

Timing of Fertility Transition in Kinshasa

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INTRODUCTION

Purpose

The purpose of this study is to analyze the history of fertility transition in sub-Saharan Africa, specifically, in the city of Kinshasa (Democratic Republic of the Congo). Before fertility transition began, ethnic group differences in fertility were very large in Kinshasa; now, fertility differences by women's education have become more important. The study will explore the timing and the age pattern of the onset of transition by looking at age-specific fertility rates (ASFRs) over time.

Background

Demographic transition is something that every industrial country has experienced. It can be defined as the transition from high birth and death rates to low birth and death rates. Fertility transition is that part of the demographic transition which focuses on birth rates. Europe and North America faced fertility transition early, in the 19th and early 20th century. However, developing countries in Asia and Latin America did not experience fertility transition until the latter half of the 20th century. Many recent studies involving fertility transition use the Demographic and Health Surveys (DHS). DHS surveys, which have been carried out since 1985, are nationally representative household surveys with large sample sizes of between 5,000 and 30,000 households, typically. DHS surveys provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. And the surveys are gathered from women ages 15-49. Part of the surveys covers reproductive behavior and intentions, contraception, antenatal, delivery, postpartum care, and children's health, among other topics (Demographic and Health Surveys, 2003). Because of these contents, DHS surveys help researchers to study fertility transition in developing countries.

According to Bongaarts (2002), who studied global fertility transition in developing countries after World War II, there are three general stages of fertility transition. In the first stage, fertility is high until the transition begins. In the second stage, once the transition gets underway fertility declines rapidly and tends to continue to decline. And in the last stage, the pace of decline decelerates as countries reach the later stages of the transition. Shapiro and Tambashe, looking specifically at sub-Saharan Africa, argue that there is a three-stage fertility transition by urban-rural changes. The

three-stage transition starts with fertility declining in urban areas while in rural areas staying at the same rate, then fertility declining in both urban and rural places but urban areas decline more rapidly, and at last with fertility declining more in rural than in urban areas (Shapiro and Tambashe 2002).

Significance of the Study

Sub-Saharan Africa is the last major region of the world to experience fertility transition, and DHS data shows that it is going through the early stages of fertility transition. Unlike other regions in the world, it has different characteristics in fertility transition that make it hard to predict what is going to happen in the future. However, some of the known factors that affect fertility rates are women's schooling, age at marriage, contraceptive use, and infant and child mortality (Shapiro and Tambashe, 2002). Another important aspect of this study is the direct relationship between the fertility rate and national population. So knowing future fertility rates will help sub-Saharan African countries to predict their populations in the future. Since the future is uncertain, this study will help sub-Saharan African countries to plan sufficient educational and health care systems.

Shapiro has already studied fertility decline in the city of Kinshasa (Shapiro, 1996). He analyzed data from a 1975 survey done in the city and data from a 1990 survey that he carried out, and he looked at fertility during the previous five years from both of the surveys and compared them. I will be looking at the fertility history data from 1990 and going farther back in time, so that I can look more closely at the changes and study the timing of fertility transition.

Research Questions

1. When did fertility transition begin in Kinshasa?
2. What is the age pattern of declines in fertility? That is, did older women initiate fertility transition only or by older and younger women?

Assumption

Sub-Saharan Africa is the last region to face fertility transition. Previous fertility transitions in Asia and Latin America had three stages of fertility transition beginning after WWII, with high fertility rates that decreased rapidly. The factor promoting fertility transition in Asia and Latin America was mostly economic development (Bongaarts, 2002). However, the rate at which fertility changes in sub-Saharan Africa will be different from any other region. And one of the most important factors that will influence the fertility rate will be the education of women.

Limitation

The 1990 data set has a sample size of only 2,450 childbearing-age women. Especially, the sample sizes of older women are quite small so data might not be

sufficient for the study. Also, recall error, where women are omitting or inaccurately dating their children's births, is a potential limitation on the study.

Review of literature

Fertility decline in the world

In the decades after World War II, developing countries in Asia and Latin America experienced fertility transition. As noted above, these fertility transitions had three stages. First, fertility is high until the transition begins, and once the transition gets underway fertility declines fairly rapidly and tends to continue. Finally the pace of decline decelerates as countries reach the late stage of the transition (Bongaarts, 2002, 5). The fertility transition in developing countries in Asia as well as fertility transitions in Europe began with older women, and only later did those transitions spread to younger women (Knodel, 1977, 231).

Fertility decline in sub-Saharan Africa

“Up until the latter part of the 1980s, sub-Saharan Africa was the only major world region in which fertility transition at the level of national populations had not yet begun” (Shapiro and Tambashe, 2002, 103). However, Garenne and Joseph argue that in general, fertility transition in urban areas began even before 1975, and fertility transition in rural areas began about 10 years later (Garenne and Joseph, 2002, 1841).

Also, Shapiro and Tambashe describe a “three-stage transition pattern in which overall fertility decline begins slowly and then accelerates. In the initial stage, with overall fertility quite high, rural fertility is more or less stable while urban fertility declines. Subsequently, both urban and rural fertility decline, with the decreases in the former being clearly larger than those in the latter. And finally, when a comparatively low overall level of fertility has been reached, the pace of continued fertility decline appears to be as great or greater in rural than in urban areas” (Shapiro and Tambashe 2002, 114).

“In general, urban women have more schooling, are considerably more likely to use modern contraception, are less likely to be in union, and experience distinctly lower infant and child mortality as compared to rural women” (Shapiro and Tambashe, 2002, 120). In most cases, schooling delays women from getting married or getting involved in a sexual union. And educated women use modern contraception to prevent unwanted pregnancy. Also, in urban areas the cost of living is much higher than in rural areas. And it is more likely that urban children get more education than rural children so it can be of a greater burden for urban families to have many children. However, rural families require hands to help out with their farming. So children can be more beneficial to rural families than to urban families. Therefore, urban areas have lower fertility than rural areas in sub-Saharan Africa.

Fertility Decline in Kinshasa

In mid-1955, Kinshasa had considerably higher fertility than the rest of the Congo. One of the reasons was that in the northern parts of country about 35 to 40 per cent of women over the age of 15 were childless. This was significant compared with a national average of 28 per cent and a figure for Kinshasa of 26 per cent. "Marriage occurred early in Kinshasa, with 62 per cent of women aged 15-19 being married and more than 90 per cent of those aged 20-24 living in sexual union. This reflected the low levels of women's schooling: fewer than ten percent of young women aged 15-19 was enrolled in school, with enrollment negligible at higher ages. Fully 64 per cent of those aged 15-19 had not received any schooling and the same is true of between 78 and 95 per cent of those in older cohorts" (Shapiro, 1996, 91). By 1975, the population had more than quintupled to a little over 1.6 million: an average annual rate of growth in excess of eight per cent. In Kinshasa, there was a slight increase in the crude birth rate compared to 1955 and a decline of the order of five per cent in the general fertility rate (Shapiro, 1996, 92). By 1990 there was evidence of further fertility decline among women aged 20-34, compared to those in the same age group in 1975. By contrast, numbers of children ever born in 1990 for women aged 35-49 were distinctly higher than in 1975.

"The single most important factor contributing to fertility decline in Kinshasa during this time period has been the tremendous increase in educational attainment of the adult female population" (Shapiro, 1996, 90). The majority of women of reproductive age in Kinshasa have now completed at least some secondary schooling. Increased schooling of women has contributed to increasing age at marriage and, for schooling at the secondary level and beyond, ultimately to reductions in fertility.

"Fertility differentials by schooling in Kinshasa were evident in 1975; however, numbers who had attended secondary school and higher education where these differentials are important were relatively small in the 1970s, and consequently had little impact on aggregate fertility behavior. By 1990, however, these groups comprised nearly two-thirds of the female population of reproductive age, and their behavior was an important component of overall fertility" (Shapiro, 1996, 90)

Methodology

This study will examine fertility decline in Kinshasa, capital of the Democratic Republic of the Congo. The study uses data from a 1990 survey carried out by Dr. Shapiro in Kinshasa. The survey covered a sample of 2,450 childbearing-age women. For each woman, the data include the age of the woman and the years when her children were born. With the data from the survey, we can calculate age-specific fertility rates (ASFRs) and the total fertility rate (TFR). From an earlier survey carried out in 1975, the TFR was estimated at 7.2, while for the 1990 survey it was estimated at less than 5.7. The TFR represents the average number of children women would bear in their lifetime, based on the current age-specific fertility rates. From this information, we can see the clear indication of fertility transition between 1975 and 1990. This study will use the data to

calculate ASFRs for various periods prior to the 1990 survey going back to the 1970s, and find out when and for what age groups fertility decline started in Kinshasa.

ASFR can be calculated by dividing the number of live births in each age group by the total female population in thousands in each age group. For example, let B_i be births to women age i during a particular year and let W_i be the number of women age i in that year. With this notation, the ASFR for women age i is calculated as a thousand times B_i divided by W_i . That is, the ASFR shows the probability of women having a baby in a single year. Multiplying that ASFR by five shows the expected number of children that women will bear while in that five-year age group. And adding up across all of the age groups tells the average number of children that women would bear during the course of their reproductive years if those ASFRs remained unchanged, i.e., the TFR.

In calculating TFRs, demographers often use a “window” or observation period of five years. It is conventional in demography to use 5-year age groups to cover the age range of childbearing women. That is, the youngest women are 15-19, 20-24 and the ASFR is calculated up through ages 45-49. In addition, TFR is defined as the sum of ASFRs from youngest to oldest multiplied by five and divided by 1000. Applying this equation, the TFR estimates are 7.2 for the 1975 data and 5.7 for the 1990 data, as noted above. These data show that there was fertility decline and we can assume that fertility transition occurred some time between 1975 and 1990.

I will be following demographic convention of looking at five-year age groups with five-year periods preceding the survey. The table below is an example of trends in age-specific fertility rates of Ghana in 1998. Ghana is a good example of a country that is experiencing fertility transition.

Age-specific fertility rates for Ghana, 1998

Age group	Number of years preceding the survey			
	0-4	5-9	10-14	15-19
15-19	90	104	117	123
20-24	192	213	242	265
25-29	206	247	257	255
30-34	183	216	241	[267]
35-39	143	162	[182]	-
40-44	79	[97]	-	-
45-49	[16]	-	-	-

Source: GSS and MI, 1999

We can see the declines in ASFRs for all age groups in the years preceding the survey, except for 10-14 years before the survey for women age 25-29.

I will analyze the Kinshasa data with five-year and two-year windows. This will detect evidence of fertility decline and indicate when fertility transition began in each age group. And I will be able to see if the fertility transition was initiated by older women, similar to what happened in the earlier European fertility transition and in the developing

countries of Asia in the 1960s and 1970s, or if the fertility transition was initiated by older and younger women, as Caldwell et al. (1992) suggested would be the case for sub-Saharan Africa.

Summary of Results

If we look at Figure 1, showing ASFRs for five-year periods, for women age 15-19 in the period from 1970 to 1974 the ASFR was 147, then 119.8 in 1975 to 1979, 94 in 1980 to 1984, and 96.9 in 1985 to 1989. From 1970-1974 to 1985-1989, the total decline in the ASFR is 50.1, i.e., about one third of the initial level. And for age group 20-24 there is a similar pattern, with the total decline in the ASFR being 111.9, again almost one third of the initial level. For the age group 25-29 declines are also present, with the total decline in the ASFR being 87.6, about one fourth of its initial level.

The situation was a bit different for the age group 30-34, with a hike between 1970-1974 and 1975-1979, but the ASFR declined after that. And for older age groups (not shown) the data sometimes show increases in ASFRs. We can explain this by small sample size. For 1985-1989 women in the age group 45-49 had a sample size of only 115. And 113 was the sample size for age group 40-44 in 1980-1984, age group 35-39 in 1975-1979, and 35-39 in 1970-1974. By comparison, the sample size was 2702 for age group 20-24 for the five-year period of 1984-1989. Since the sample size for older age groups are small, there is a greater likelihood the observations may not be accurate. The same issue is found in two-year period ASFRs.

Another explanation for lack of trend for age group 30-34 is the increase in educational attainment. As discussed in the review of literature, in most cases, schooling delays women from getting married or getting involved in a sexual union. As shown in Figure 3, not only is fertility falling but also the age pattern is shifting to later fertility. There is a big hike in the ASFR between age group 15-19 and age group 20-24 for both the early 1970s and the late 1980s. But in the early 1970s, there is a significant drop in the ASFR between age group 25-29 and age group 30-34. However, in the late 1980s, ASFRs stay close to each other from age group 20-24 to 30-34, which can be seen between age groups 20-24 and 25-29 in the early 1970s.

For Figure 2, the two-year periods, the transition isn't as smooth as for the five-year periods, but we can still see the declines in fertility for the younger age groups. For age group 15-19 there are two significant inclines from 1970-1971 to 1972-1973 and again from 1980-81 to 1982-83, but in general, the ASFR declined. In fact, between 1970-1971 and 1988-1989, the total decline of ASFR was 32.5. For age group 20-24, there is a clear indication of ASFR decline for most of the period. Age group 25-29 has more variability, but still shows a general pattern of decline.

Conclusion

We can conclude from these data that fertility transition was already under way in Kinshasa by 1975 (apparent from the early 1970s on). We can tell this from Table 1. Table 1 shows ASFRs for five-year periods preceding the 1990 survey. As discussed in

the results, for younger age groups we see pretty much continuous decline in ASFRs starting from 15-19 years preceding the survey, which is the early 1970s. Therefore, even though the data did not contain sufficient sample sizes for older women it is safe to say that younger women (15-29) clearly played an important role in Kinshasa's fertility transition.

Future studies

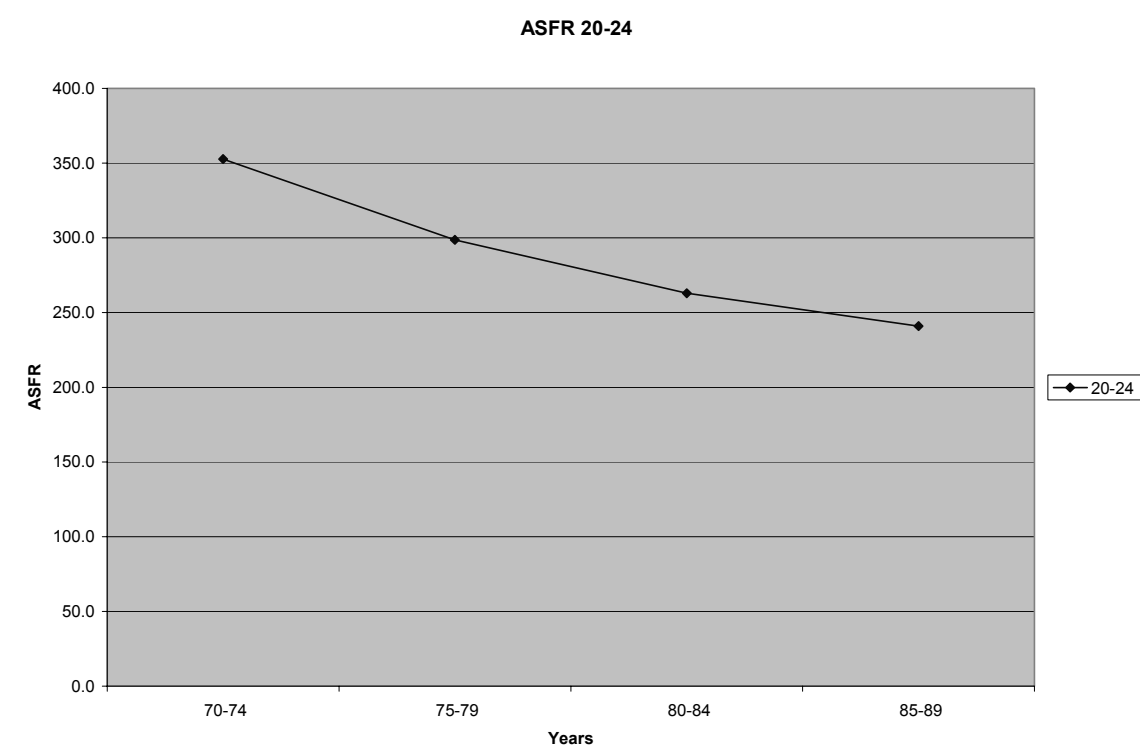
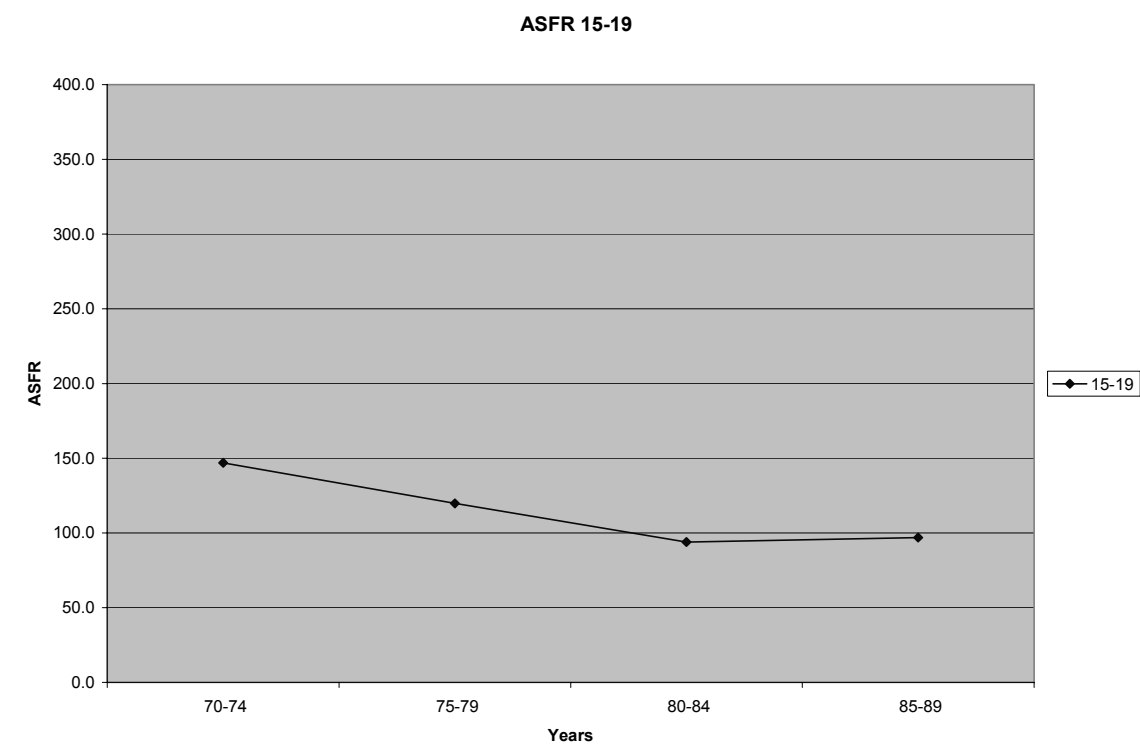
Because of limited time, I haven't had a chance to study the differences in the onset of fertility transition according to ethnic group and education. This is the area in which I plan to pursue this research.

Table 1
Age-specific fertility rates for city of Kinshasa, 1990

Age group	Number of years preceding the survey			
	0-4	5-9	10-14	15-19
15-19	96.9	94	119.8	147
20-24	240.8	263	298.6	352.7
25-29	274.6	275.8	315.2	360.2
30-34	241.1	264.4	276.1	[237.5]
35-39	194.4	168.1	[166]	-
40-44	79.8	[55.9]	-	-
45-49	[2.0]	-	-	-

Calculated from birth history data as of 1990 survey.

Figure 1 Age-specific fertility rates, five-year periods



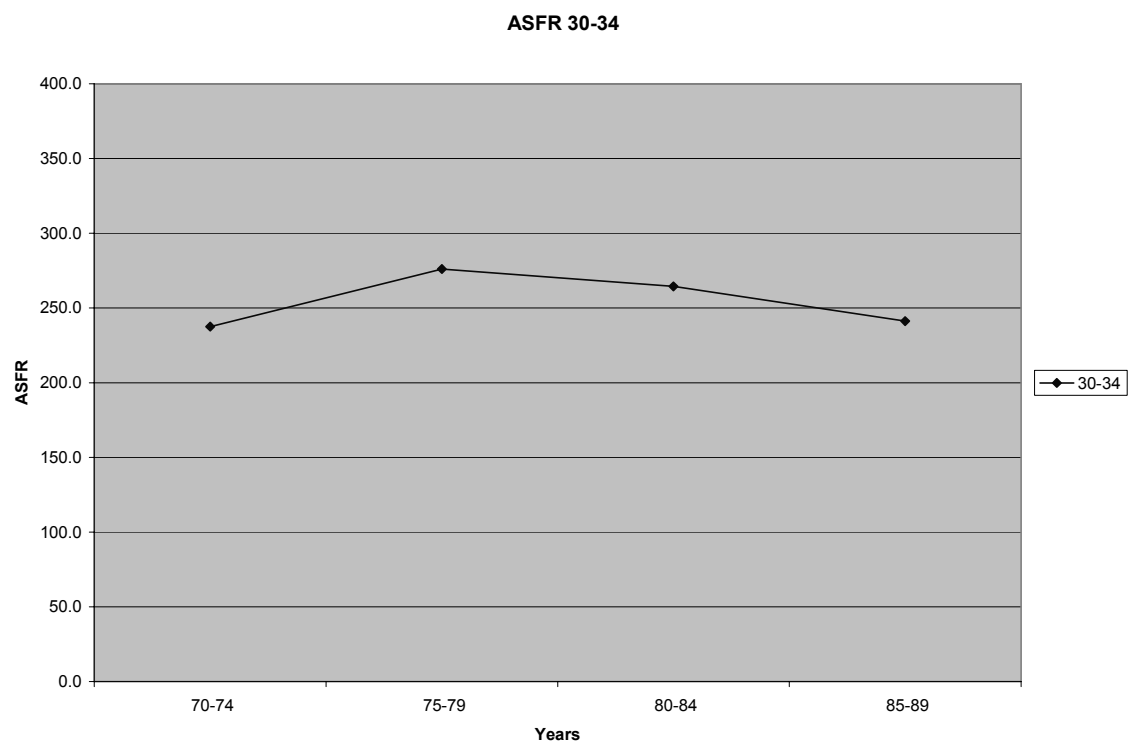
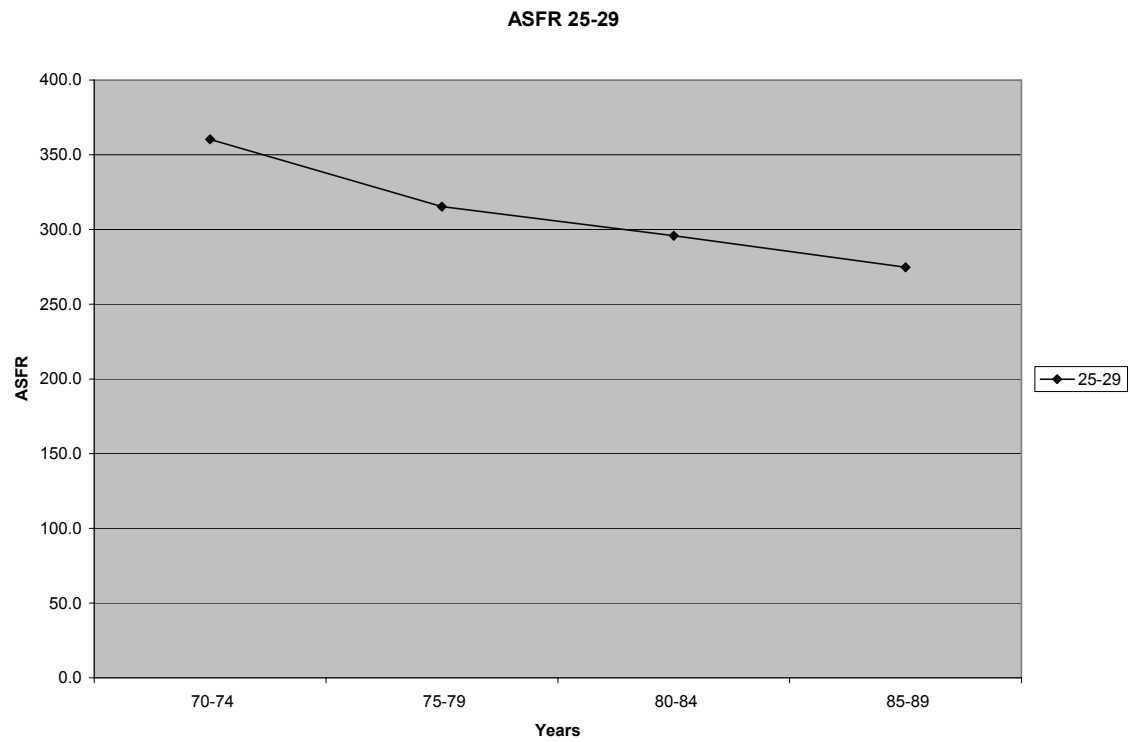
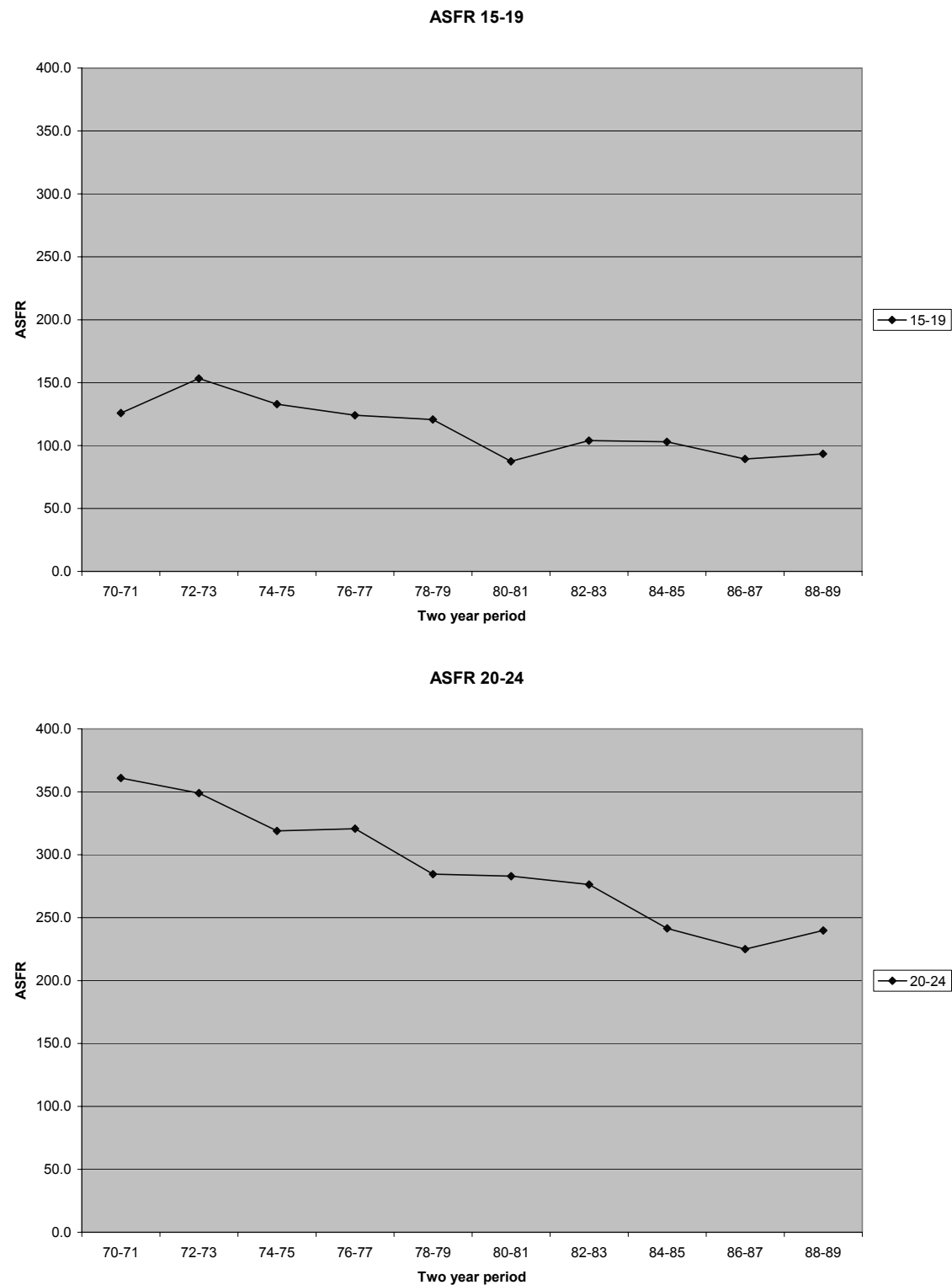


Figure 2 Age-specific fertility rates, two-year periods



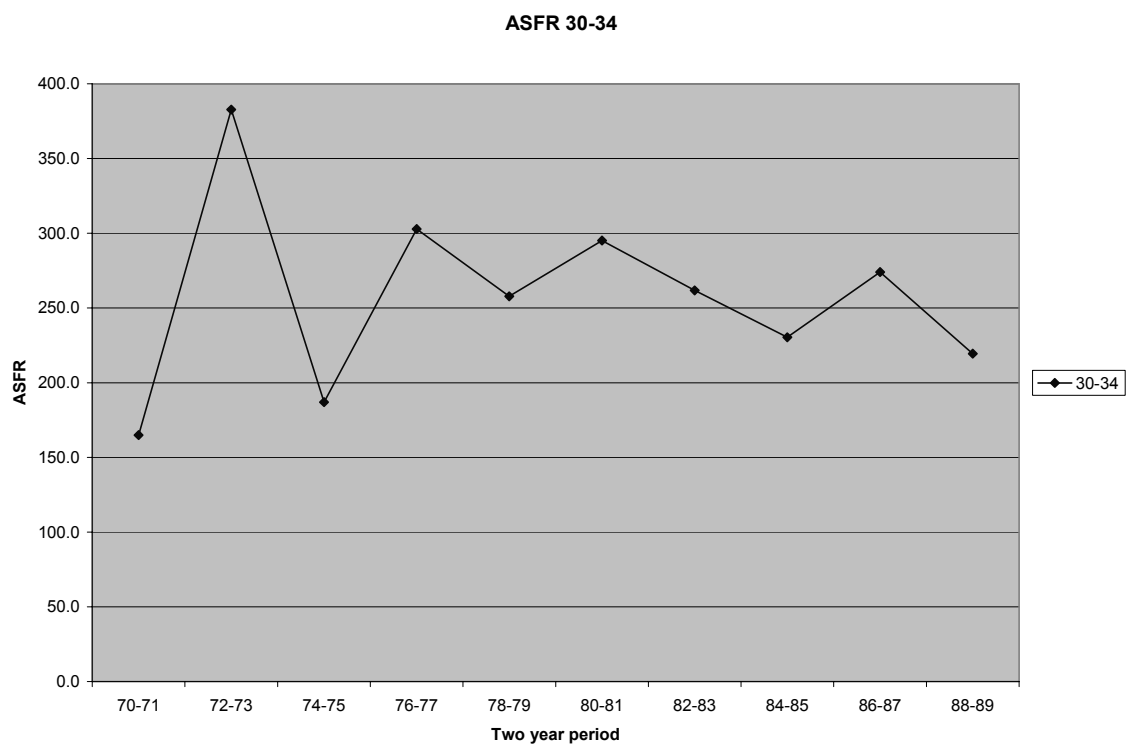
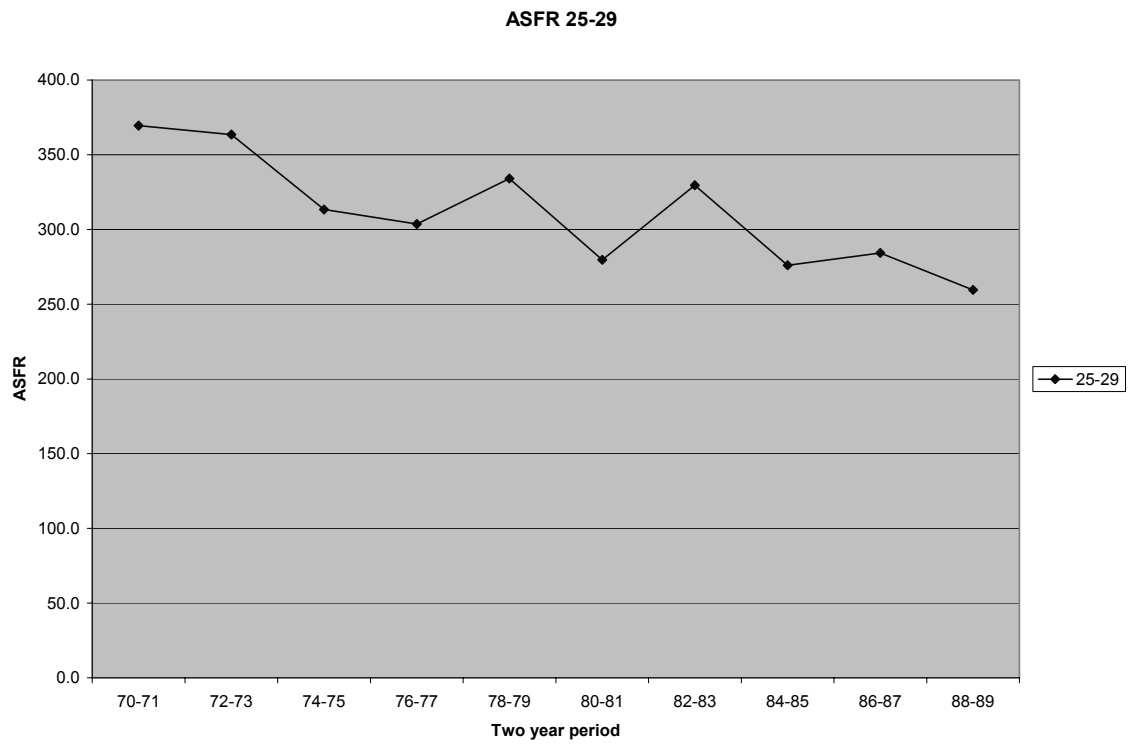
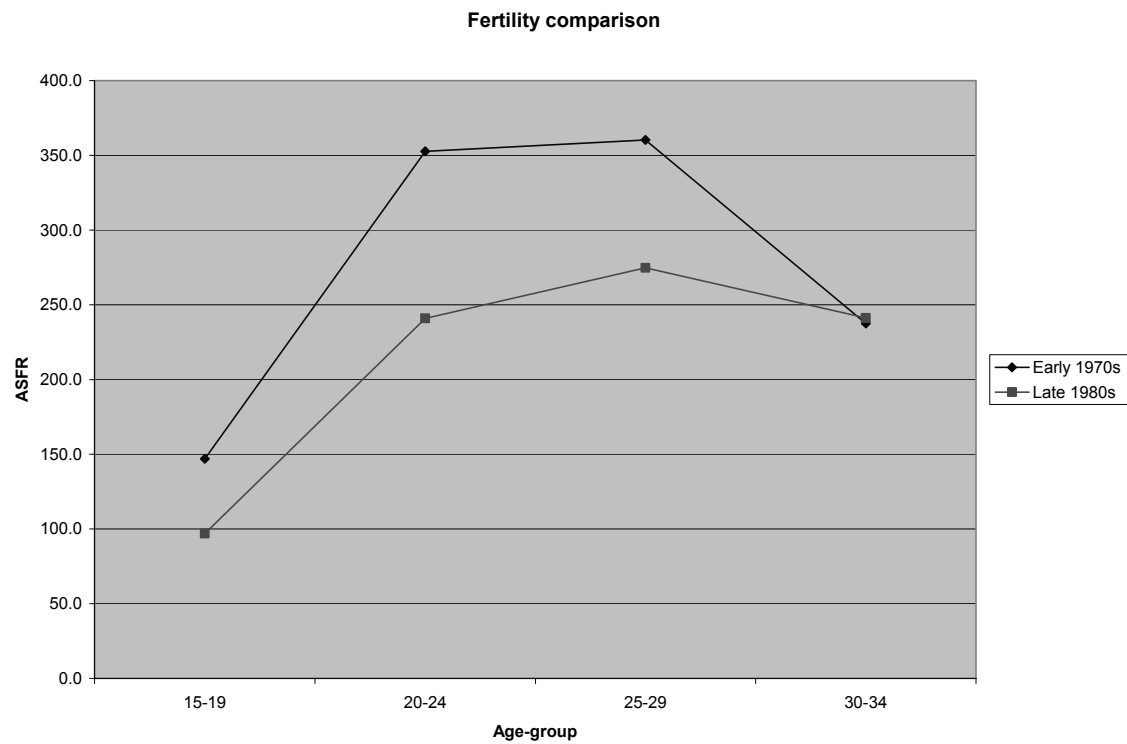


Figure 3 Fertility comparisons in early 1970s and late 1980s.



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