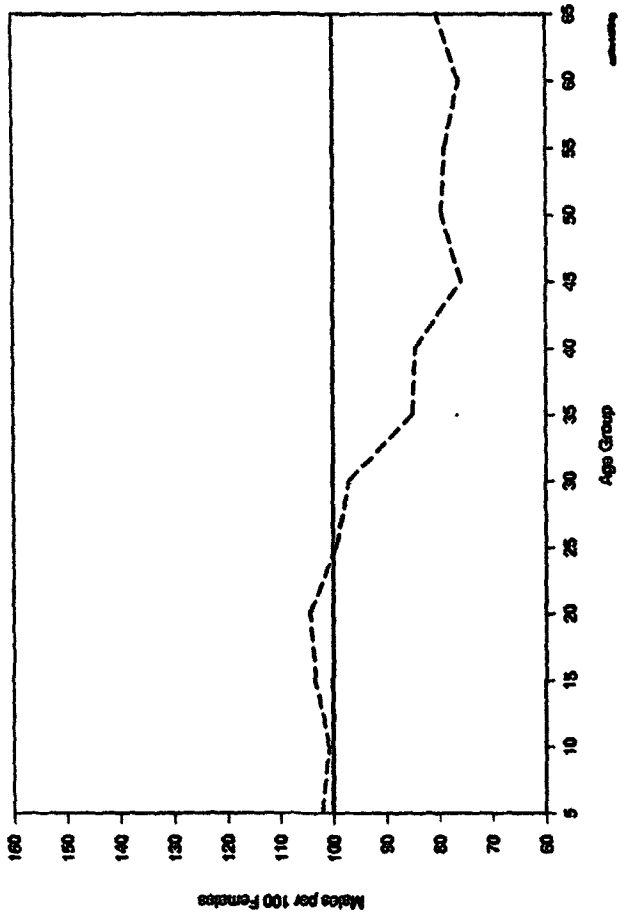


Figure I.2i
Bandundu, sex ratio, by age

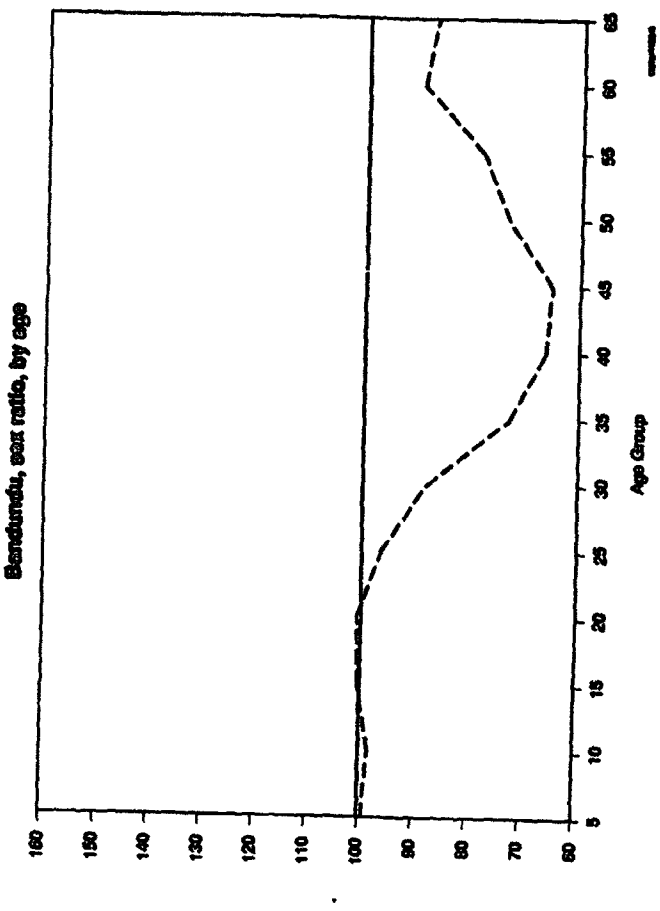


Figure I.2f
Kauai-Occidental, sex ratio, by age

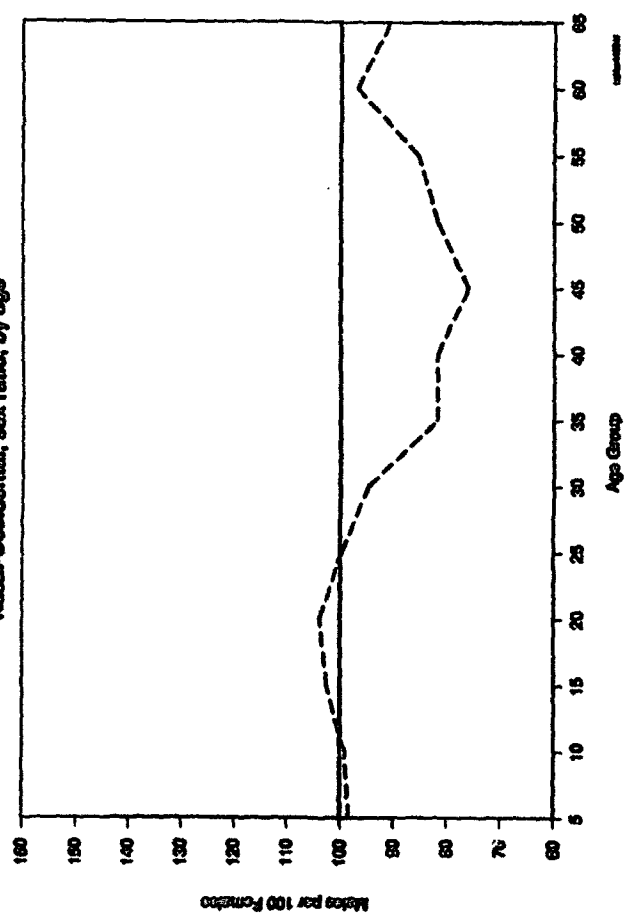
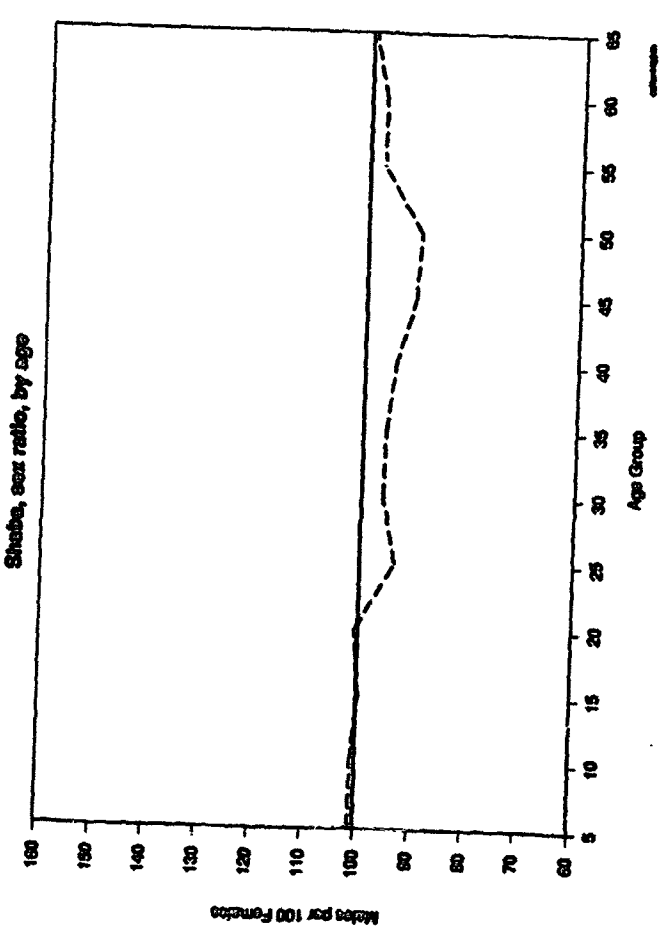


Figure I.2h
Shaba, sex ratio, by age



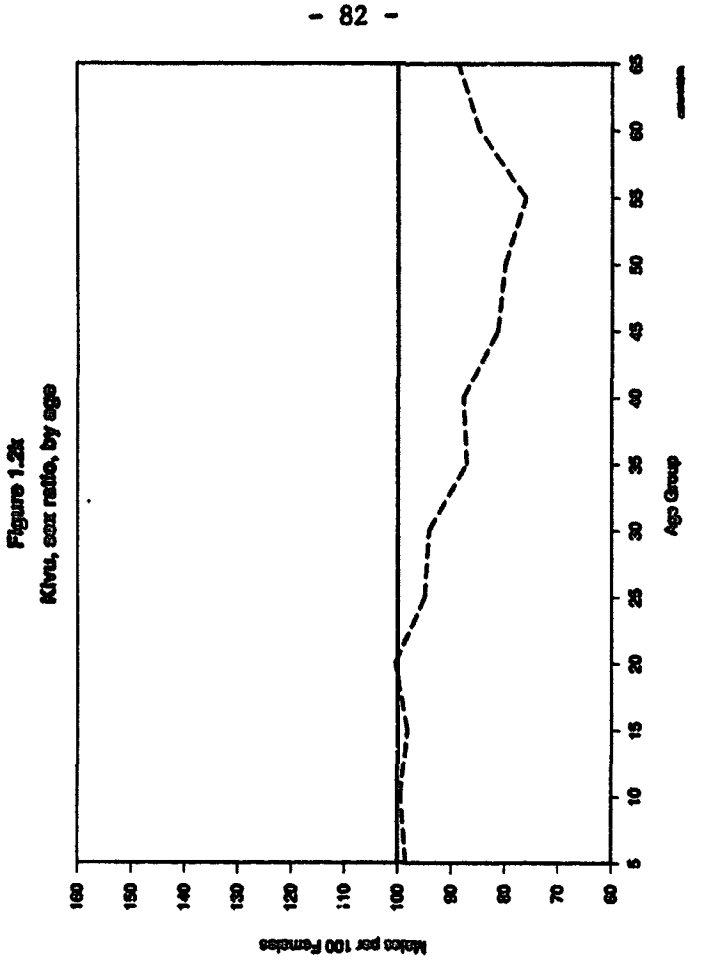


Figure 1.2k
Kivu, sex ratio, by age
Males per 100 Females
160
150
140
130
120
110
100
90
80
70
60
5
10
15
20
25
30
35
40
45
50
55
60
65
Age Group

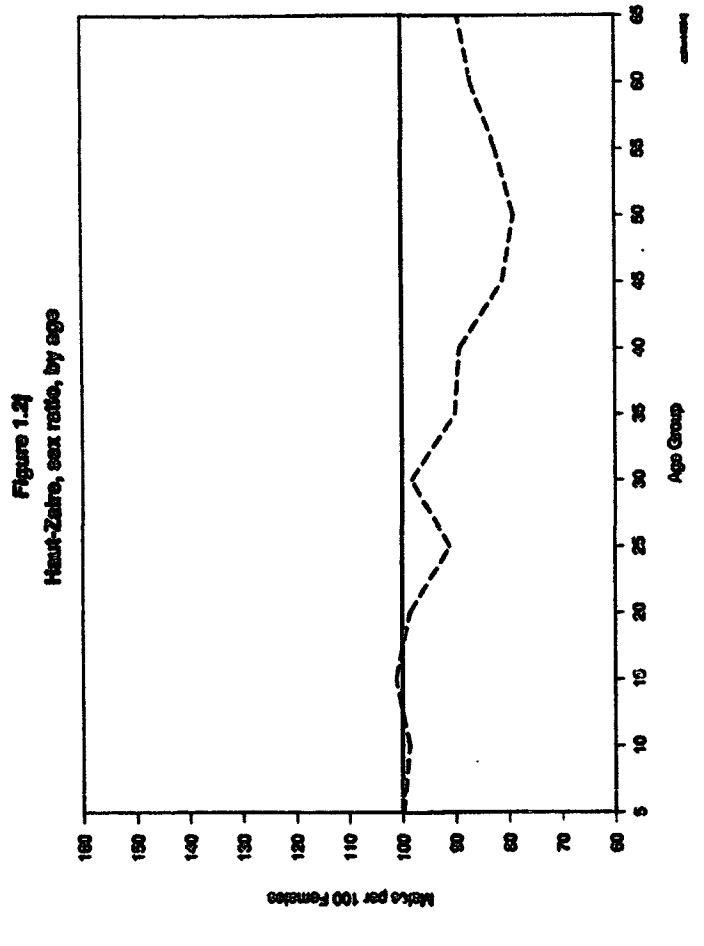
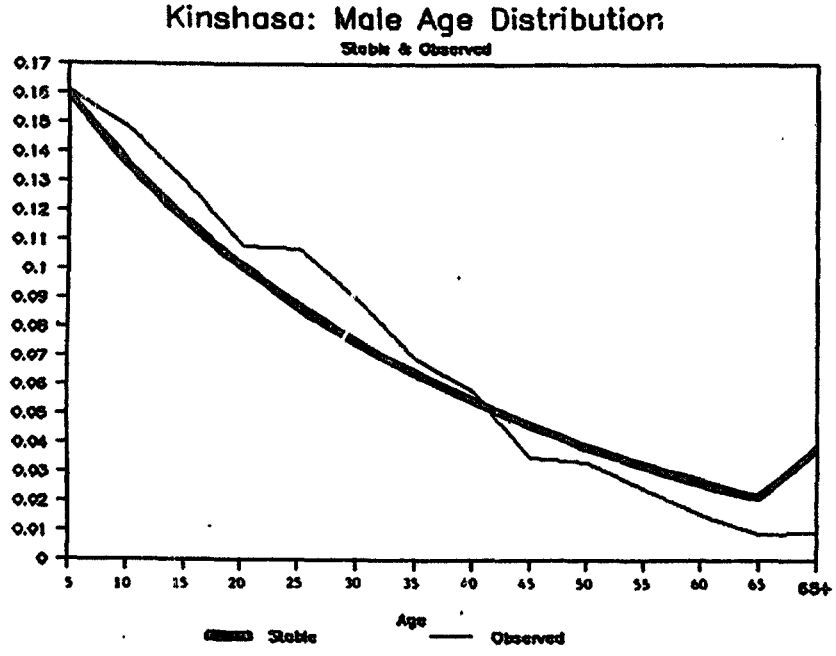
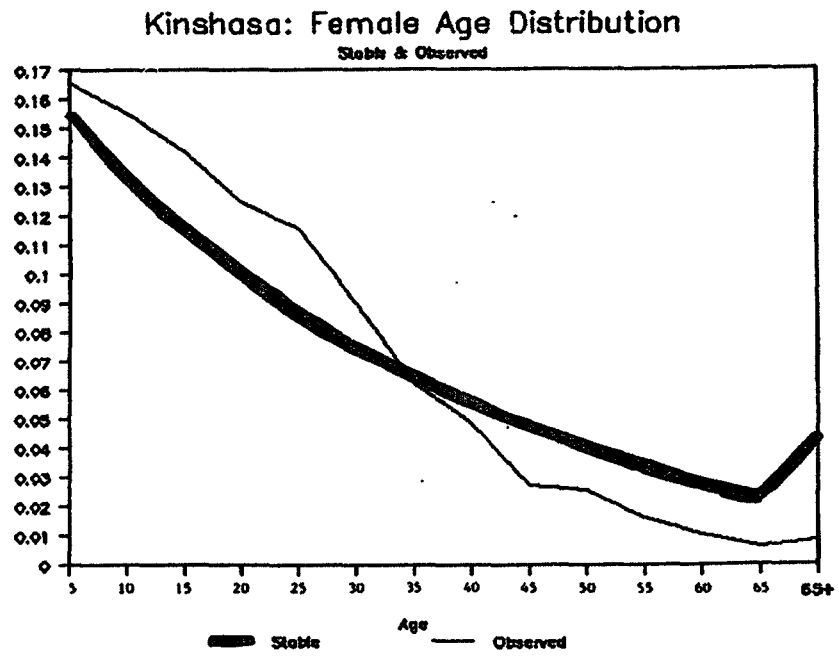
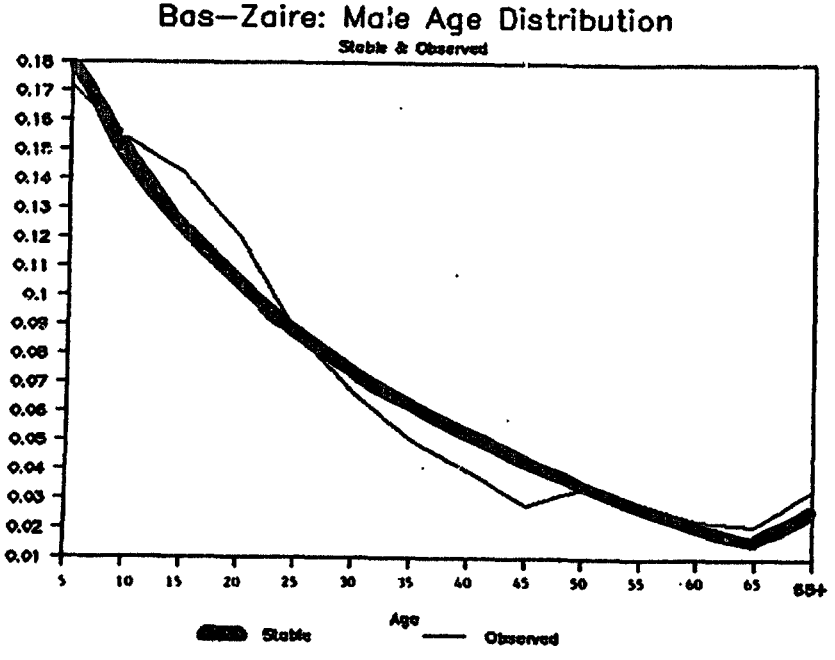


Figure 1.2l
Haut-Zaire, sex ratio, by age
Males per 100 Females
160
150
140
130
120
110
100
90
80
70
60
5
10
15
20
25
30
35
40
45
50
55
60
65
Age Group

Figure I.3a


Kinshasa: Male Age Distribution
Stable & Observed
Age
Stable
Observed


Kinshasa: Female Age Distribution
Stable & Observed
Age
Stable
Observed


Bas-Zaire: Male Age Distribution
Stable & Observed
Age
Stable
Observed

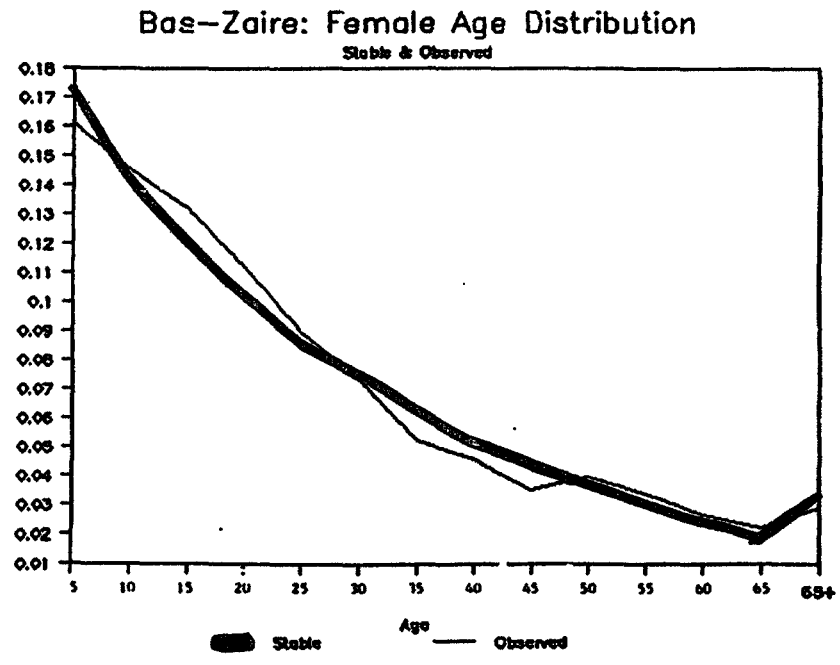
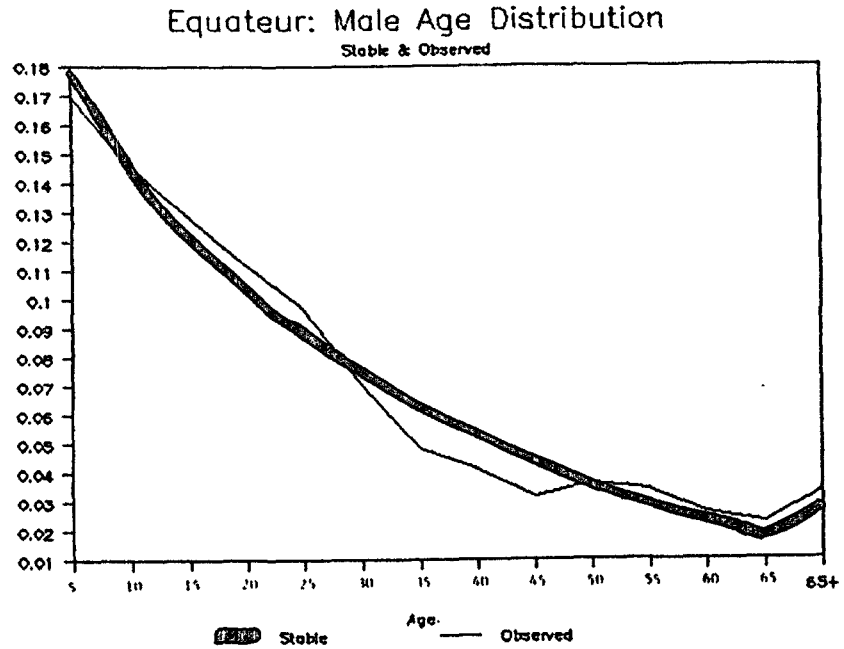
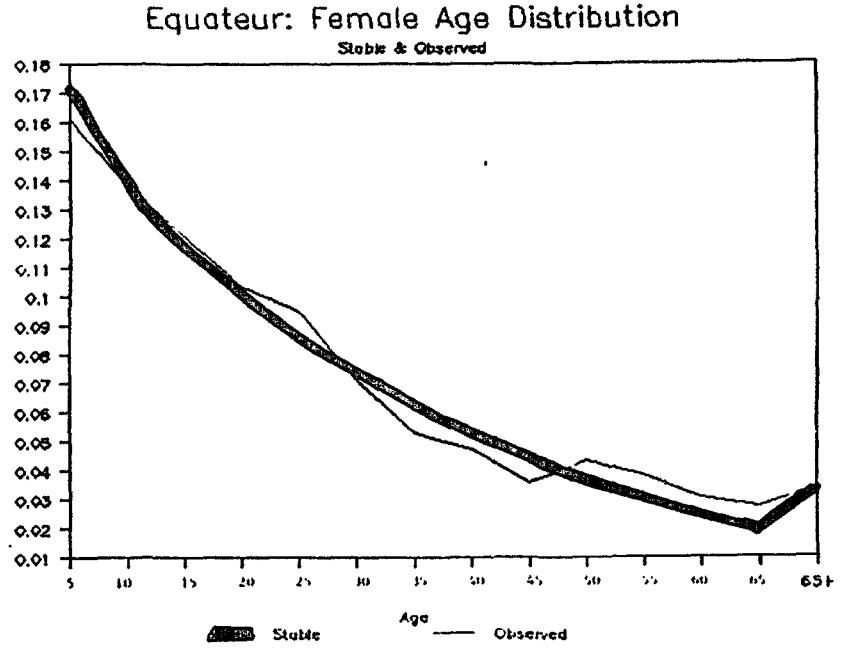
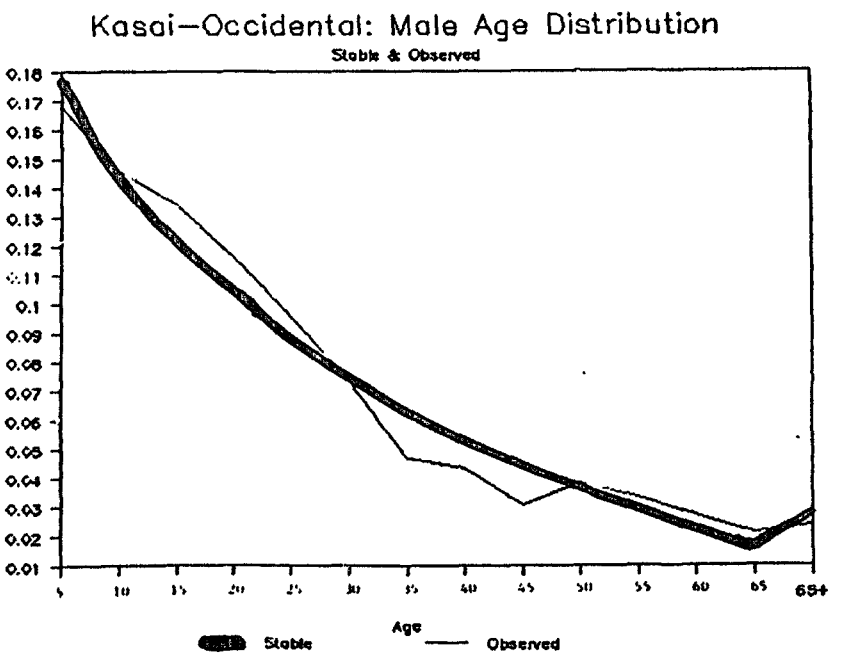

Bas-Zaire: Female Age Distribution
Stable & Observed
Age
Stable
Observed

Figure I.3b


Equateur: Male Age Distribution
Stable & Observed
Stable
Observed
Age


Equateur: Female Age Distribution
Stable & Observed
Stable
Observed
Age


Kasai—Occidental: Male Age Distribution
Stable & Observed
Stable
Observed
Age

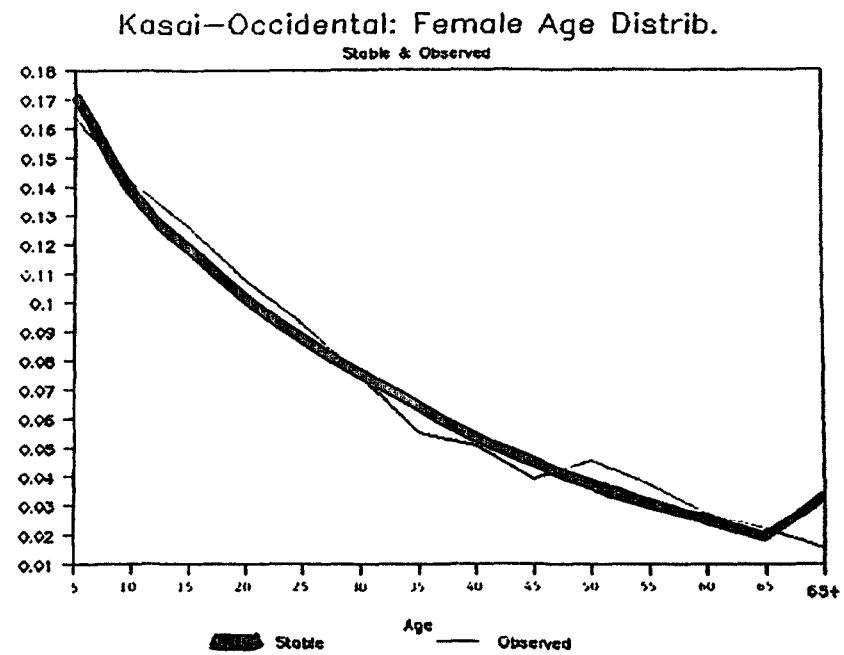
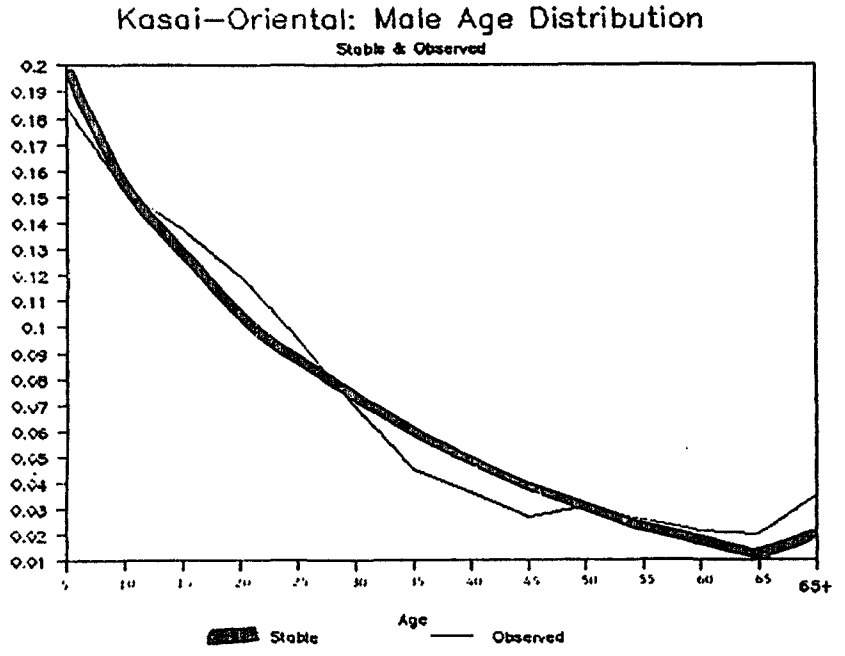
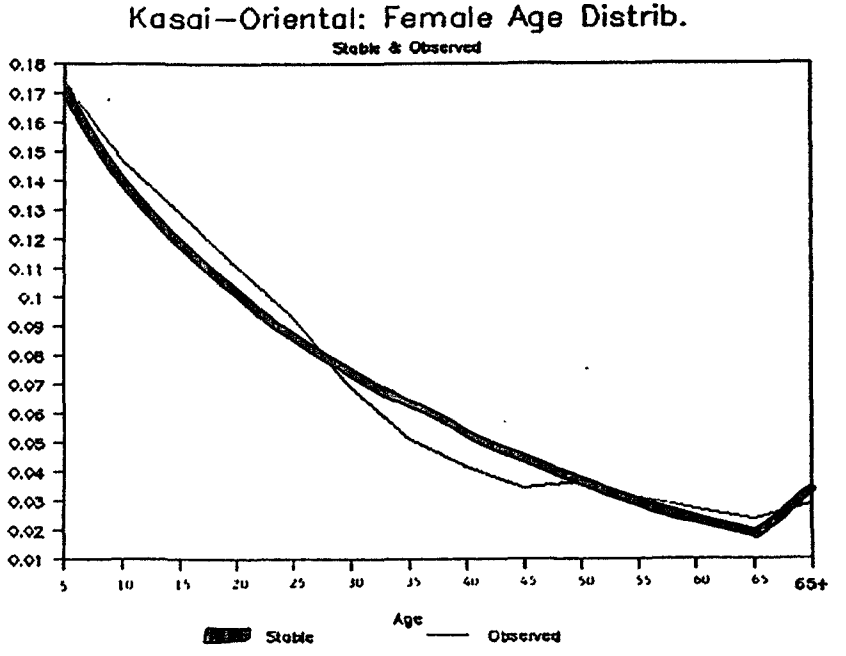
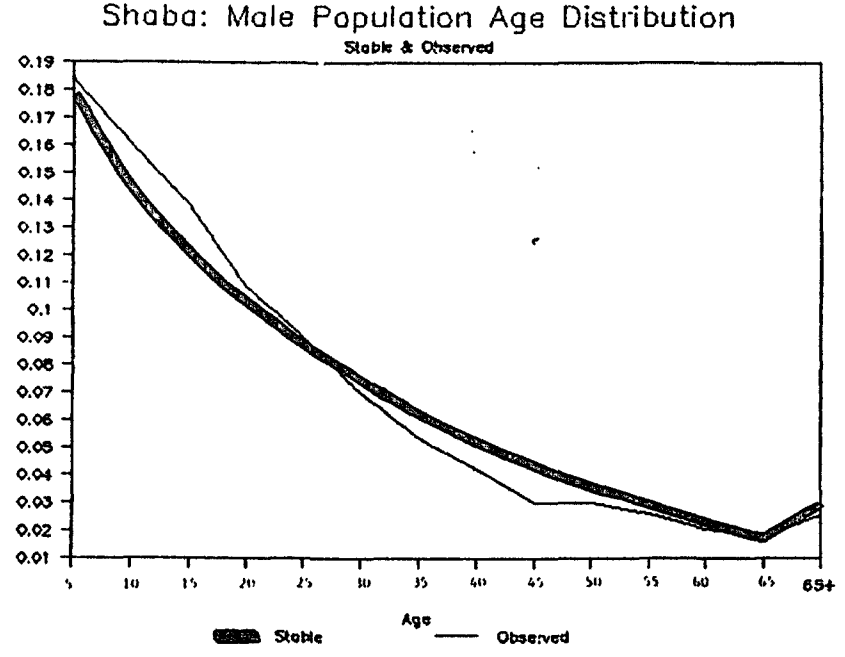

Kasai—Occidental: Female Age Distrib.
Stable & Observed
Stable
Observed
Age

Figure I.3c


Kasai–Oriental: Male Age Distribution
Stable & Observed
Age
Stable
Observed


Kasai–Oriental: Female Age Distrib.
Stable & Observed
Age
Stable
Observed


Shaba: Male Population Age Distribution
Stable & Observed
Age
Stable
Observed

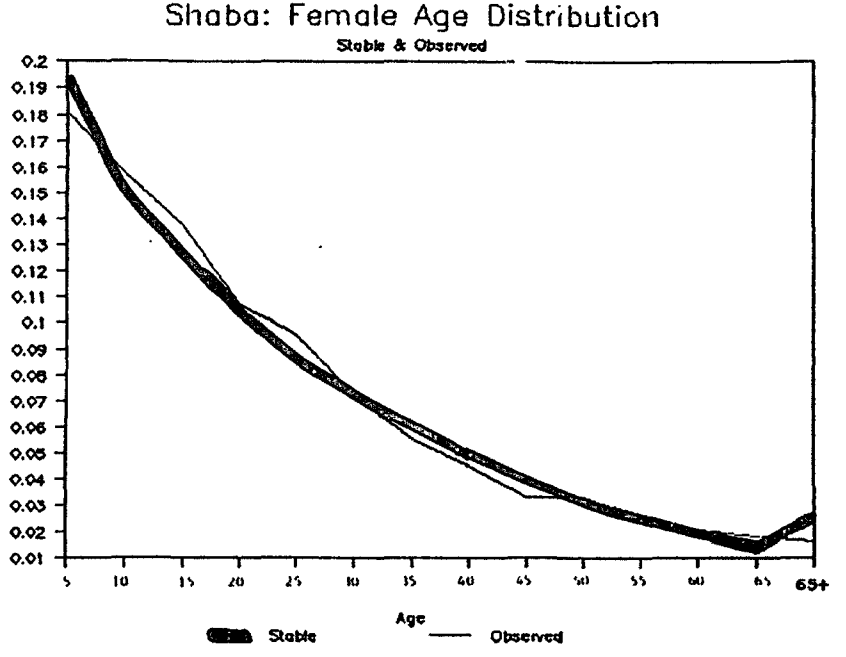
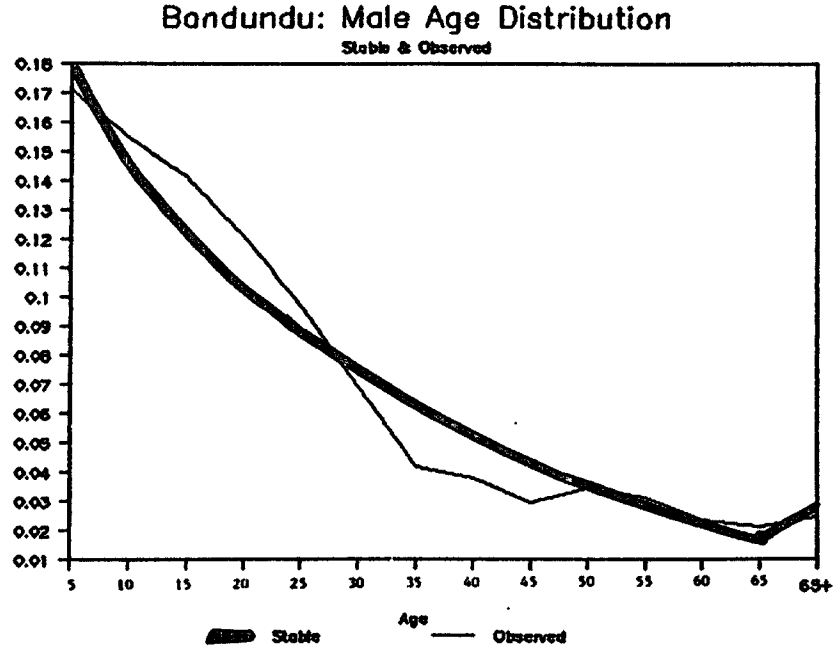
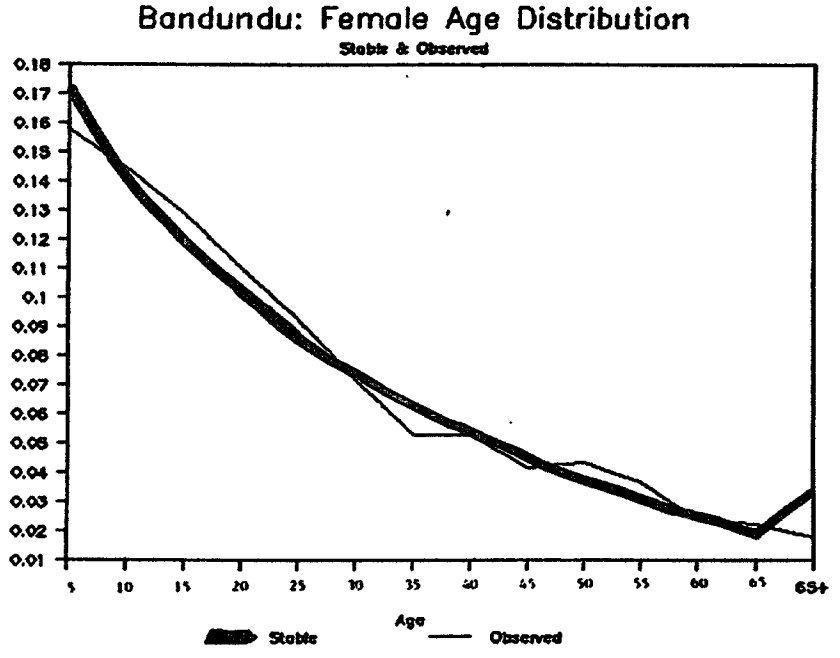
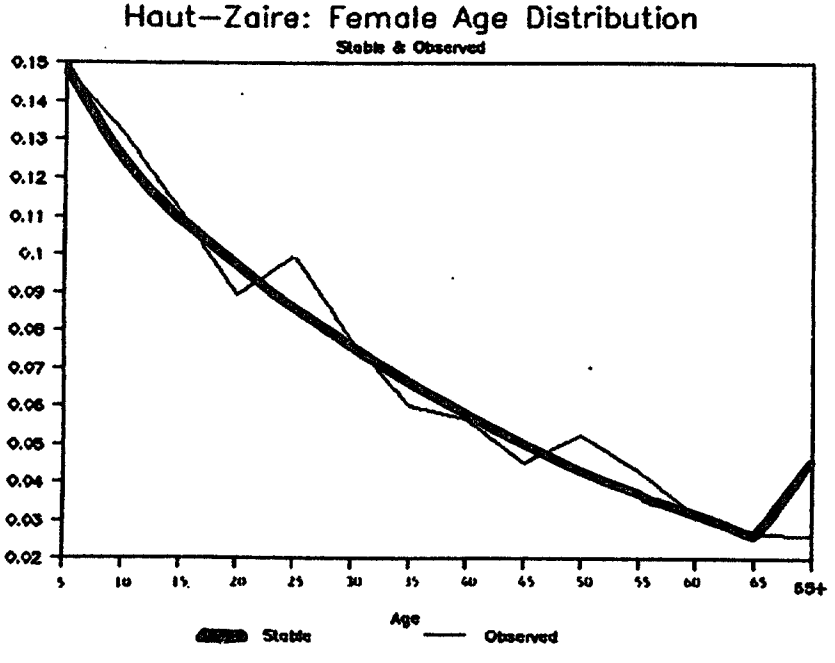

Shaba: Female Age Distribution
Stable & Observed
Age
Stable
Observed

Figure I.3d


Bandundu: Male Age Distribution
Stable & Observed
Age
Stable
Observed


Bandundu: Female Age Distribution
Stable & Observed
Age
Stable
Observed


Haut-Zaire: Female Age Distribution
Stable & Observed
Age
Stable
Observed

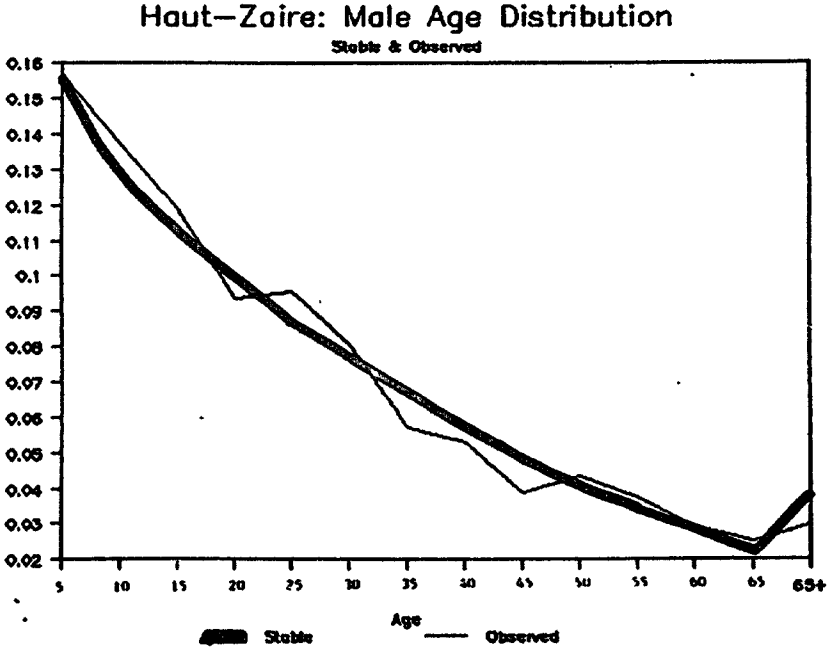
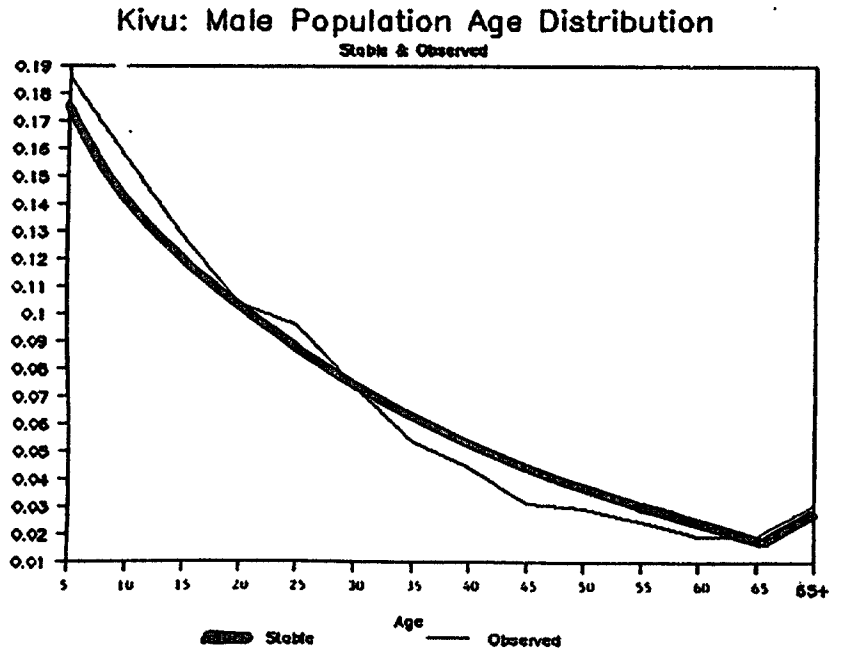
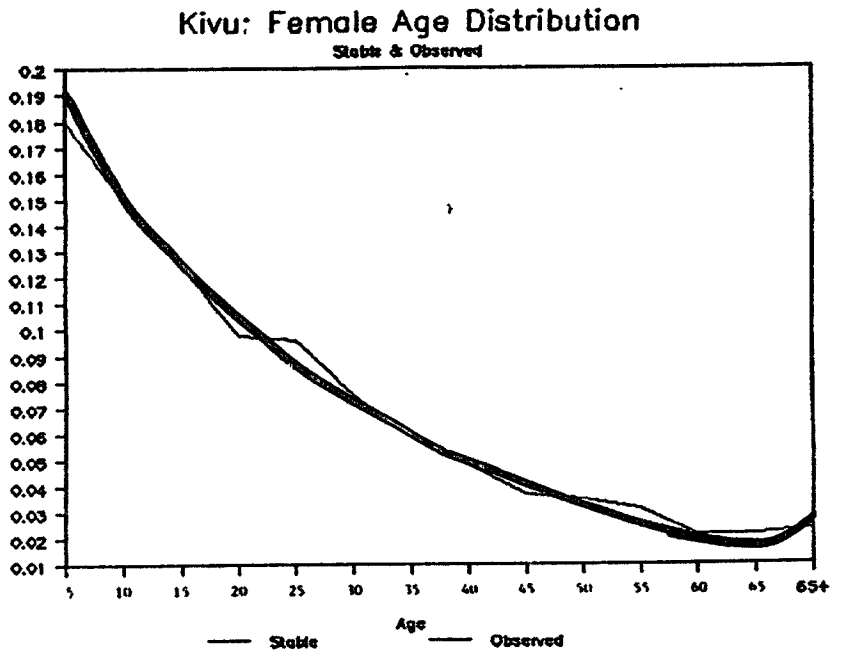
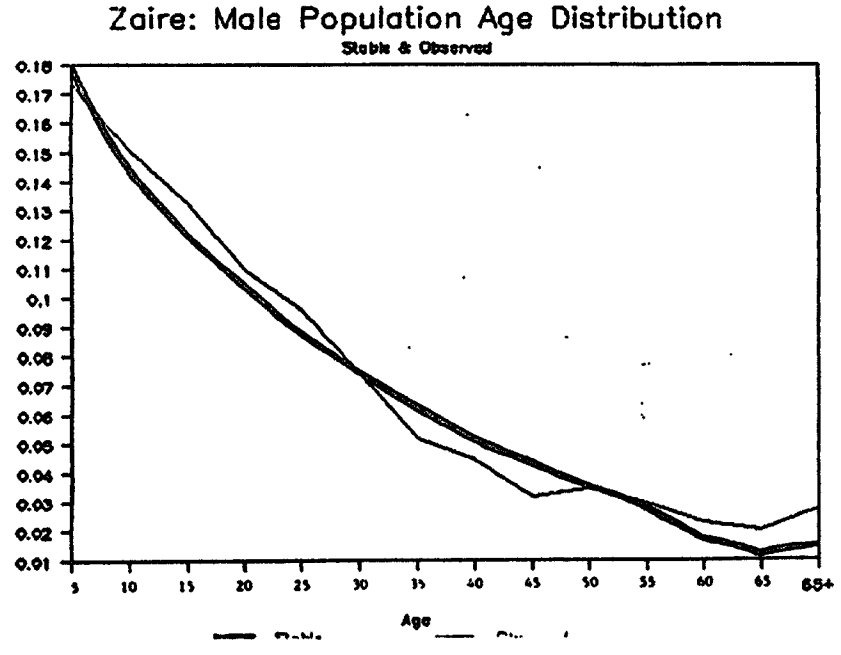

Haut-Zaire: Male Age Distribution
Stable & Observed
Age
Stable
Observed

Figure I.3e


Kivu: Male Population Age Distribution
Stable & Observed
Age
Stable
Observed


Kivu: Female Age Distribution
Stable & Observed
Age
Stable
Observed


Zaire: Male Population Age Distribution
Stable & Observed
Age

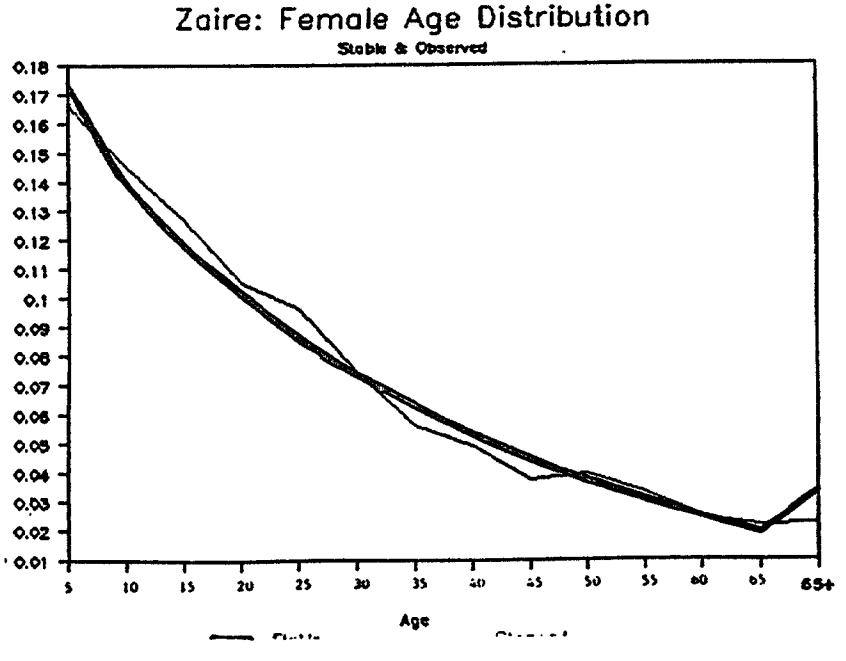

Zaire: Female Age Distribution
Stable & Observed
Age

Figure I.4a
Zaire: Estimated Birth Rate,

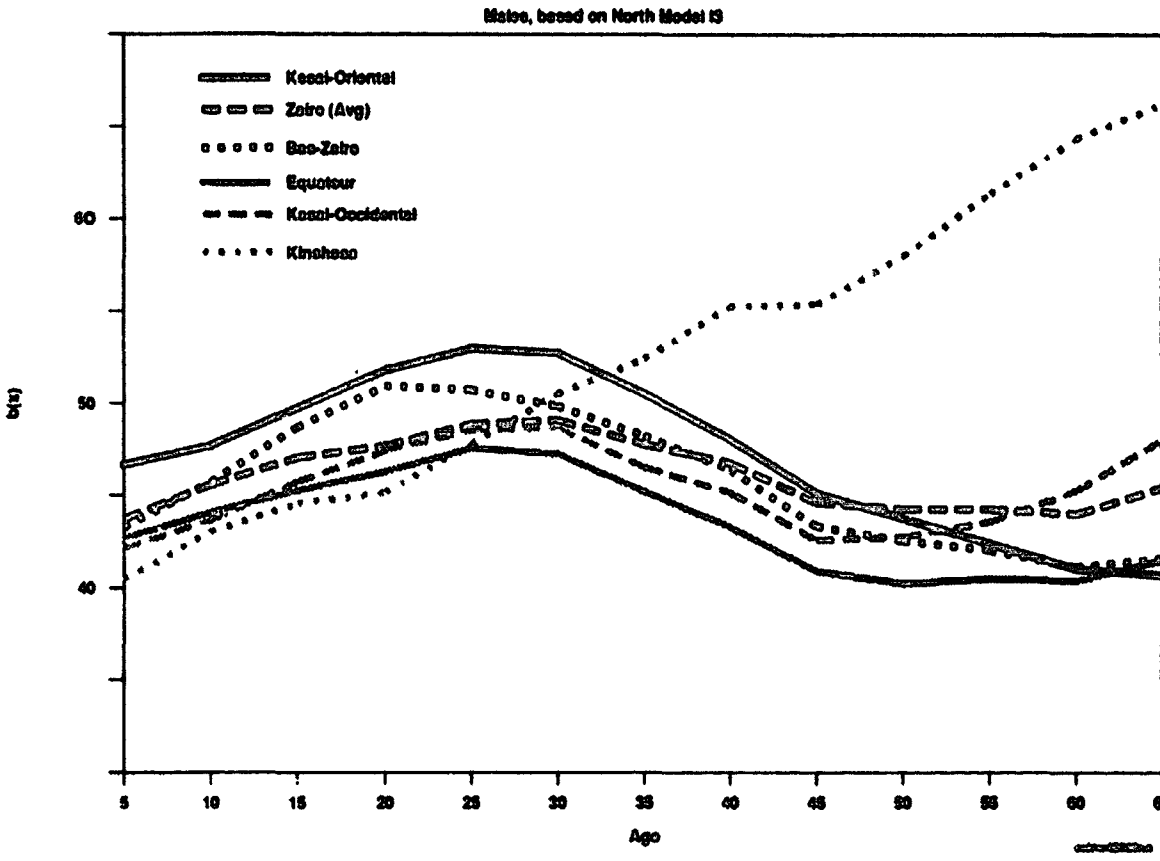


Figure I.4b
Zaire: Estimated Birth Rate,

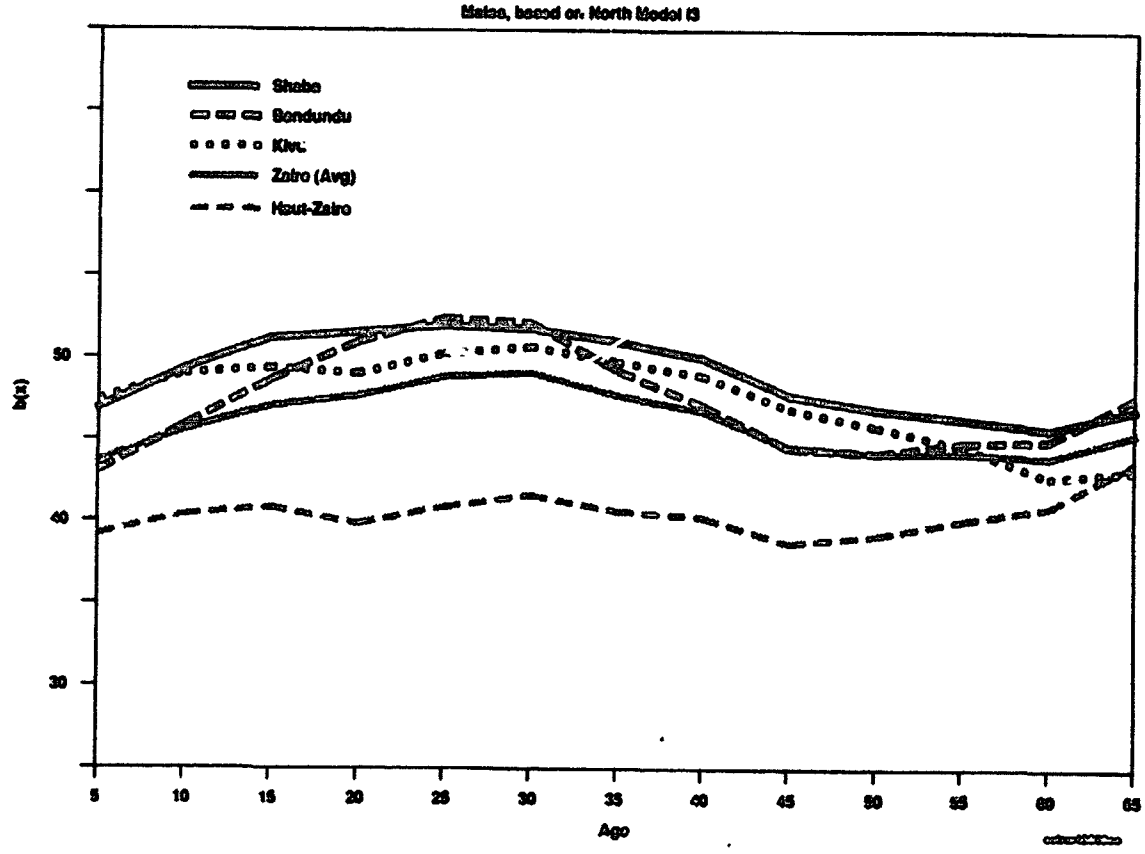


Figure I.4c
Zaire: Estimated Birth Rate,
Females, based on North Model l3

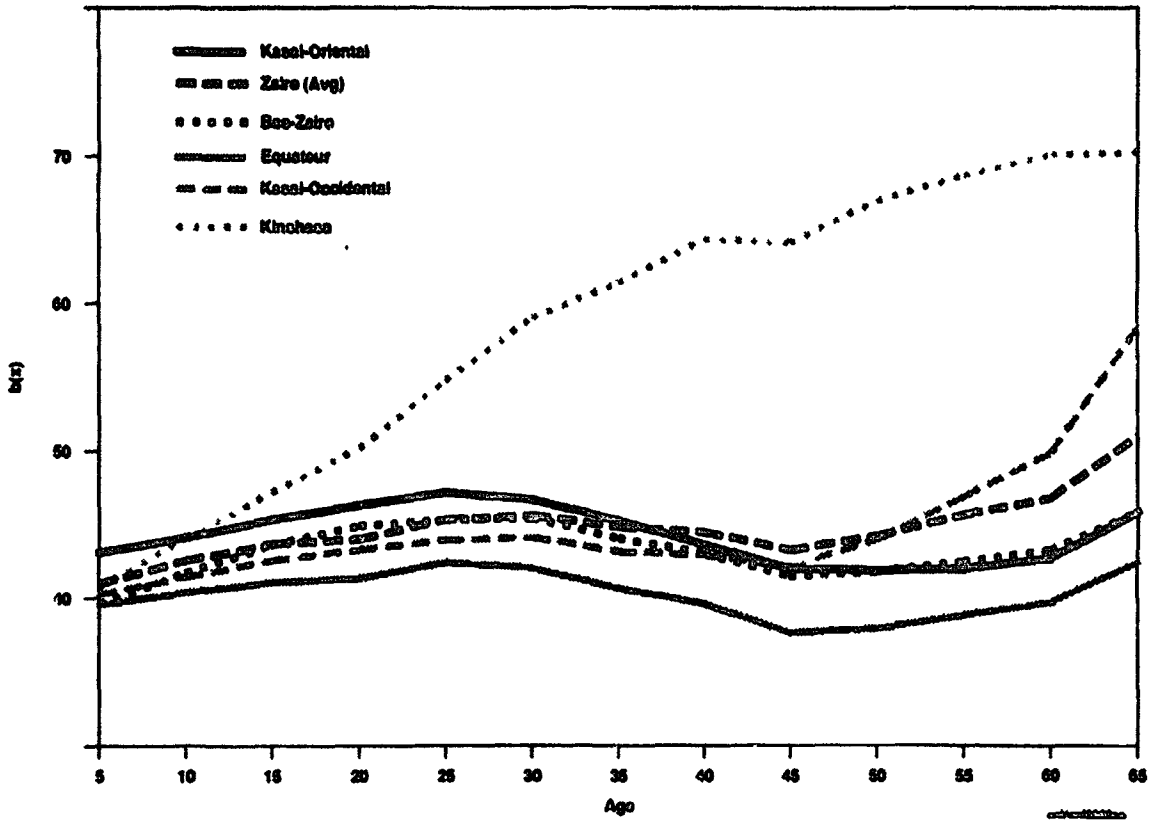


Figure I.4d
Zaire: Estimated Birth Rate,
Females, based on North Model l3

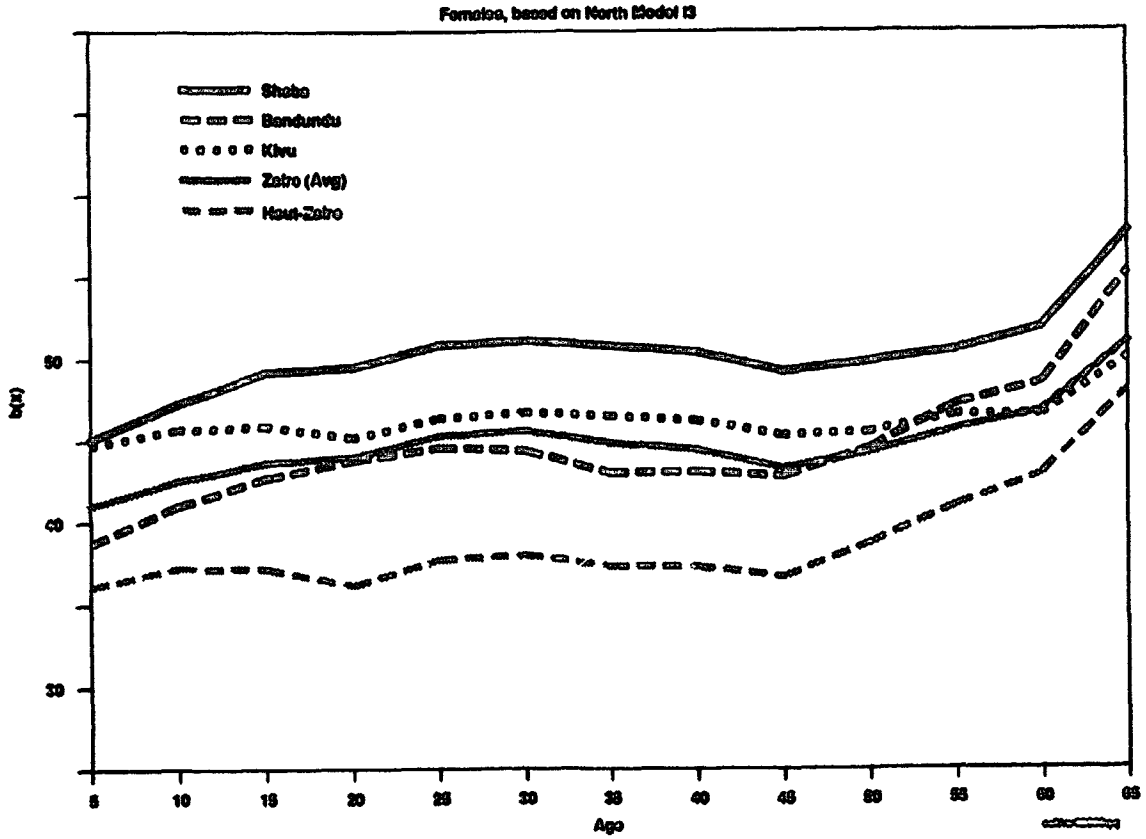


Figure II.1a
Zaire: Average Parities, by Region
1984 Census

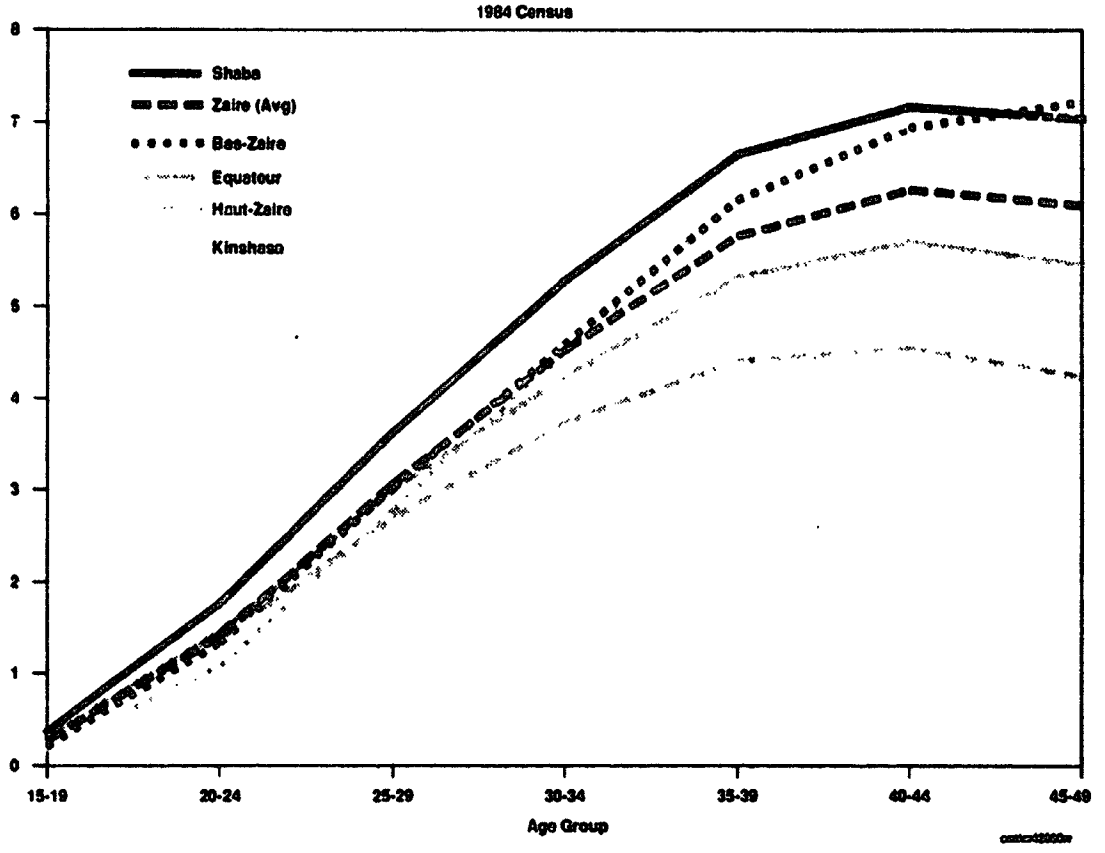


Figure II.1b
Zaire: Average Parities, by Region
1984 Census

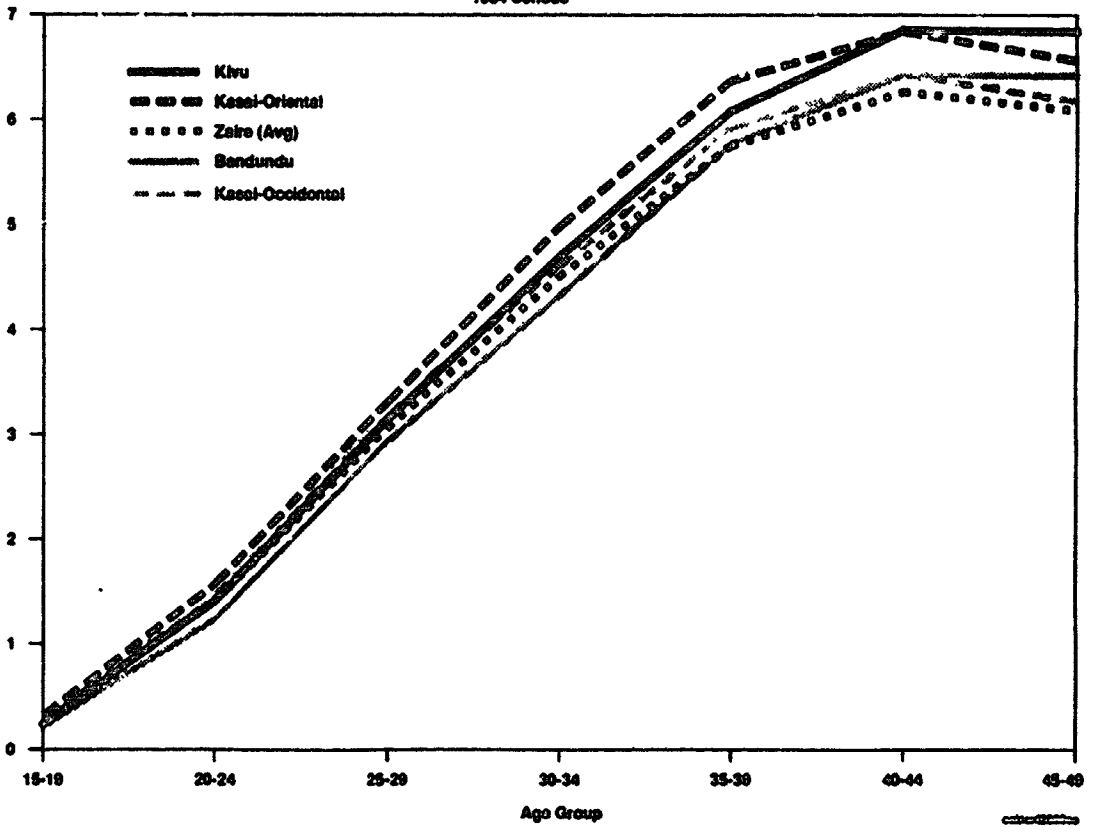


Figure II.1c
Kinshasa: Average Parities

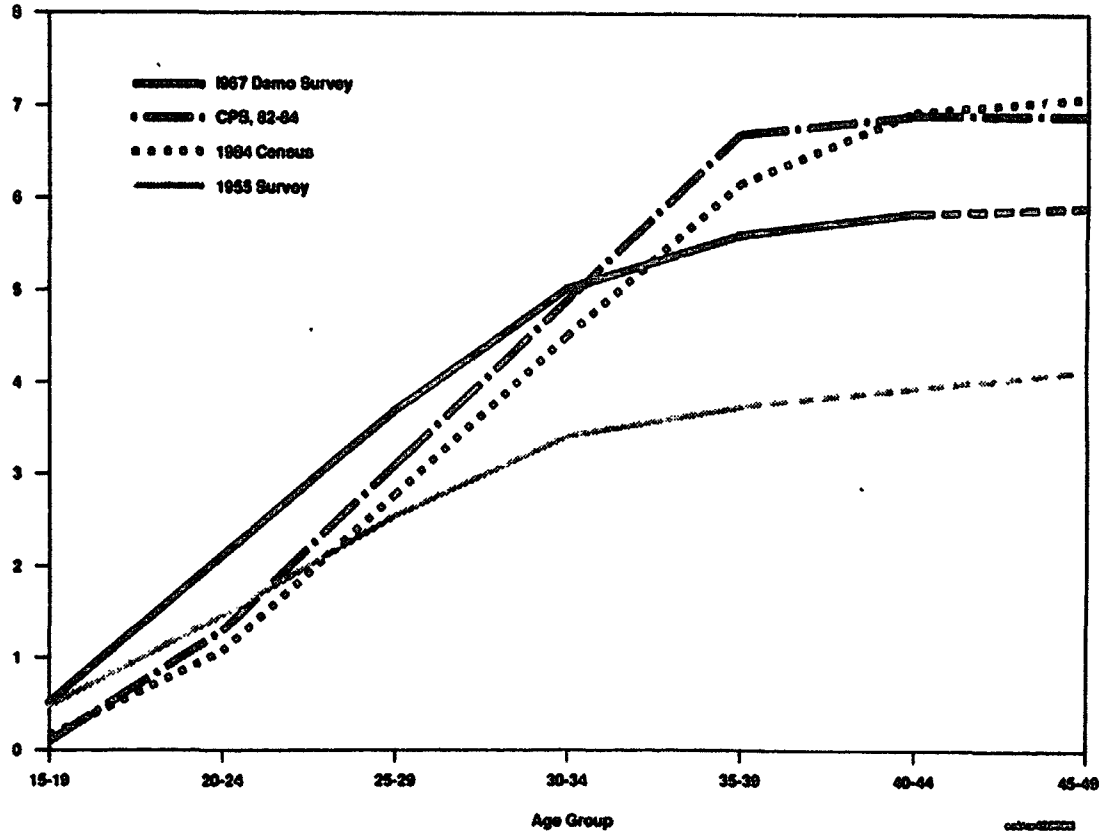


Figure II.2a
Zaire: Average Parities, by region

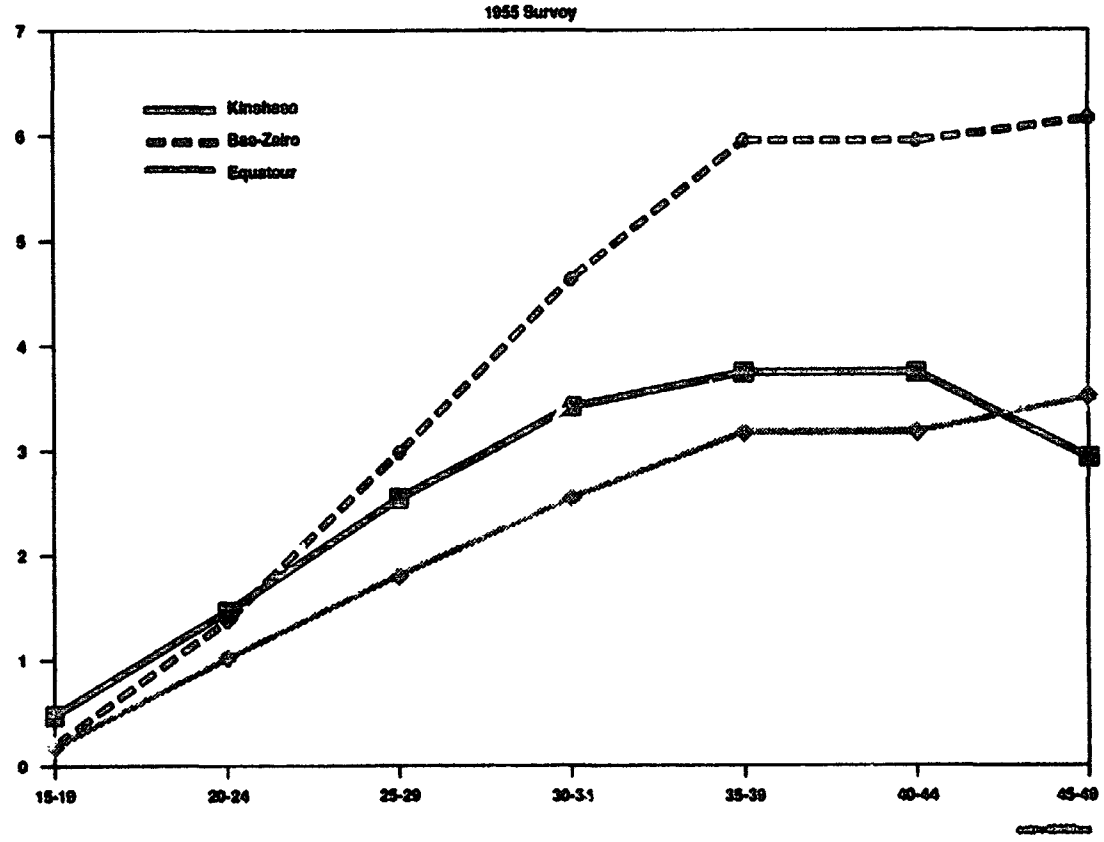


Figure II.2b
Zaire: Average parities, by region
1955 Survey

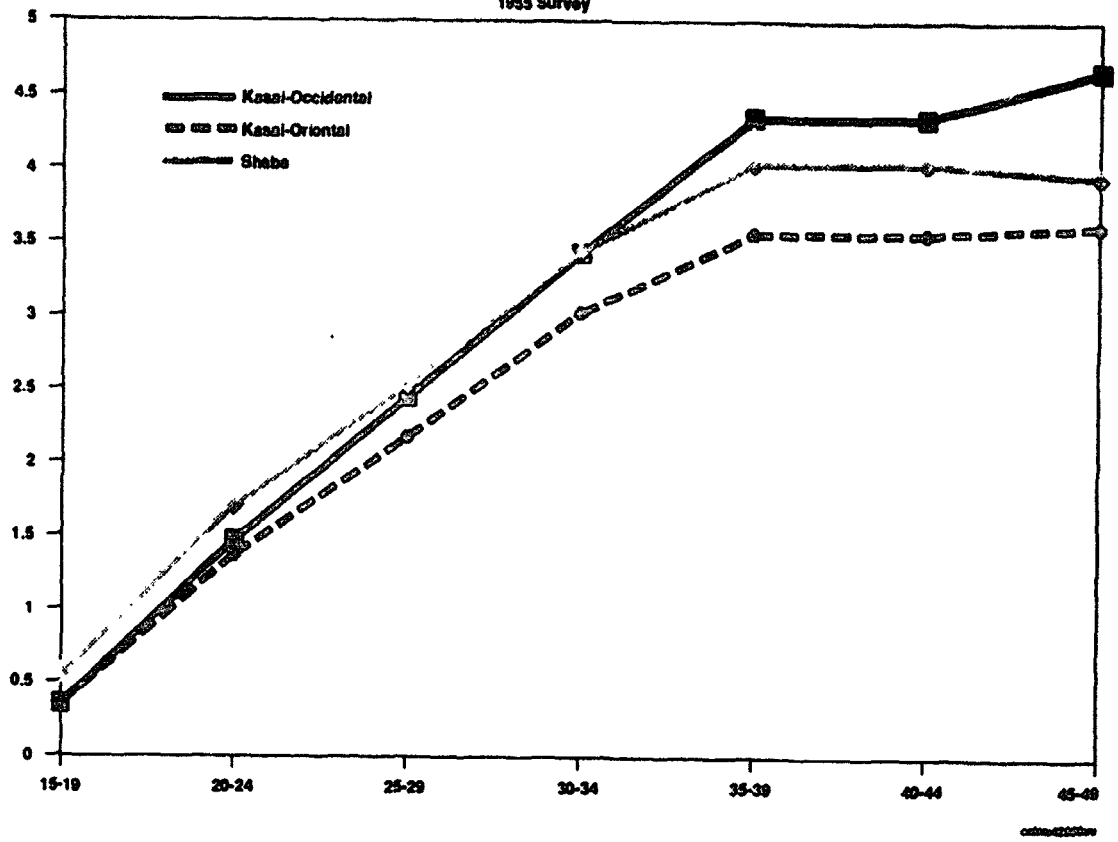


Figure II.2c
Zaire: Average Parities, by region
1955 Survey

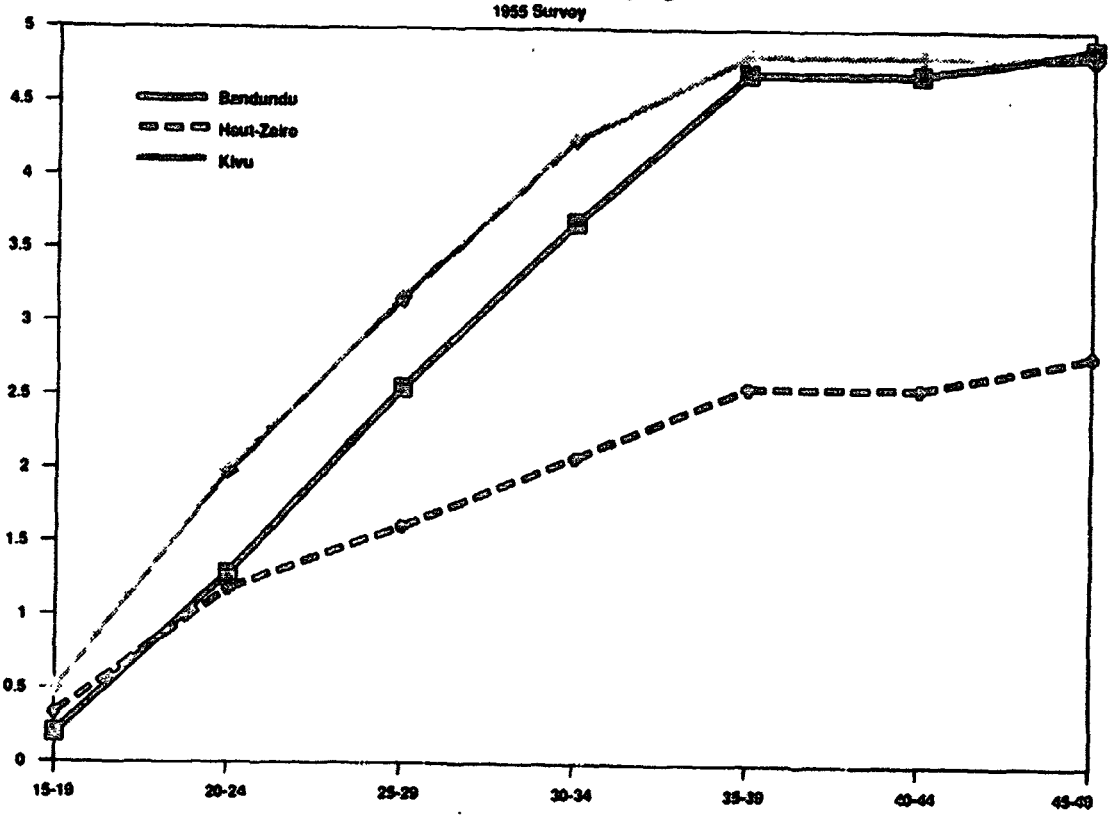


Figure II.3a
Proportion of Children Dead,
by age of mother, 1984 Census

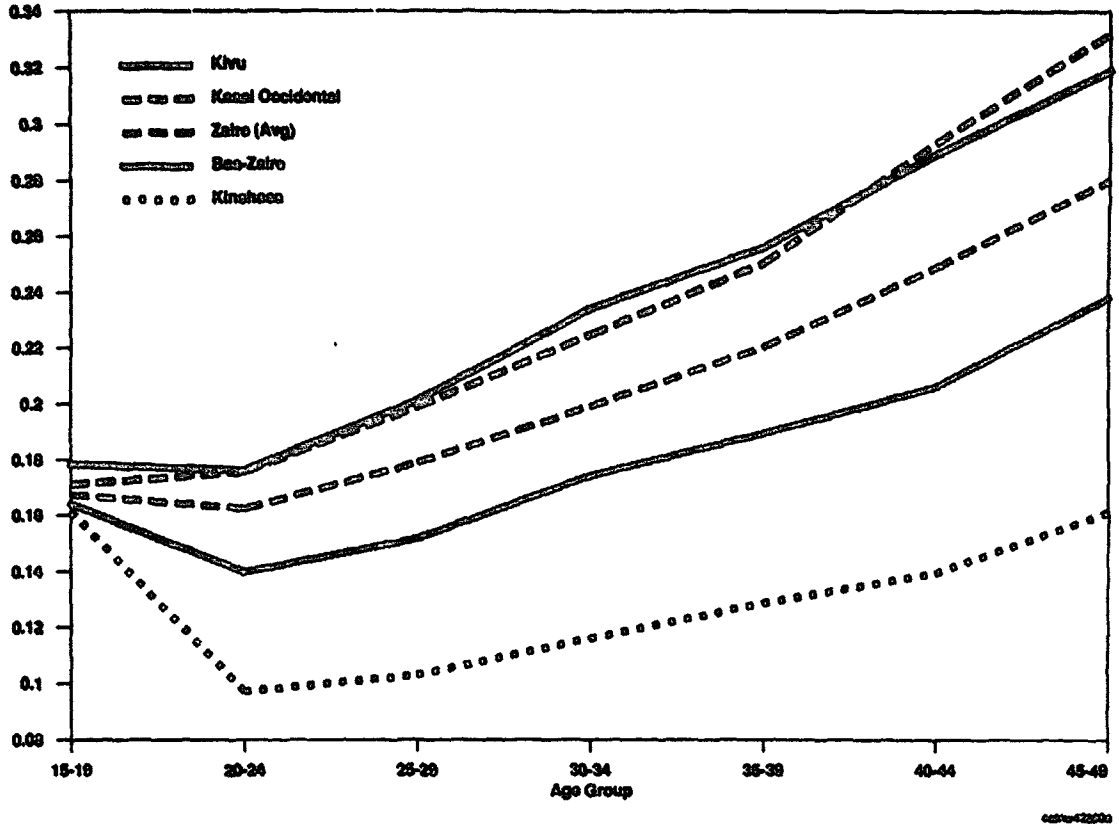


Figure II.3b
Proportion of Children Dead,
by age of mother, 1984 Census

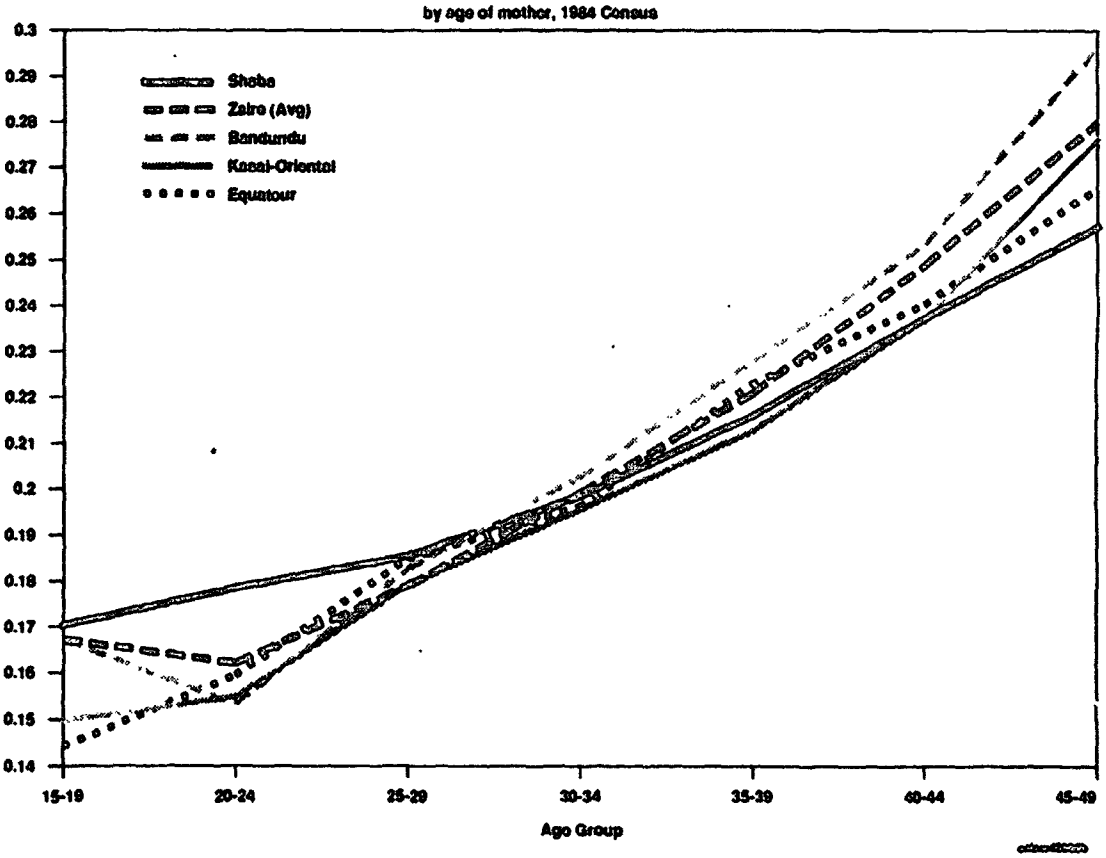


Figure II.4a
Zaire: Proportion of Children Dead,
by age of mother, 1955 Survey

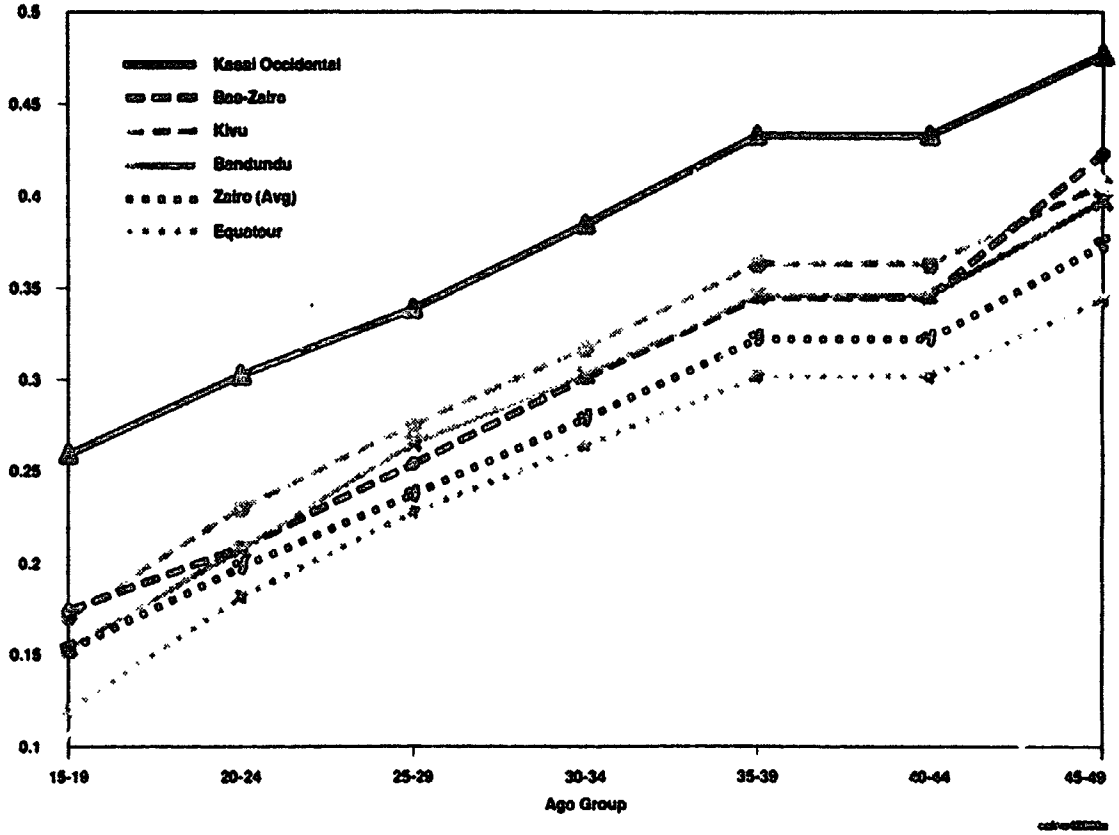


Figure II.4b
Zaire: Proportion of Children Dead,
by age of mother, 1955 Survey

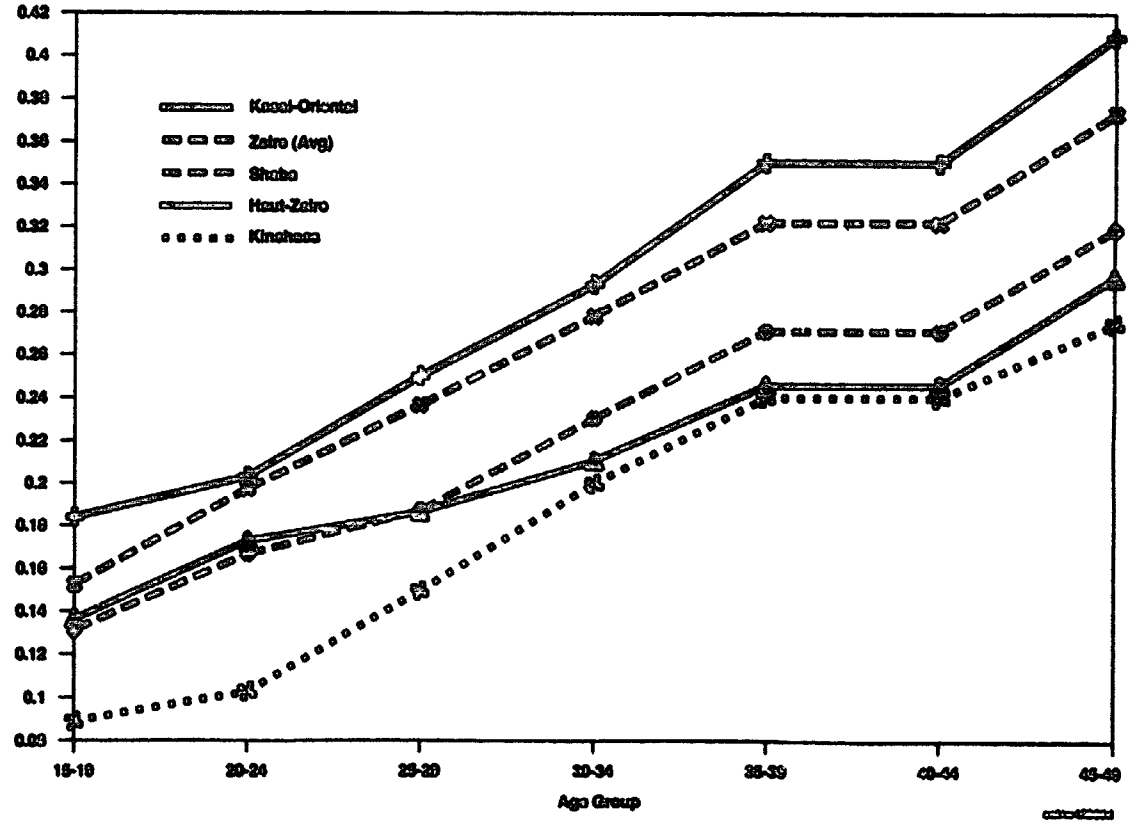


Figure II.5a
Kinshasa & Bas-Zaire: Trends in Child Survival
1955 Survey, 1967 Survey and 1984 Census

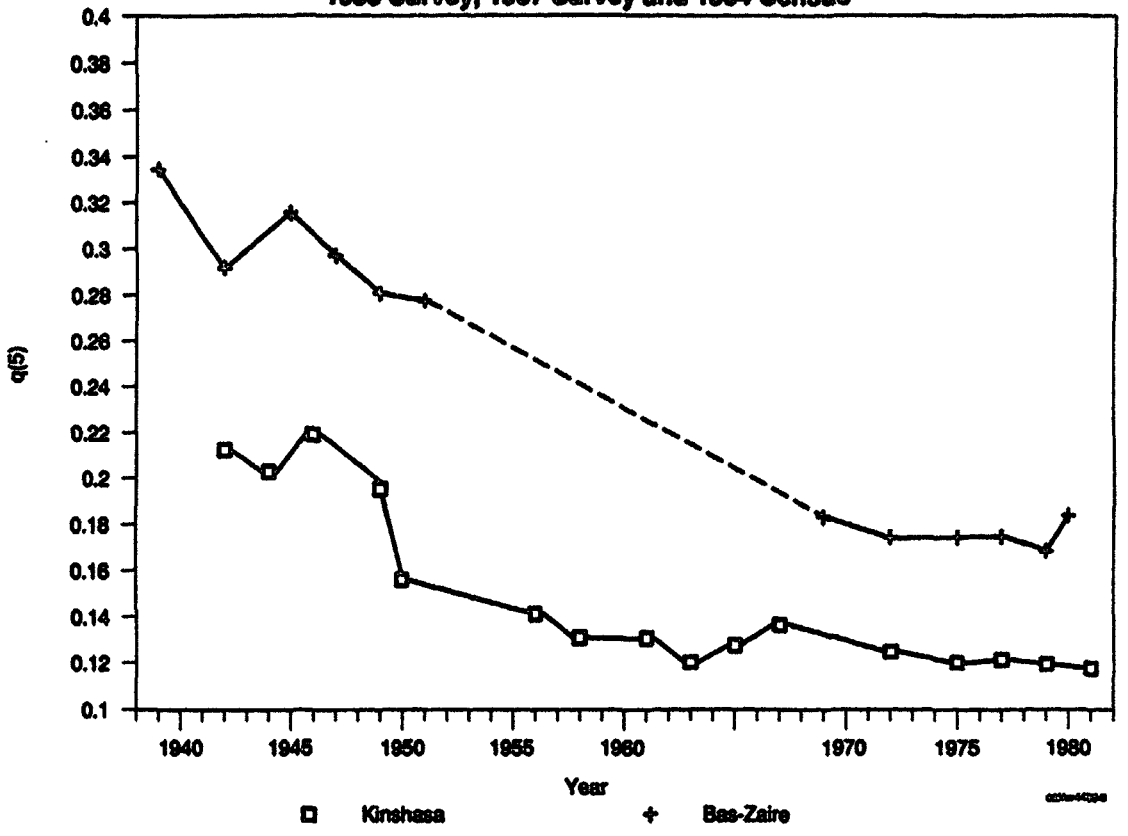


Figure II.5b
Equateur: Trends in Child Survival
1955 Survey and 1984 Census

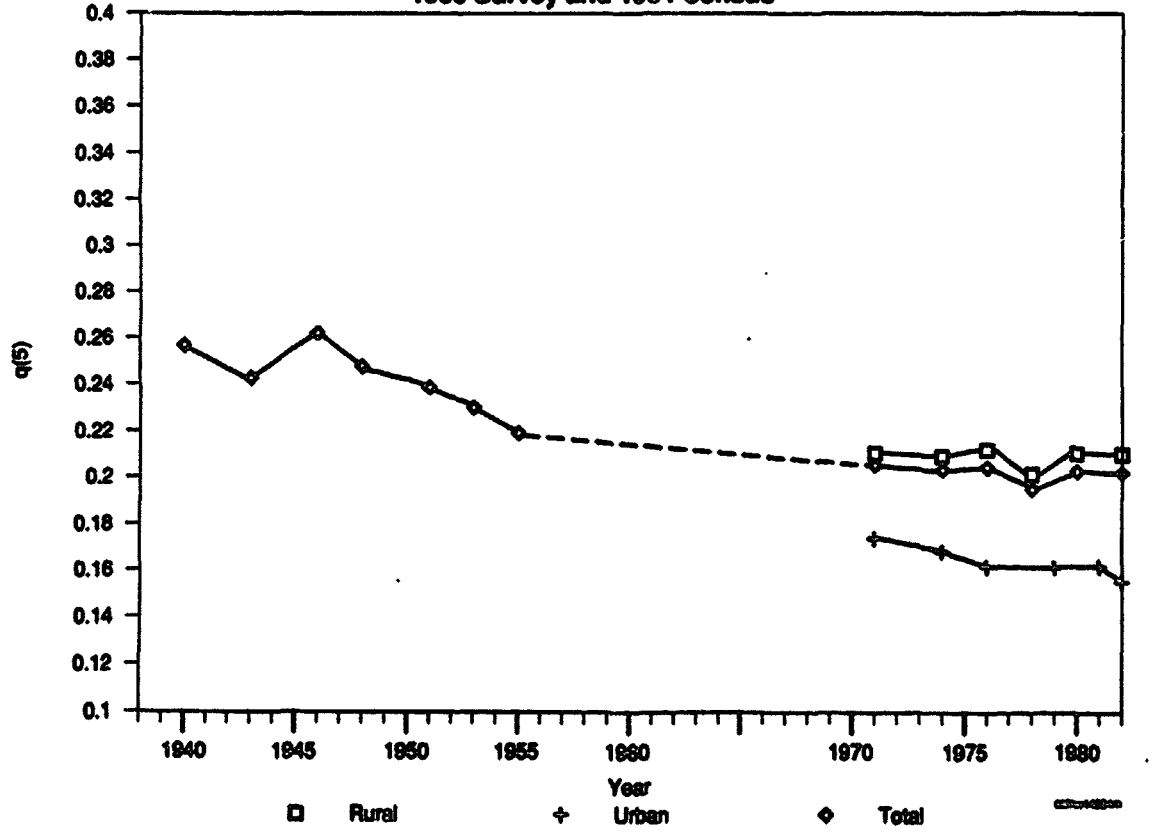


Figure II.5c
Kasai Occidental: Trends in Child Survival
1955 Survey and 1984 Census

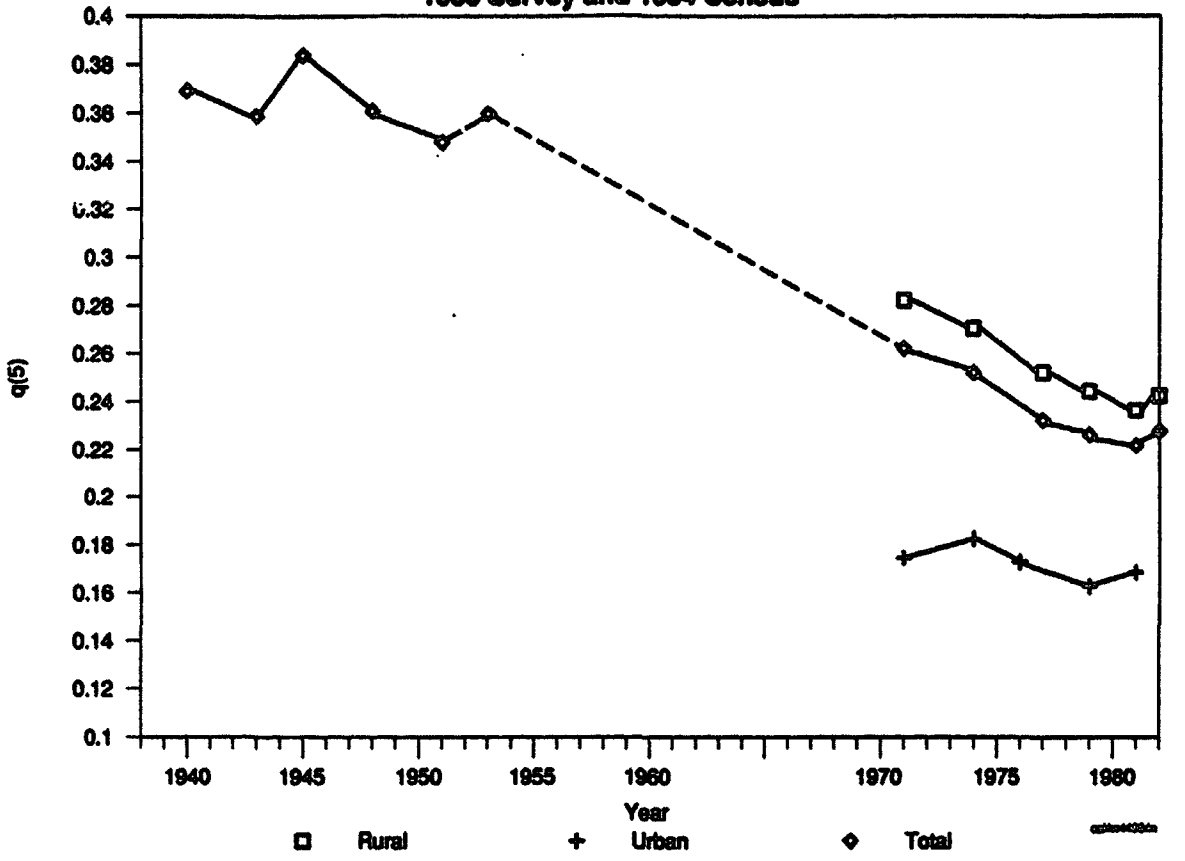


Figure II.5d
Kasai Oriental: Trends in Child Survival
1955 Survey and 1984 Census

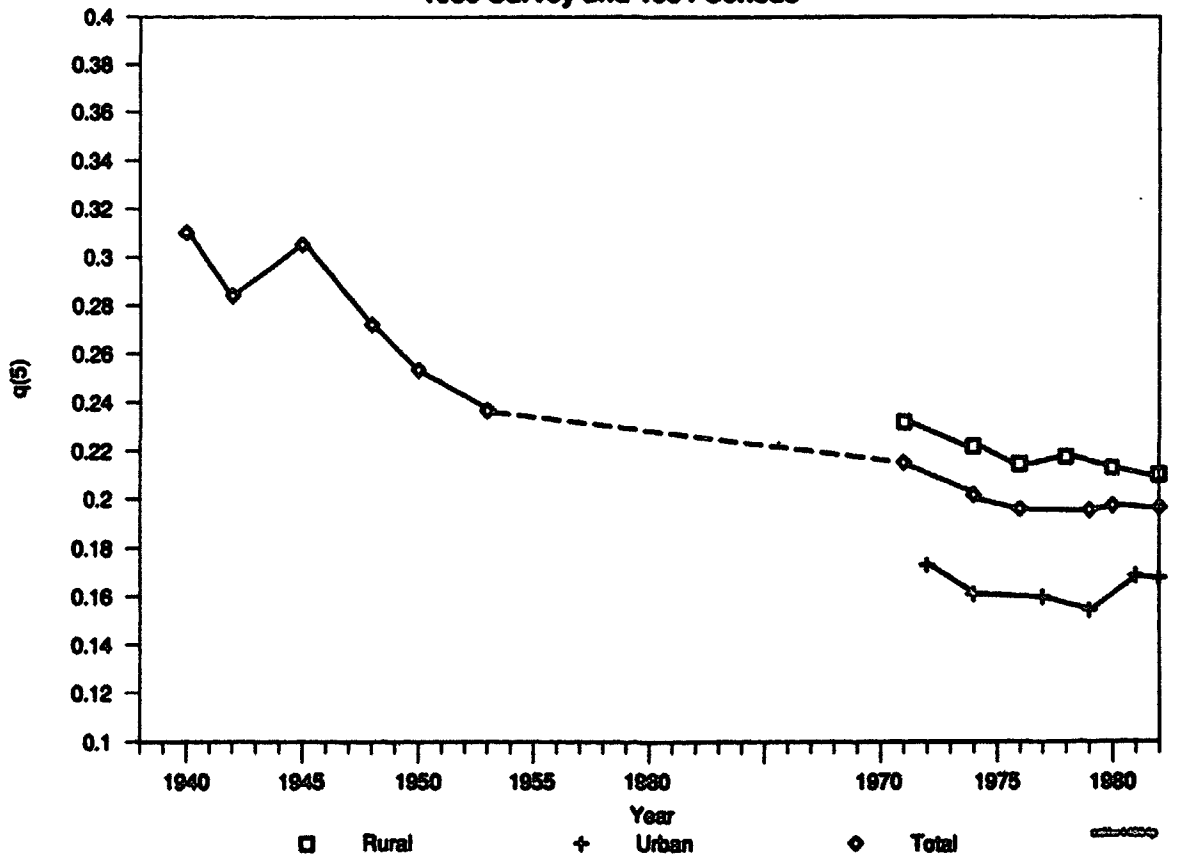


Figure II.5e
Shaba: Trends in Child Survival
1955 Survey and 1984 Census

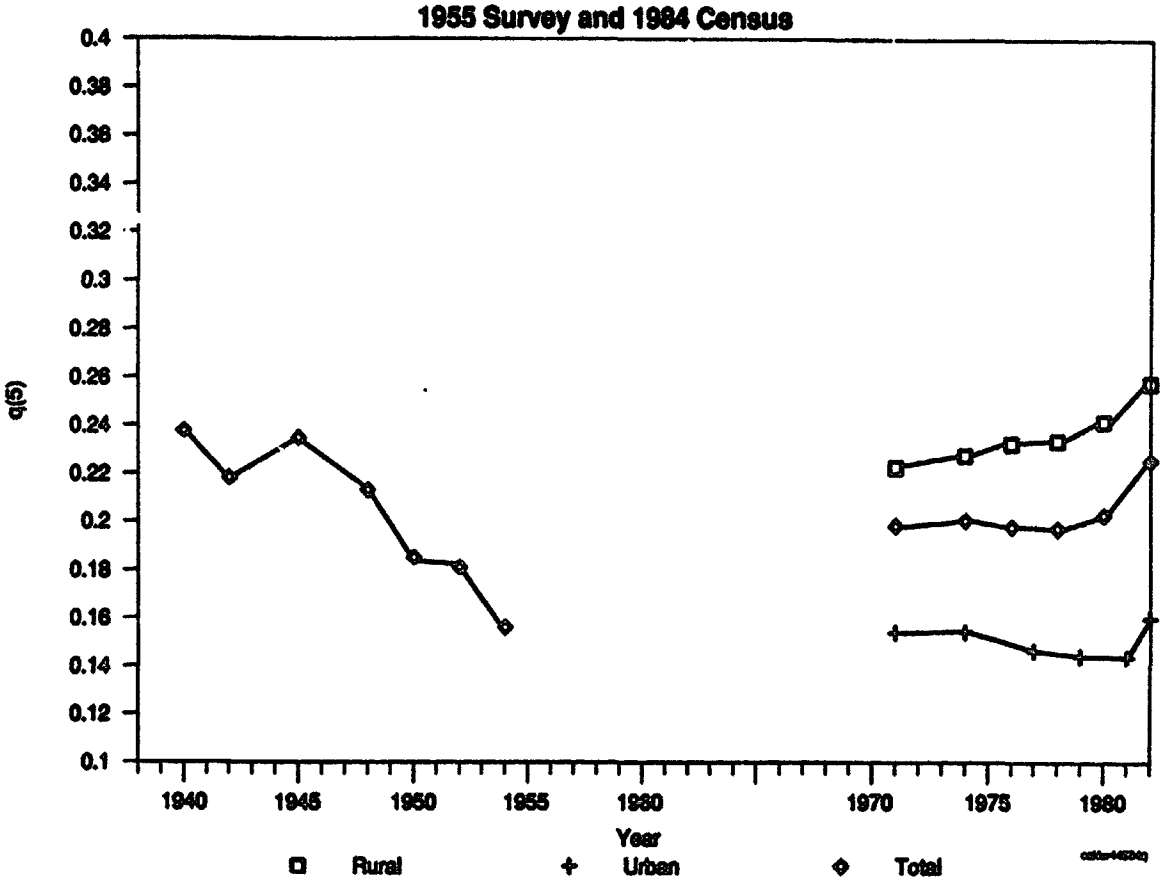


Figure II.5f
Bandundu: Trends in Child Survival
1955 Survey and 1984 Census

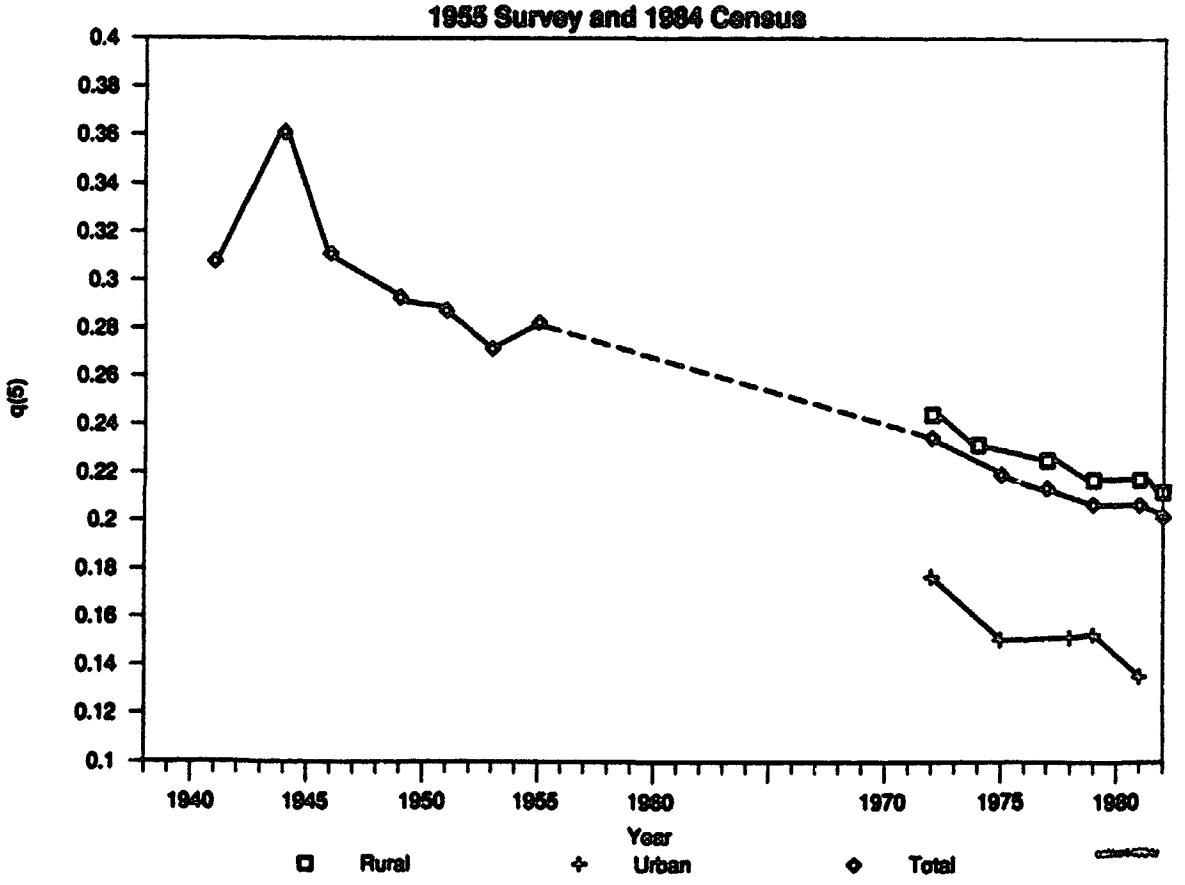


Figure II.5g
Haut-Zaire: Trends in Child Survival
1955 Survey and 1984 Census

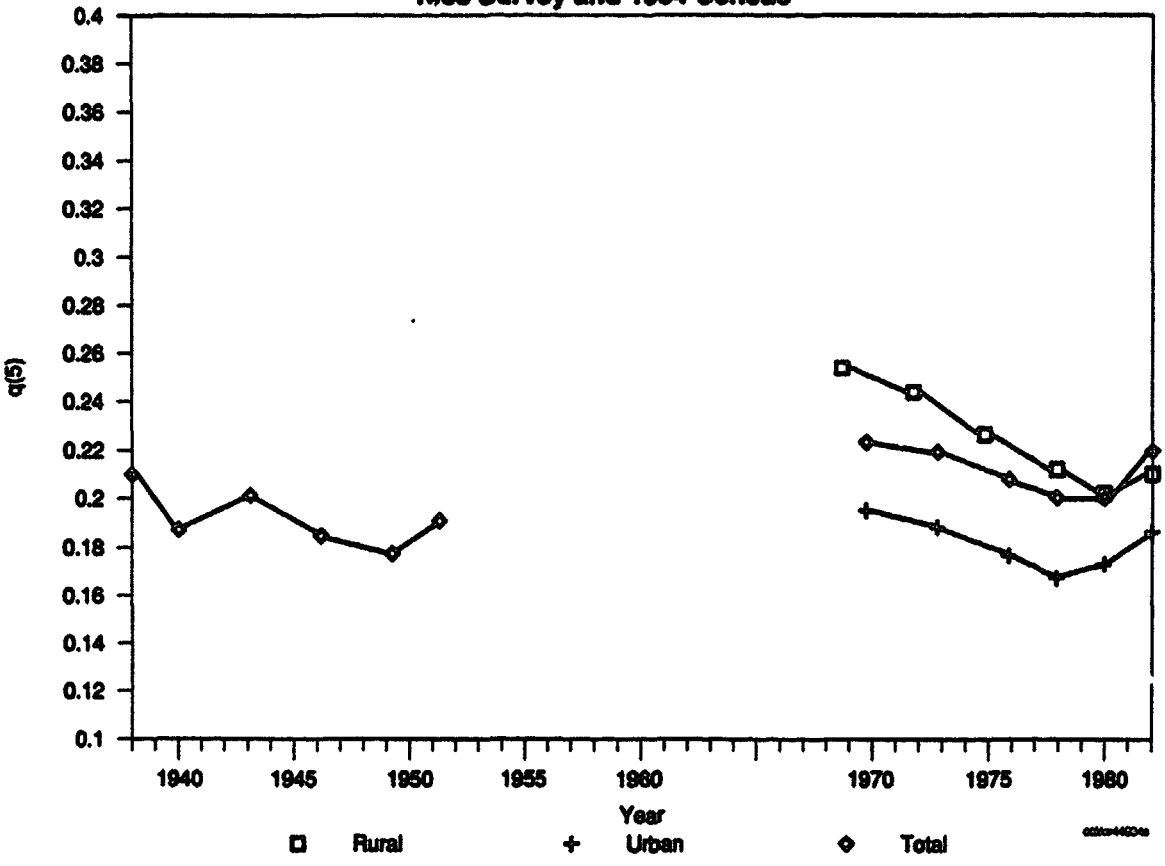


Figure II.5h
Kivu: Trends in Child Survival
1955 Survey and 1984 Census

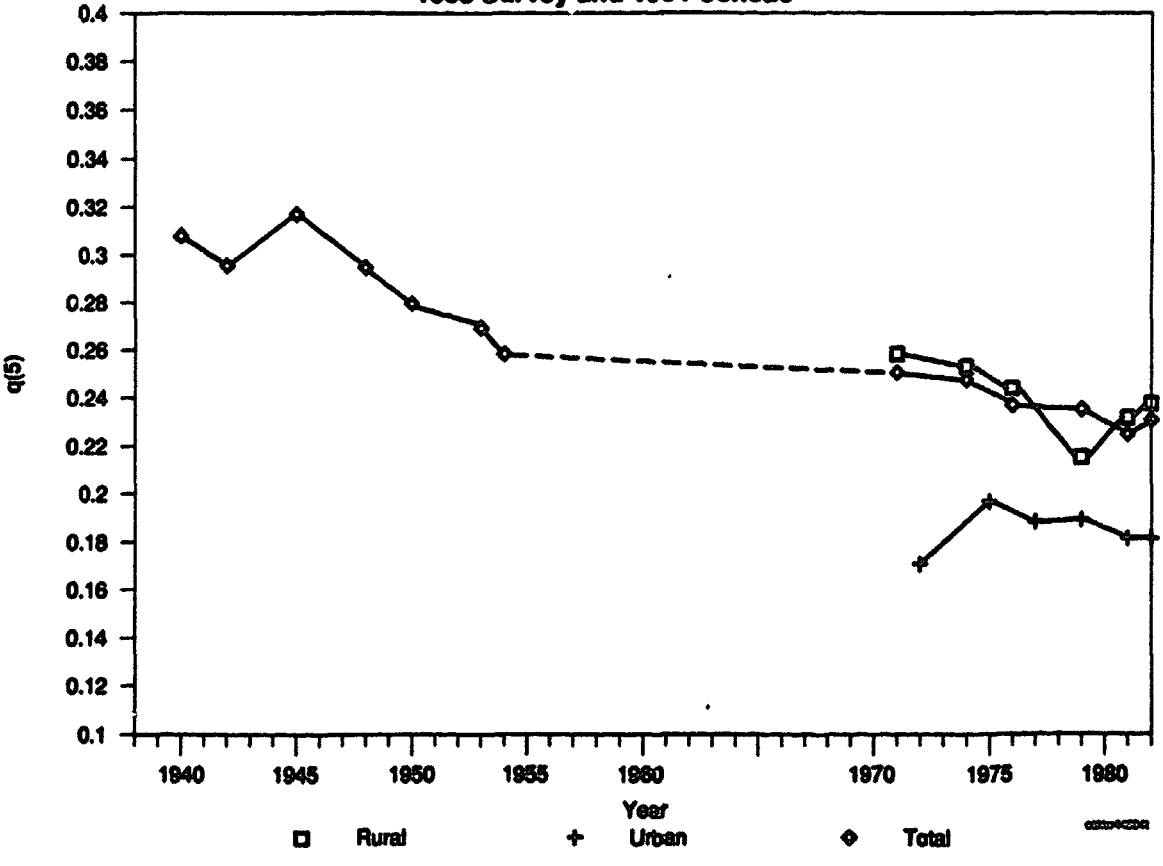


Figure II.5i
Zaire: Trends in Child Survival
1955 Survey and 1984 Census

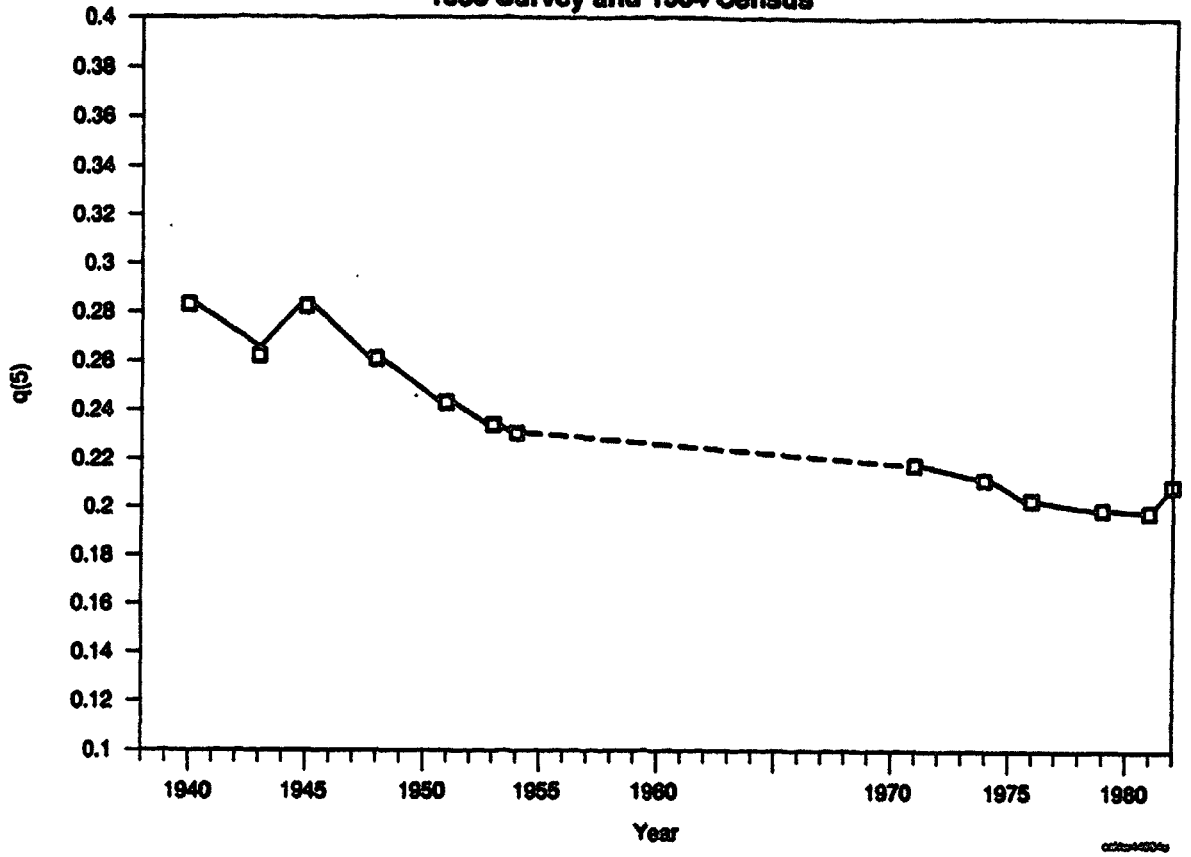


Figure II.5j
Trends in Child Survival, Rural Areas,
1984 Census

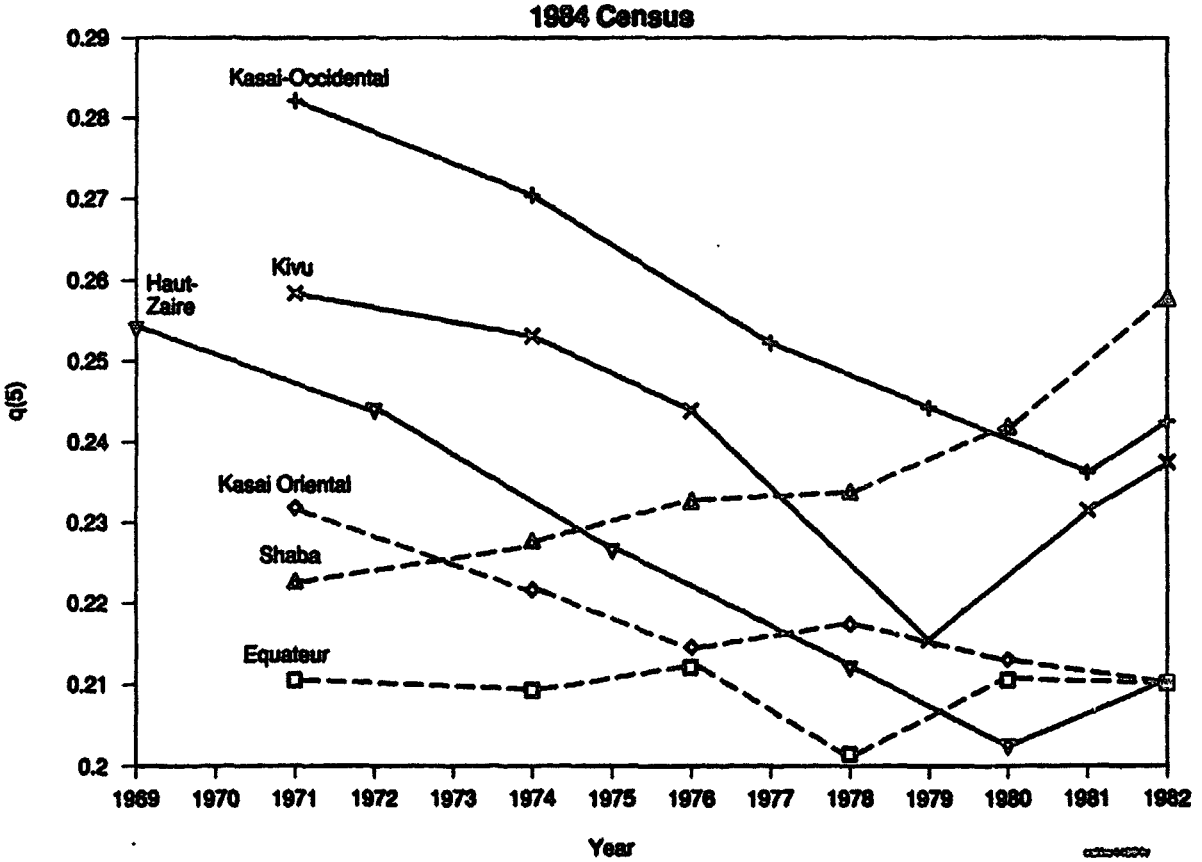
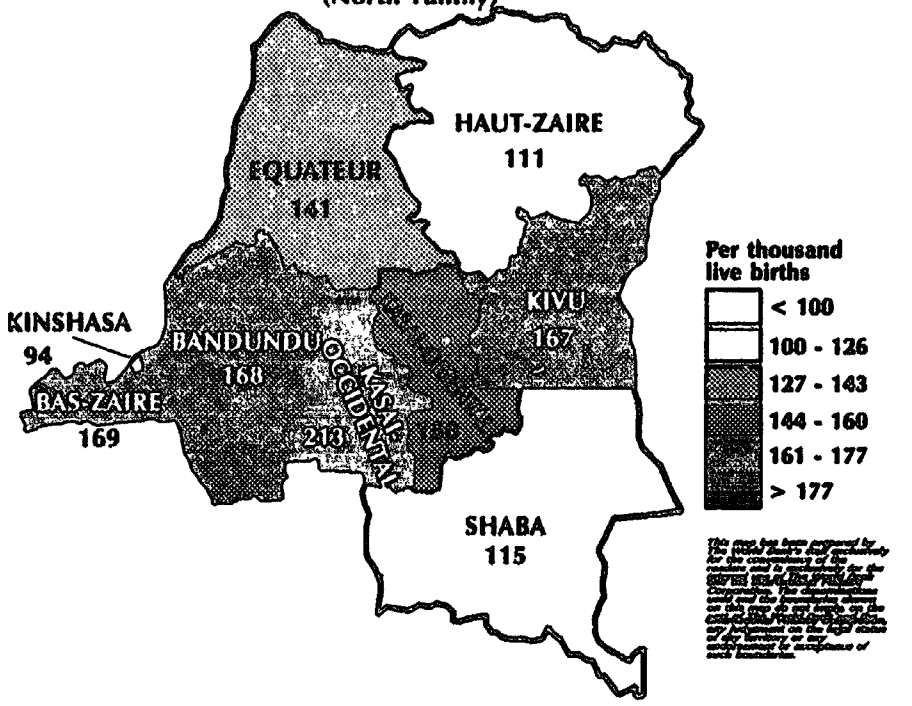


Figure II.5m

ZAIRE

INFANT MORTALITY RATE q(1), 1950-1952

(North Family)



July 1989

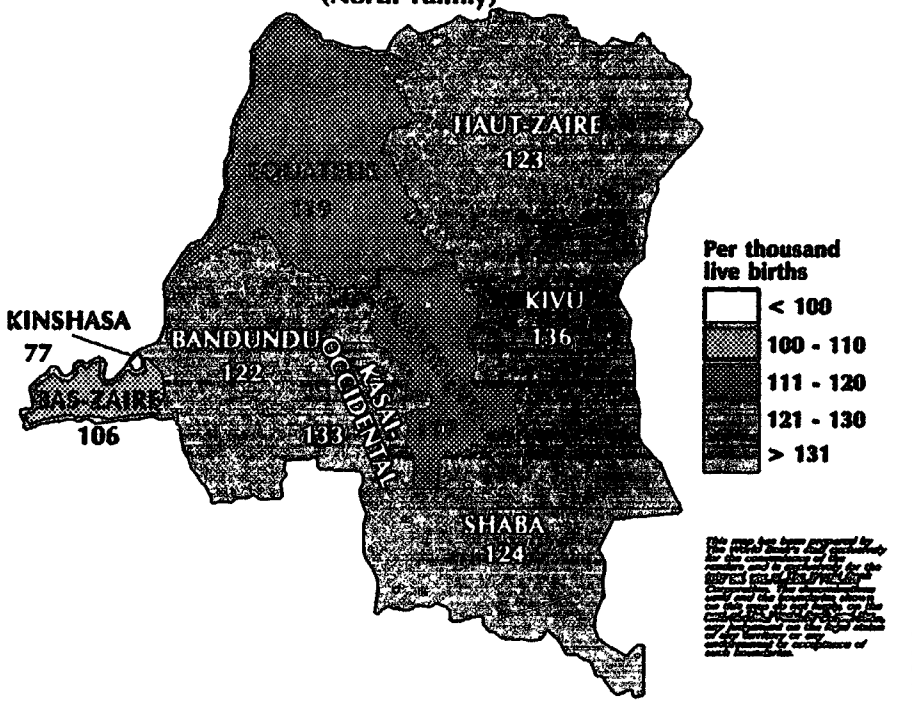
IBRD 21796

Figure II.5n

ZAIRE

INFANT MORTALITY RATE q(1), 1980-1981

(North Family)



July 1989

IBRD 21795

Figure II.5o

ZAIRE

EXPECTATION OF LIFE AT BIRTH (e°), 1950-1952

(North Family)

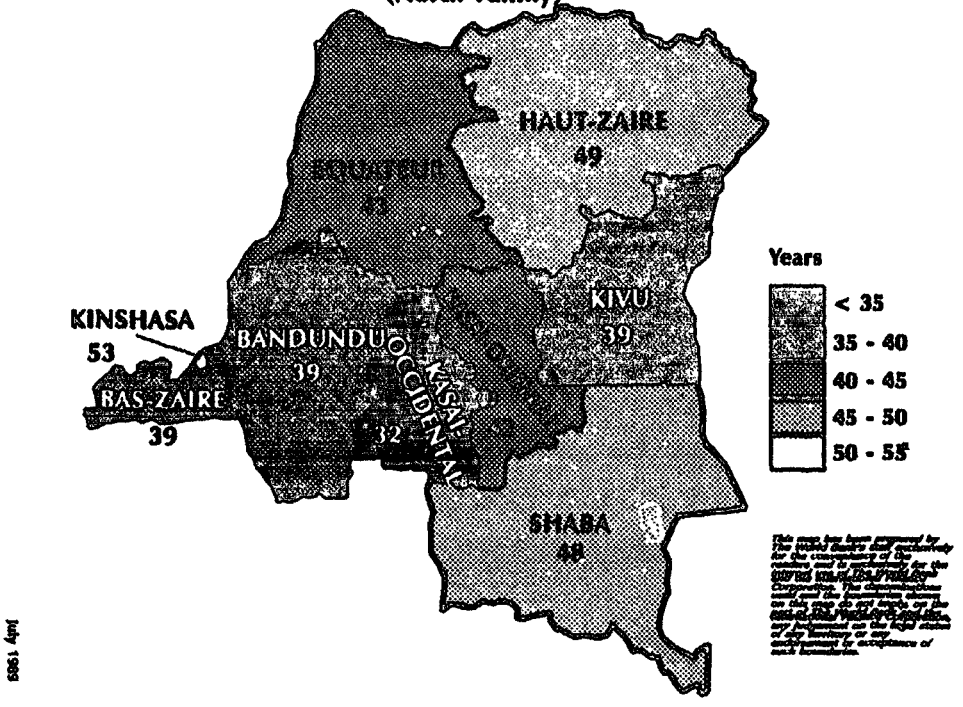


Figure II.5p

ZAIRE

EXPECTATION OF LIFE AT BIRTH (e°), 1980-1981

(North Family)

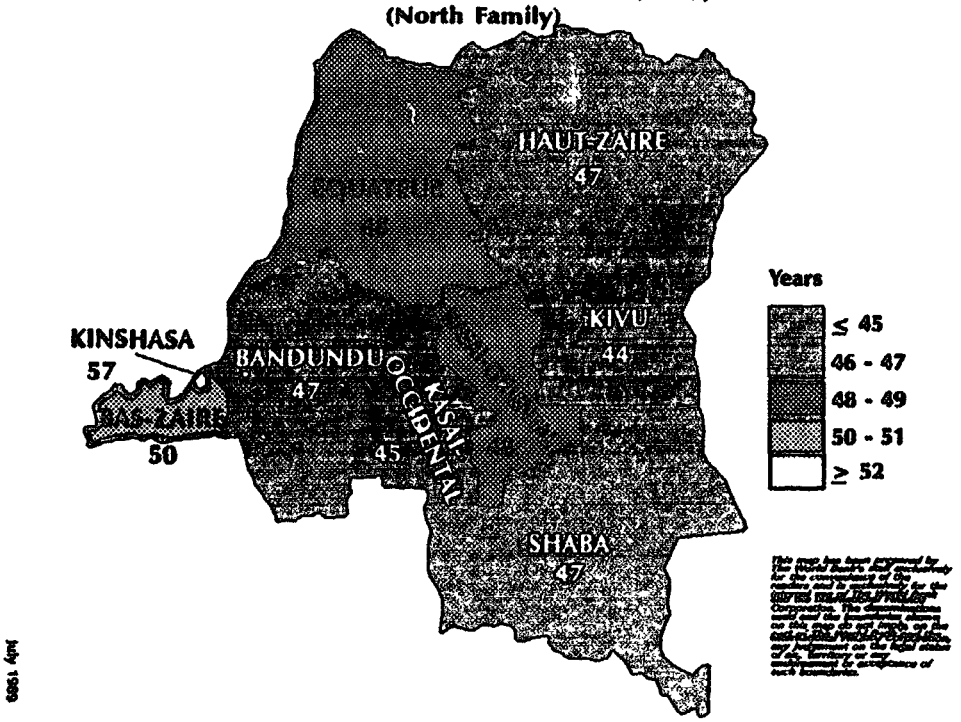


Figure II.6a
Age-Specific Fertility Rates
Reported, by Region

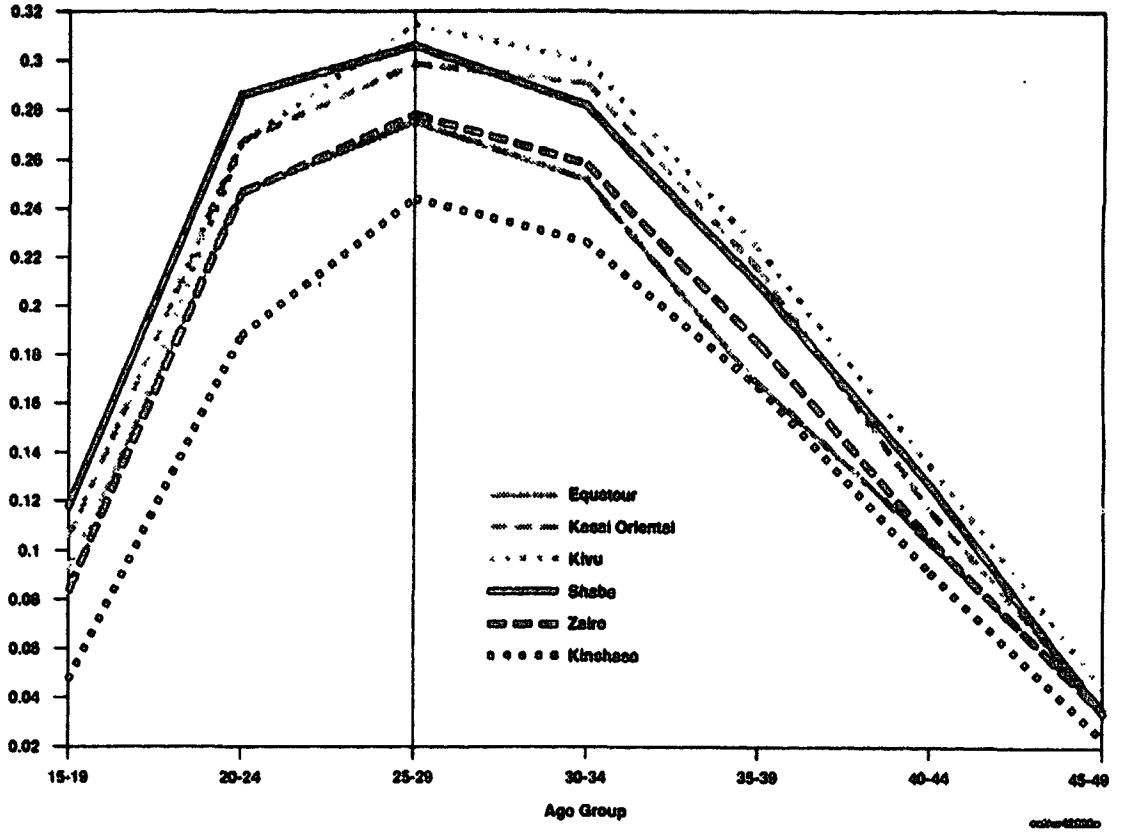


Figure II.6b
Age-Specific Fertility Rates
Reported, by Region

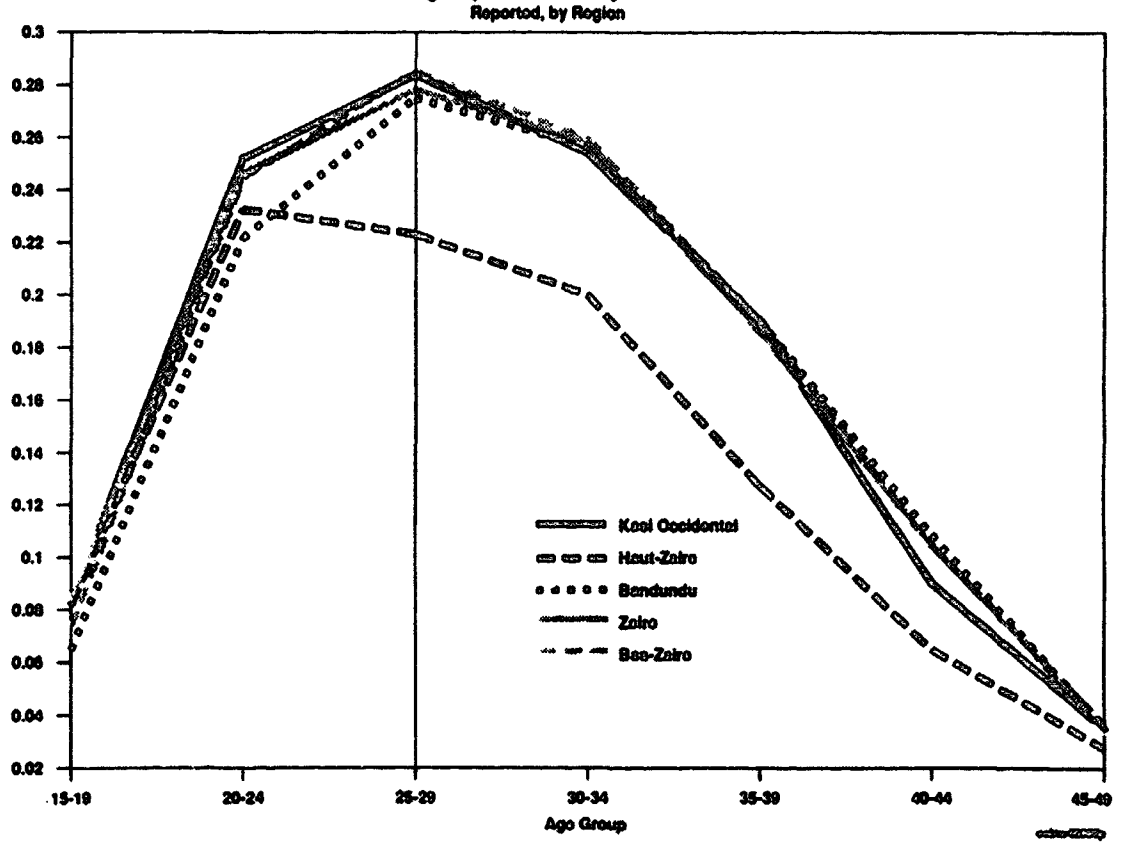


Figure II.7a
Zaire, P/F Ratios, by region

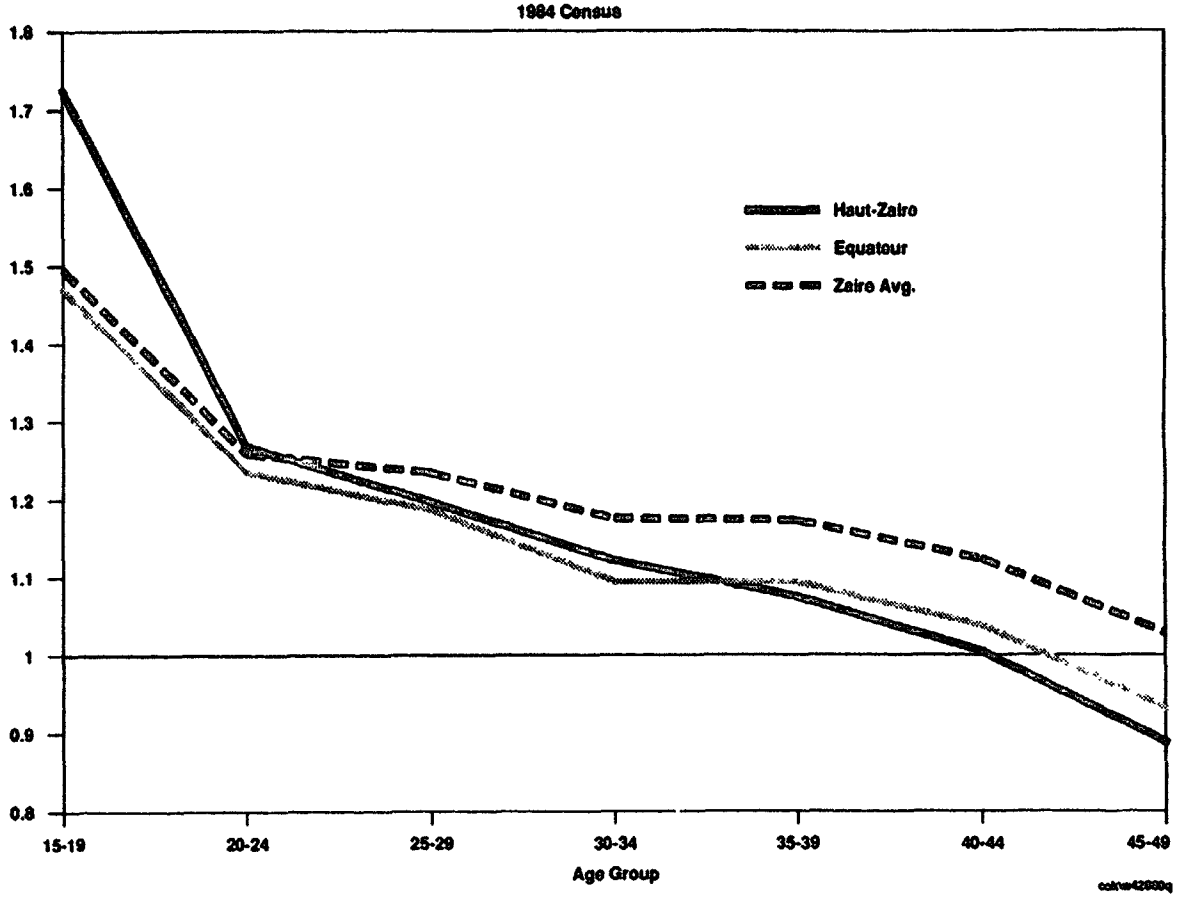


Figure II.7b
Zaire, P/F Ratios, by region

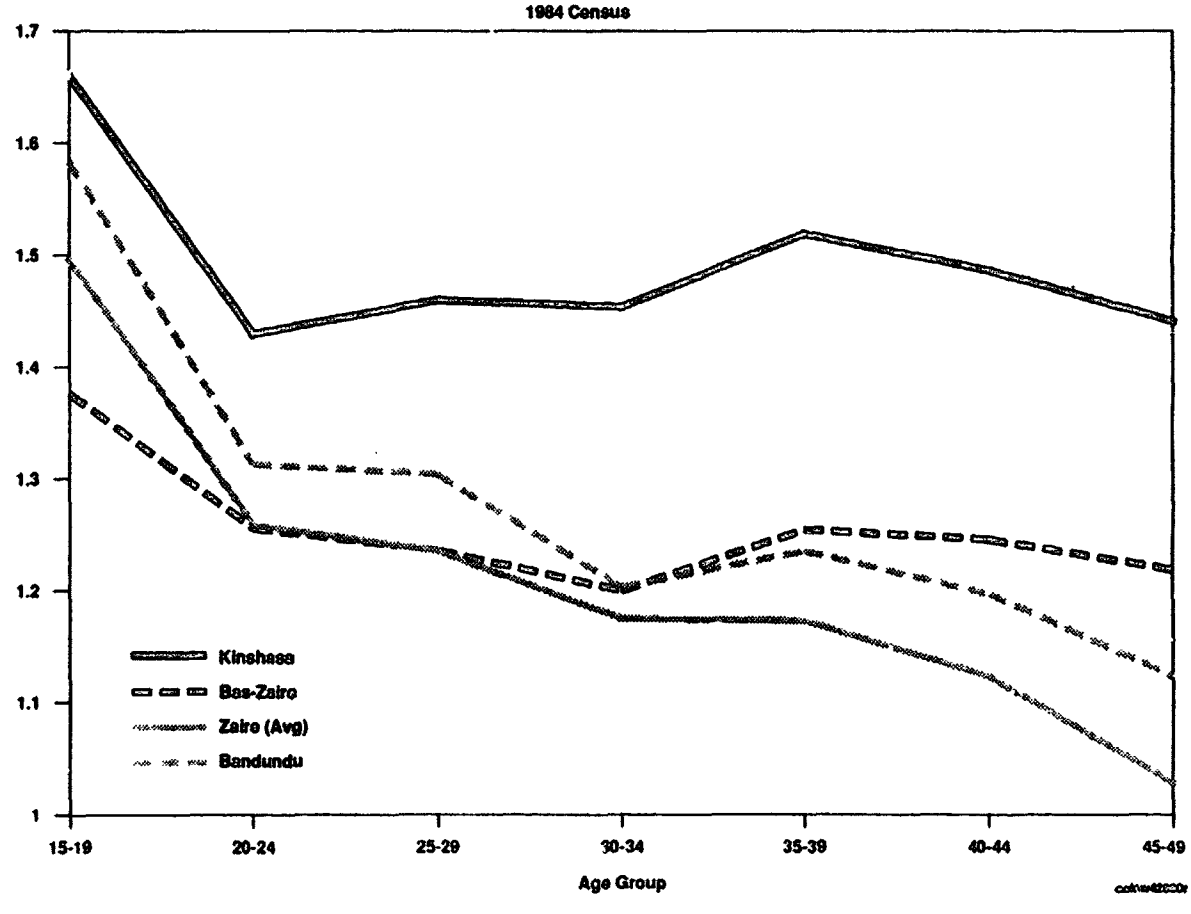
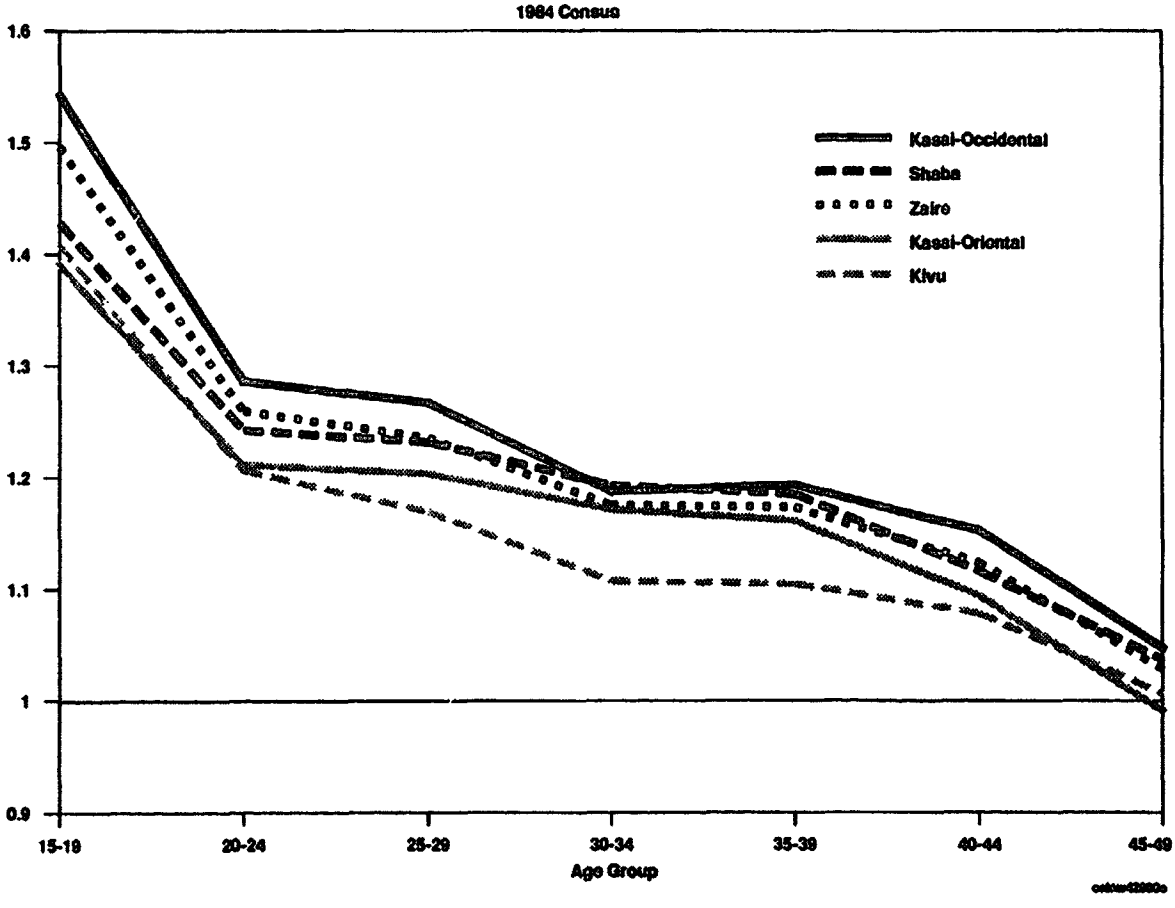


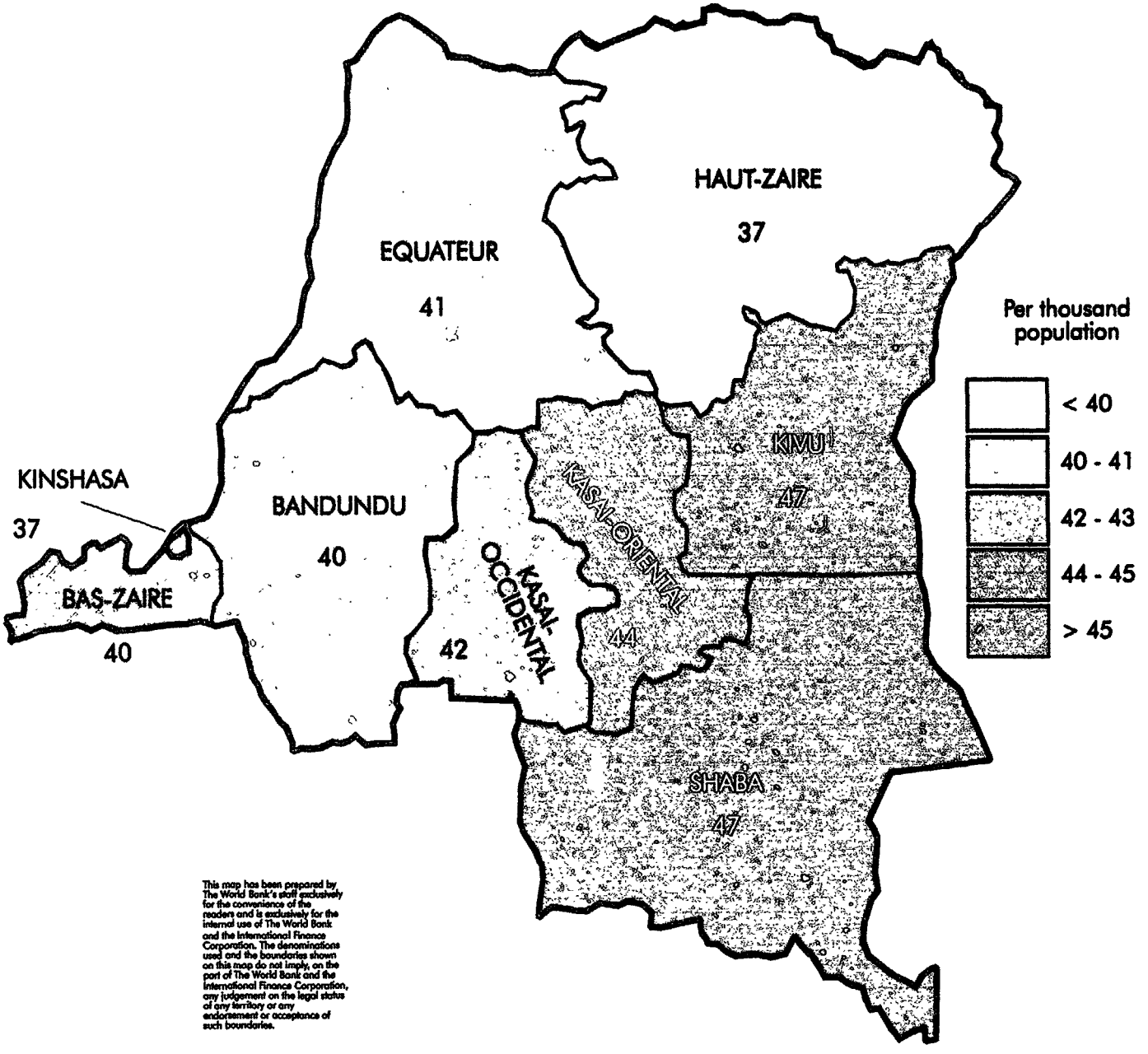
Figure II.7c
Zaire, P/F Ratios, by region



IBRD 21093

ZAIRE

CRUDE BIRTH RATE, 1984 CENSUS

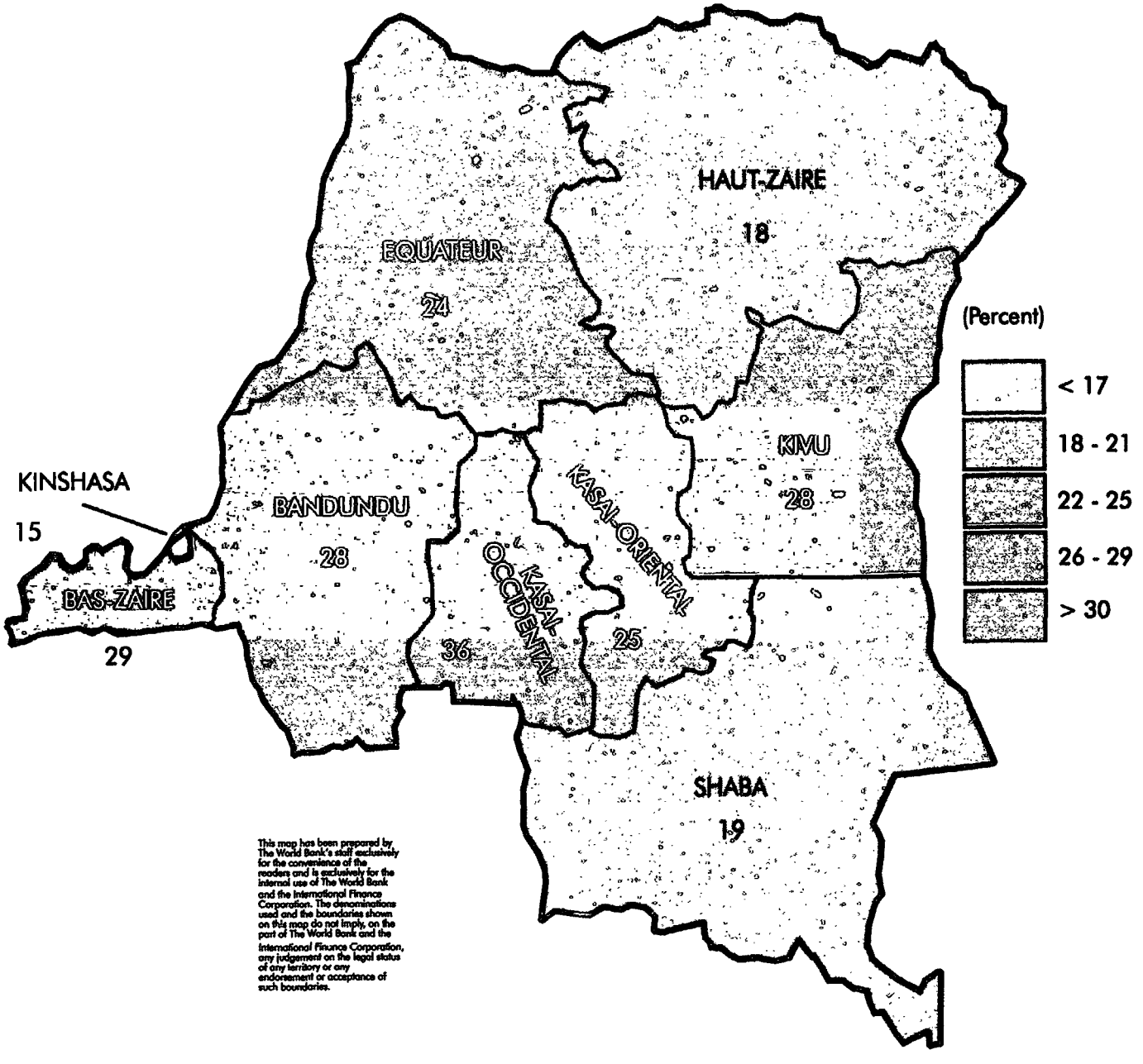


November 1990

IBRD 21100

ZAIRE

PERCENTAGE OF CHILDREN DYING IN FIRST FIVE YEARS OF LIFE q(5), 1950-1952

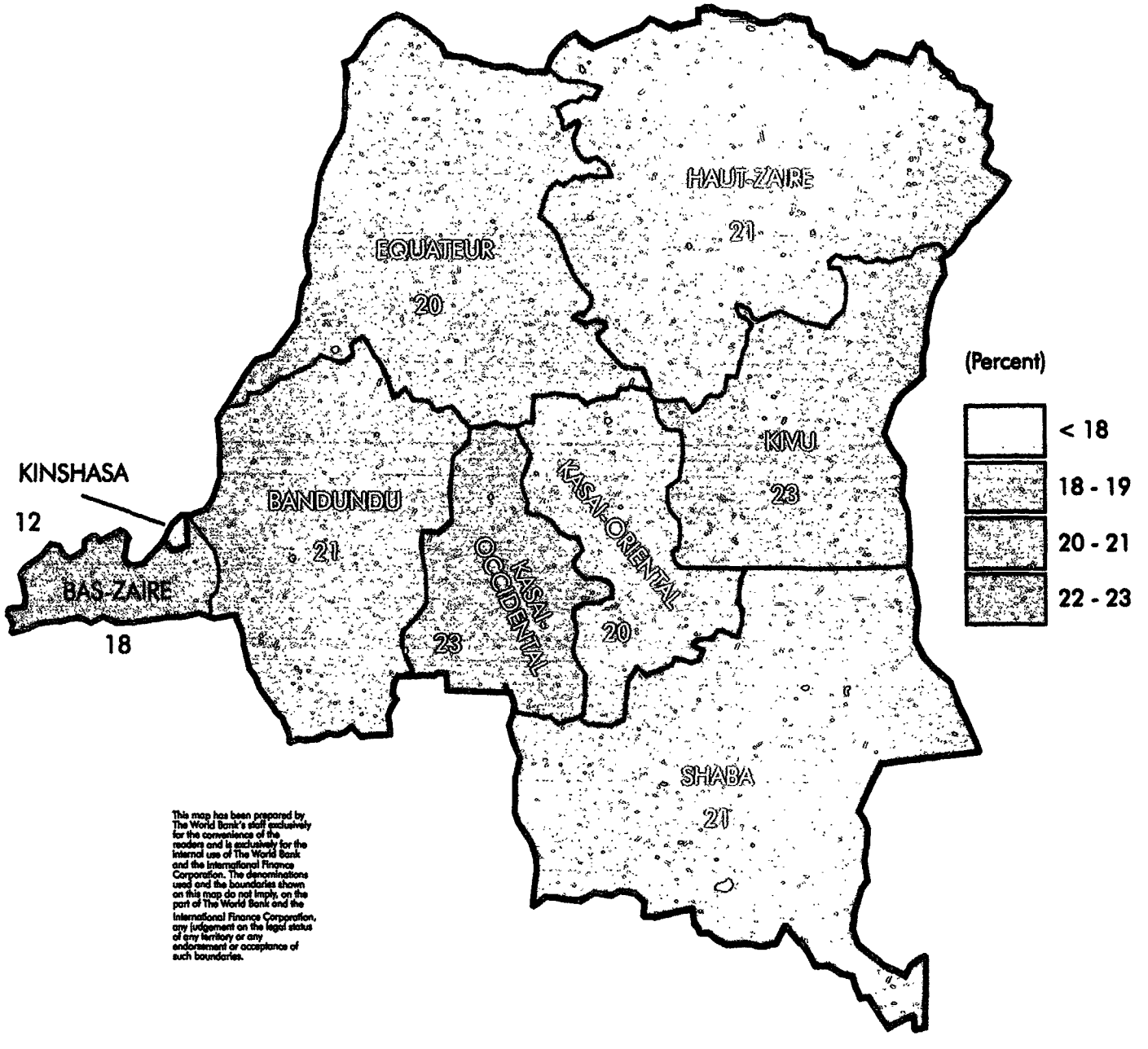


November 1990

IBRD 21099

ZAIRE

PERCENTAGE OF CHILDREN DYING IN FIRST FIVE YEARS OF LIFE q(5), 1980-1981

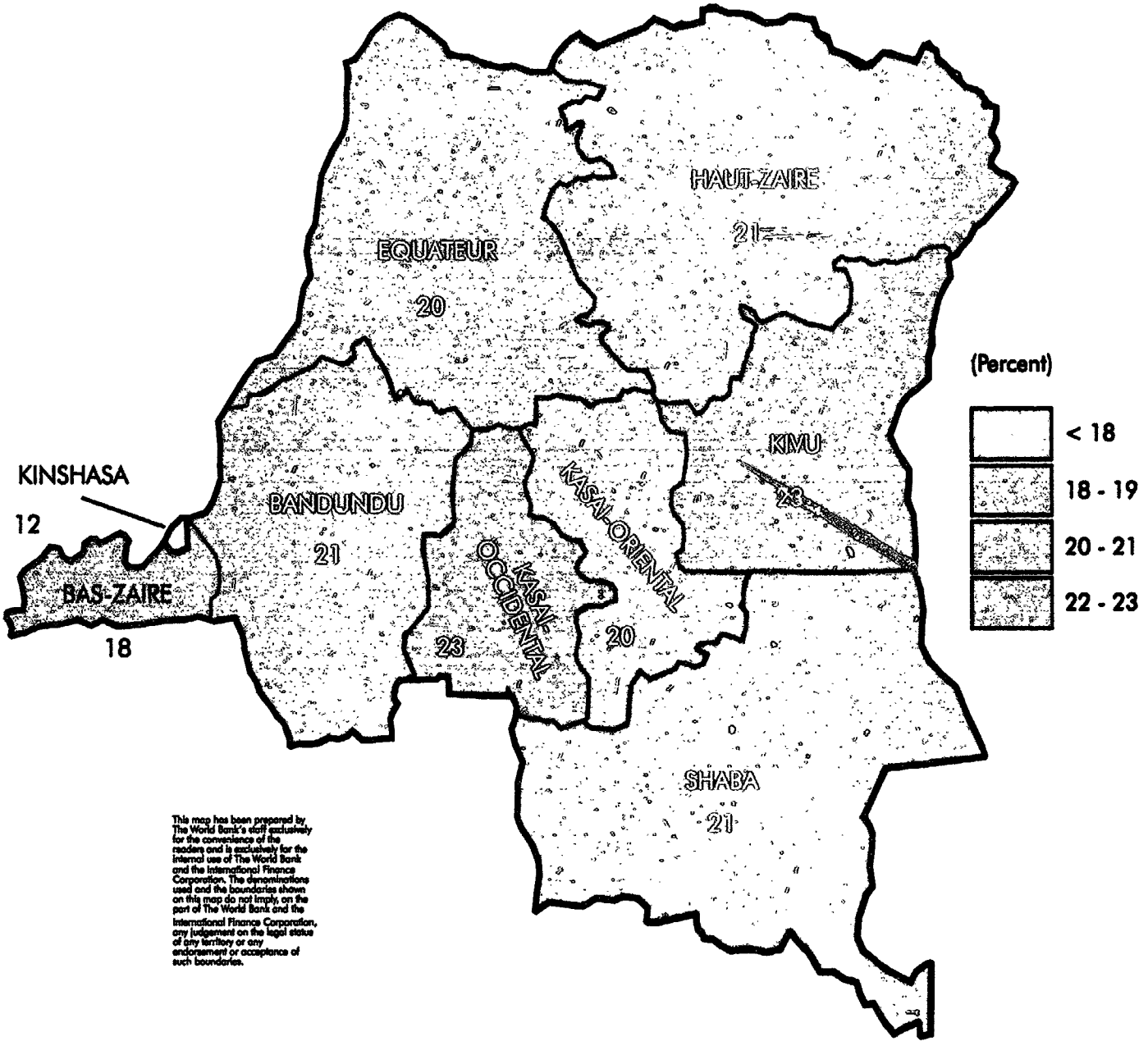


November 1990

IBRD 21099

ZAIRE

PERCENTAGE OF CHILDREN DYING IN FIRST FIVE YEARS OF LIFE q(5), 1980-1981



November 1990