THE PREVALENCE AND CORRELATES OF CONSANGUINEOUS MARRIAGES IN YEMEN: SIMILARITIES AND CONTRASTS WITH OTHER ARAB COUNTRIES[*]

by

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Introduction

The practice of consanguinity, defined broadly as marriages or unions between individuals of the same blood, has declined remarkably in most developed countries. However, within many populations of the developing world, marriages between biological relatives remain common. This is especially true in societies where Islam prevails, with consanguineous marriages accounting for 20-50% of all marriages (Bittles 1991, 1994). But even when among Muslims, first and more distant cousin unions are acceptable, uncle-niece marriages are not permissible being regarded as incest relations. However, consanguinity is not unique to Muslim societies. Rather, it has been found that about 20-45% of unions in South India, where Hindu belief prevails, are between blood relatives (Bittles 1991, 1994). A similar trend propelled instead by socio-cultural customs has been documented among some sects in West and South Asia, such as the Buddhist, Christians, Jews, Parsees and Druze (Bittles 1991, 1994).

This, in turn, shows that while in general consanguinity results from religious norms and prescriptions, cultural and historical factors are also important in maintaining this practice. Irrespective of the reasons supporting such marriages, it has been found a higher prevalence of consanguinity among the rural, the less educated and among those who marry at younger ages. This means that the lower the

socioeconomic profile of individuals, the higher the propensity of unions between biological kin. In view of that, cousin marriages have been associated with higher fertility levels and completed family size.

It is important at this point to bear in mind that even while modernization may inevitably reduce the incidence of consanguinity, it still may not totally eradicate this practice. There are various reasons for that. First, such marriages are considered more socially stable and economically beneficial, through the maintenance of the family fortune, which is preserved within the extended family structure or tribe (Bitlles 1994; Al-Gazali *et al.*, 1997). A second reason is the increasing better prospects of the young couple, especially for daughters. This is so because unions between relatives enhance woman's status by allowing her a better relationship with her spouse and his family (Bittles 1991, 1994). Additional factors supporting this practice are the perceived risks of marrying to a stranger and the easiness of the marriage preparations among family members (Radovanovic et al., 1999; Bittles, 1991). Finally, in high fertility societies, marriage between cousins is likely to remain quite common for some time because of the increase in the availability of cousins attributed to greater survivability of children with improvements in public health services (Bittles 1994; Givens & Hirschman, 1994).

Specifically, marriage between relatives has been recognized in recent decades as a common Middle Eastern practice with many populations in this region stating their preference for a man marrying his father's brother's daughter (Bittles, 1991; Khlat & Khudr, 1984). Even though consanguinity is a central feature of family systems in the Arab World, studies on consanguinity have been limited for only few of the countries in this region. Particularly, this is true for Yemen where studies on consanguinity continue to be lacking. In view of that, it may be of interest to find out the prevalence of consanguinity among the Yemenis population; the distribution of marriages by relationship (first cousins, more distant relatives, or no relationship); the socioeconomic correlates of cousin marriages; and the trend in consanguinity in Yemen.

Subjects and Methods

The Setting

The Republic of Yemen, located in the southern part of the Arabian Peninsula, has a number of important political, social, demographic and economic characteristics. A review of such characteristic features will be helpful to put the present study into context.

A turning point in the history of Yemen has been the unification of the two Yemeni states, especially since the existence of two civilizations in Yemen has always been the norm. Despite stated intentions for integrating the two Yemens had existed throughout the 1970s and early 1980s, it was not but until the end of 1989 that the Yemeni leaders of both states begun seriously to arrange the task of building a unified Yemen. On May 22, 1990, a long-standing Yemeni national dream became a reality when the Yemen Arab Republic (North Yemen) and the People's Democratic Republic of Yemen (South Yemen) were unified in the Republic of Yemen (Kostiner, 1996). This resulted in the democratization of the country and the establishment of political parties. But, the honeymoon lasted shortly. Caught in the enthusiasm for change, the leaders ignored or at least disregarded the deep-rooted nature of the political systems, cultural norms and the interest of the elite, which had the potential to frustrate their hopes. These coupled with the economic recession resulting from Yemen's pro-Iraqi stance triggered the stage of unrest in Yemen in 1994. While Salih was able to put an end to this internal strike through military might, it still remains to be seen whether this integration will grow into a united and progressive or, once more, into a "war-ridden" entity (Kostiner, 1996; al-Suwaidi, 1995).

The Republic of Yemen has also a number of cultural and socioeconomic features. Socio-culturally, Yemen, like the rest of the countries in the Arab region, has a Muslim majority and is characterized by a history of arranged marriages, patrilineal descent, ideology of male authority and a significant preference for consanguineous and polygamous unions. As for the demographic characteristics, high fertility rates and rapid population growth have been a significant problem for Yemen, even before its unification. A number of factors, many of which rooted in traditional practices, are considered responsible for Yemen's excessively high fertility. One of such factors is early marriage. Yemen is an example of a nation where marriage is nearly universal, with the average age at marriage being below age 17 for females. Moreover, the

government's attempts at influencing age at marriage have been very limited, and little effort has been done to supply contraception. Other demographic features of Yemen are that most of its inhabitants are rural and a low socioeconomic background characterizes most of those living in urban areas. The problem of female illiteracy is also a challenge, especially because of its association with lower age at marriage, high fertility and lower contraceptive use. Coupled with this profile of a large and growing population is a classic picture of a less developed country, with a deteriorating real per capita GDP. This has been attributed to economic pressure in the early 1990s due to the sudden repatriation of almost one million workers from Saudi Arabia and the Gulf countries during the 1990-91 Gulf crisis, leading to high rates of unemployment, inflation and declining revenues (ESCWA, 1999).

Such political, social, demographic and socio-economic features make the study of consanguinity in Yemen quite interesting and it allows to test the validity of the following hypotheses: The lower the socioeconomic characteristics of individuals, the higher the prevalence of consanguineous marriages in the population and the more likely the trend in consanguineous unions is to either remain constant or increase.

Data Collection

The investigation is based on secondary analysis of the data obtained in the 1997 Yemenis Demographic and Maternal and Child Health Survey (YDMCHS). The YDMCHS is a nationally representative survey of ever-married women aged 15-49, the second survey conducted in Yemen since its unification on May 1990. The survey collected information on child mortality, marriage, fertility, family planning, reproductive preferences and attitudes, maternal mortality, and female circumcision. The sample for the survey was constructed based on the 1994 Yemen's census. The YDMCHS was designed to enable data analysis for Yemen as a whole, and separately by rural-urban origin, by three ecological zones (Coastal, Mountainous, and Plateau and Desert) and by northern-west and southern-east geographical regions. 10,414 successful interviews with eligible women in the households were carried out: out of these, 9750 interviews were with currently married women in the age range 15-49. A total of 24 cases were excluded because responses were missing, with 9726 women being included in the analysis (Central Statistical Organization, 1998).

Data Analysis

The dependent variable of consanguinity is based on a question in the individual YDMCHS questionnaire that asks the respondent if she has a blood relation to her last husband. The response categories to this question are: "Aunt/uncle'son-Fath'", "Aunt/uncle'son-Moth'", "Other relatives", and "No relationship". This question has been asked only to currently married women. Though there is a question that asks the respondent if she has a blood relationship with her first husband, this question has not been used because it has a low frequency rate of response. In the present case, this is not much of a problem since the rates of divorce, widowhood and remarriage in the sample are negligible.

For the analysis, the prevalence of consanguinity in the Yemeni population is first estimated. Then, the socioeconomic characteristics of consanguineous versus non-consanguineous marriages are obtained. To study the correlates in consanguinity, the following respondent's background characteristics are used: the women's level of education and work experience before and after marriage, residence, region, age at first marriage, husband's education and occupation and housing characteristics. The main hypothesis of this study is that women's pre-marital role and socioeconomic status as well as that of her husband are strongly associated with the prevalence of consanguinity in the population. Thus, the variables used reflect to a large extent differences in development, values, attitudes and behavior. The percentage of consanguineous marriages is presented for each category of the independent variables. For this purpose, bivariate analysis has been undertaken to test the statistical significance of the predictors on the response variable. Finally, the trend in consanguinity by respondent's year of first marriage is examined. Also, a multivariate statistical analysis has been carried out using SPSS to ascertain the contribution of selected predictors in explaining the variability of the response variable. Specifically, with consanguinity measured as a dichotomous dependent variable, logistic regression has been used to estimate the impact of the social correlates as the natural log of the odds.

**** Table 1 about here

Results

Bivariate Analysis

For the population as a whole, it has been found that consanguineous marriages are quite common in Yemen. Among ever-married women under 50 years of age, more than one-third (39.9%) reported that they have a blood relationship with their husbands. First cousin marriages constituted 33.3% of all marriages. Specifically, paternal first cousin constitutes 23.9% of all marriages and 71.8% of first cousin marriages while maternal first cousin constitutes 9.4% of all marriages and 28.2% of first cousin marriages. The rest, 6.6%, were consanguineous unions related through more distant forms of blood relationship.

Because of the small number of consanguineous marriages in the category of more distant cousin unions, it was difficult to undertake detailed comparative analysis by consanguinity status of the respondent. Consequently, for the examination of the association between consanguinity and education, occupational status and other socioeconomic variables, the data has been divided in two categories: women in consanguineous versus non-consanguineous marriages.

In terms of the correlates of consanguinity, the inverse expected association with consanguinity has been found for some of the explanatory variables, namely women's education, work before and after marriage, type of family and socioeconomic status of the household. The section to follow will discuss the impact of each predictor in explaining the variability in the dependent variable.

*****Table 2 about here*

Relatively, few Yemenis women have any formal schooling, with more than 80% of respondent being illiterate. It has been shown that women with only primary schooling are more likely to be in consanguineous unions than women with more advanced education, 45.5% versus 38.5 %, respectively (p< .001). This reflects the still prevailing practice among Arab parents to drop their daughters from school when the prospective groom becomes available. However, illiteracy is not found to be a significant predictor in explaining consanguinity. While the overall educational level of husbands is modestly higher, with 50.6% recording some form of schooling, for husband's education, the expected inverse relationship is not found. On the contrary, consanguineous unions have been found more prevalent among highly educated men (43.2%) than among their illiterate counterparts (36.2%).

In terms of the work status of respondents before marriage, it has been found that only a small percentage of women are engaged in paid work before their getting

married (about 5%). Even when it is difficult to assess the impact of this variable on consanguinity because of the small number of working women, still in general, it has been found that female occupational status prior to marriage is a significant determinant of whether unions are consanguineous, with women working for cash being less likely to be in consanguineous marriages. A similar statistically significant relation has been encountered between consanguinity and current occupational status, with self-employed women in the agricultural sector and white-collar workers being less likely to be in cousin marriages than their blue-collar or non-working counterparts (p< .01). On the other hand, an unexpected finding is the lack of inverse association between husband's occupation and consanguinity. It has been found that cousin unions are more prevalent among women whose husbands are engaged in the modern sector of the economy, particularly among blue-collar workers.

Contrary to findings based on earlier studies in the Arab world, while the incidence of consanguinity is higher in rural than urban areas, this association is not statistically significant (p< .05). Similarly, even when cousin marriages are more common in the southern-eastern governorate, still the difference is not significant. These two findings may perhaps be explained by looking at the socioeconomic characteristics of consanguineous and non-consanguineous households, which can be measured through both type of family and economic status. Couples living in nuclear households and with middle to high economic status have been found less likely to be in consanguineous marriages regardless of their place of residence.

****Figure 1 about here

Finally, there are higher percentages of women married at younger ages among those consanguineously married. For example, by looking at table 2, it is possible to notice that in the youngest age at marriage category, unions between cousins are more common than in the oldest marriage cohort, 40.8% and 38.4%, respectively. However, this difference has not been found statistically significant (p< .05). As for the trend in consanguinity in Yemen, in contrast to our expectations, there has been a rise in cousin marriages across the various marriage cohorts, with the increase being greatest for the last marriage cohort (*see figure* 1).

Multivariate Analysis

Results from the logistic regression show that there is a significant direct effect of the lowest level of education on increasing consanguinity (p< .05). As for the impact of female occupational roles in the monetarized sector before marriage, the effect is direct and statistically significant in lowering this practice by about 33% (p<.01). From these two results, it is obvious the impact of female highest level of education parallels the effect of women working for cash before marriage. The association of current occupational status with consanguinity is also direct and significant, with all categories of working women being less likely to be married to cousins than non-working women.

****Table 3 about here

The impact of husband's status on consanguinity is somehow peculiar. Corroborating findings in the bivariate analysis, the effect of husband's occupation on the response variable is both positive and statistically significant, with the prevalence of consanguineous marriages increasing for those in the formal sector of the economy, particularly among blue-collar workers. In fact, it has been found that being married to men working in blue-collar jobs increases the prevalence of consanguinity by about 22% (p< .01). As for men's education, the net impact is positive and significant, with highly educated men being 53% more likely to be married to cousins than men with no formal education (p< .0001).

As for respondent's rural-urban origin and geographical region, these are not significant predictors of consanguinity (perhaps, education, occupation and socioeconomic status of the household overlap heavily with these two predictors). On the other hand, type of family and economic status of the household have been found to have a positive and direct impact on consanguinity. In fact, the effect of living in an extended family, relative to a nuclear one, has been shown to increase the log odds of consanguineous marriages by about 12% (p< .05). As for the economic status, pertaining to a very high economic status, relative to a very low one, decreases the incidence of consanguinity by 33% (p< .0001).

Last but not least, by undertaking logistic regression it has been found that the impact of female age at first marriage is both direct and significant in explaining the variability in the dependent variable. Marrying at ages 19 and older (the oldest marriage cohort), relative to marrying at ages 14 and younger, decreases the log odds of being in a cousin marriage by 26%. As for the trend in consanguinity, results

indicate that the coefficient is positive and significant confirming as such that the incidence of consanguinity has increased over time in Yemen.

Discussion and Conclusion

In this study, the rate of consanguineous marriages is 39.9%. This is higher than in Egypt[3] (39%), Syria[13] (38%), Algeria[1] (36.4%), Kuwait[5] (36%), Bahrain[2] (32%), and Lebanon[6] (21%), but lower than in Tunisia[14] (40%), Qatar[10] (46%), Libya[7] (46.5%), the United Arab Emirates[15] (50.5%), Jordan[4] (51.3%), Oman[9] (54%), Saudi Arabia[11] (57.7%), Mauritania[8] (60.1%) and Sudan[12] (65%)[*]. In Yemen, first cousin marriages constitute the majority (33.3%), with paternal first cousin being more common. This is similar to other Arab countries where first cousin unions are more prevalent like in the cities of Riyadh (41.4%, Al-Hussein & Al-Bunyan, 1997) and Dammam (39.3%, Al- Abdulkareem, 1998) in Saudi Arabia, Oman (34%, Ministry of Health, 1996), Jordan (33%, Khoury and Massad, 1992), Kuwait (26%, Ministry of Health, 1996), Bahrain (23%, Ministry of Health, 1997) and Lebanon (18%, Ministry of Public Health, 1998). This reflects both prevailing religious and cultural practices in the region. Religiously, consanguinity is permissible in Islam since the Prophet Muhammad married two of his blood relatives and allowed his daughter to marry Ali, son of his uncle Abu Talib (Bittles, 1994). Culturally, Arab families have the tendency of consulting with paternal uncles before accepting the marriage of a daughter to a non-relative partner (Al-Gazali *et al*., 1997).

****Table 4 about here

From the analysis, it has been found that the higher the socioeconomic background of respondents in terms of educational attainment and occupational status before and after marriage, the lower the incidence of consanguineous marriages. This finding has also been found in several of the Arab countries, including Jordan (Khoury and Massad, 1992), Kuwait (Radovanovic, 1999), and countries of North Africa (Bittles, 1991). However, rural-urban origin though it has a direct impact on consanguinity, it is not statistically significant. Perhaps, educational and occupational statuses and characteristics of the household overlap with this variable. This means that despite living in urban areas, low socioeconomic profile of respondents contributes to maintaining traditional practices. The lack of statistically significant

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- References are given as footnotes in table 4.

difference in the prevalence of consanguinity by residence seems to be a finding unique for Yemen in the Arab world. In fact, studies in Egypt (National Population Council, 1996), Jordan (Khoury and Massad, 1992), Lebanon (Ministry of Public Health, 1998), Oman (Ministry of Health, 1996), and Tunisia (Ministry of Public Health, 1996) have demonstrated a higher propensity of unions among rural than urban inhabitants. For example, Khoury and Massad (1992) in Jordan have found that there are 29.8% first cousin marriages in urban areas, 30.9% in semi-urban areas and 37.9% in rural areas. Similar explanations can be given for the lack of significant association between geographical region and consanguinity.

However, a rather surprising finding is the lack of a negative impact of men's education on consanguinity. A plausible explanation is that since a son with higher education becomes a more valuable asset, his family may put a greater pressure on him to marry a cousin as a way to maintain family property (Givens and Hirschman, 1994). Khoury and Massad (1992) have found similarly that in Jordan the "best males are pressured to remain within the family". However, Al-Thakeb (1985) in Kuwait, Khlat (1988) in Lebanon and Saedi-Wong et al. (1989) in Saudi Arabia have found a negative relationship between husband's education and consanguinity. In terms of men's occupational status, the findings reveal a higher likelihood of cousin marriages for women married to men working in blue-collar occupations. Perhaps, men working in such occupations are more likely to exhibit low socioeconomic characteristics that are associated with increasing the practice of consanguinity.

Finally, age at marriage has been found to have a direct effect in lowering the prevalence of consanguineous marriages in Yemen. This may, in turn, provide further support to the hypothesis that the higher the social status of individuals, the lower the likelihood for kin marriages in a population. Therefore, legislative measures undertaken to influence female age at marriage may have an impact in lowering the prevalence of consanguinity among the Yemeni population.

Consanguineous marriages in Yemen have been on increase being in contrast to many other populations where this practice is falling. A similar rising trend has been reported in the United Arab Emirates (Al-Gazali *et al*., 1997). Khoury and Massad (1992), however, have reported a stable trend in consanguineous marriages in Jordan from 1900 to 1964. A stable trend in the prevalence of cousin unions has also been reported in Oman (Ministry of Health, 1996). A declining trend, on the other hand, has been documented in Bahrain (Ministry of Health, 1996), Lebanon (Ministry of Public Health, 1998), Kuwait (Ministry of Health, 1996) and Syria (Central Bureau

of Statistics, 1995). As for the other countries in the Arab region, the time trend in consanguinity is largely unknown.

In Yemen, the reason for the rising trend in consanguinity can be attributed to the increase in the availability of cousins due to high fertility coupled with the low socioeconomic characteristics of individuals. However, to provide a more complete picture of the social and cultural forces behind this increasing trend, further studies are needed that are more qualitative in nature. In addition, more comparative data are needed to assess whether this trend in Yemen is unusual with respect to other Arab countries.

In conclusion, given the significant prevalence of consanguinity in Yemen, in-depth and specialized demographic studies on this practice should be undertaken to assess better the related variables of such unions. Moreover, it may be of interest to examine the validity of the hypotheses that consanguineous couples have both higher fertility levels and higher infant and child mortality. Such information may be very opportune now. This is so because as the incidence of environmental diseases is falling in most of the developing countries, the likelihood of biological diseases mostly of genetic origin is expected to rise, especially in populations where the practice of inbred marriages is high. Normally, however, such studies necessitate specialized surveys that allow the researcher(s) to distinguish between causes of death among infants. In this way, it may be possible to determine accurately the relationship between consanguinity and genetic diseases.

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Tables

Table 1: Prevalence of Consanguineous Marriages in Yemen

Relationship	DHS 1991/92		DHS 1997	
	Number	**Prevalence %**	**Number**	**Prevalence %**
Consanguineous				
1st. cousin: father	1253	22.1	2323	23.9
1st. cousin: mother	508	9	913	9.4
Distant	297	5.2	643	6.6
Non-consanguineous	3610	63.7	5847	60.1
Total	5668	100	9726	100

Table 2. Correlates of Consanguineous Marriages In Yemen

Characteristics	Non-consanguineous (n= 3879) %	Consanguineous (n= 5847) %
Education of the respondent[3]		
Illiterate	61.0	39.0
Primary	54.5	45.5
Secondary	60.1	39.9
Higher	61.5	38.5
Education of the husband[3]		
Illiterate	63.8	36.2
Primary	58.9	41.1
Secondary	55.3	44.7
Higher	56.8	43.2
Place of residence		
Urban	61.2	38.8
Rural	59.7	40.3
Geographic region		
North & West Region	60.4	39.6
South & East Region	59.4	40.6
Worked before marriage[2]		
No	59.2	40.8
Yes- For Cash	68.0	32.0
Yes- For Free	61.4	38.6
Current type of occupation[1]		
Housewife	59.1	40.9
Agriculture	62.8	37.2
Blue collar	60.7	39.3
White collar	62.3	37.7
Occupation of the husband[3]		
Agriculture	62.6	37.4
Blue collar	58.0	42.0
White collar	59.1	40.9
Don't work	64.4	35.6
Type of family[2]		
Nuclear	61.5	38.5
Extended	58.0	42.0
Joint	63.8	36.2
Extended-Joint	56.2	43.8
Other	57.1	42.9
Age at first marriage		
14 and younger	59.2	40.8
15-16	59.9	40.1
17-18	60.3	39.7
19 and older	61.6	38.4
Socioeconomic status[3]		
Lowest	55.8	44.2
Low middle class	61.0	39.0
High middle class	61.7	38.3
Highest	60.3	39.7
Total	39.9	60.1

[1]Statistically significant at $p < 0.05$ using the chi square (X^2) test

[2]Statistically significant at $p < 0.01$ using the chi square (X^2) test

[3]Statistically significant at $p < 0.001$ using the chi square (X^2) test

**Table 3. Logistic Regression Coefficients Giving Extent of the Effects
of Selected Correlates on Consanguinity**

Variable	Coefficient	Odds Ratio	P
Education of the respondent			
Illiterate			
Primary	0.1476	1.1590	0.0327
Secondary	-0.0190	0.9812	0.8388
Higher	0.0677	1.0701	0.7656
Education of the husband			
Illiterate			
Primary	0.2061	1.2289	0.0007
Secondary	0.4189	1.5202	0.0000
Higher	0.4267	1.5322	0.0000
Place of residence			
Urban			
Rural	0.0877	1.0917	0.1640
Geographic region			
Northern and Western			
Southern and Eastern	-0.0040	0.9960	0.9428
Worked before marriage			
No			
Yes- For Cash	-0.3941	0.6743	0.0060
Yes- For Free	0.0266	1.0269	0.6710
Current type of occupation			
Housewife			
Agriculture	-0.1590	0.8530	0.0223
Blue collar	-0.1314	0.8768	0.3988
White collar	0.0650	1.0672	0.6508
Occupation of the husband			
Agriculture			
Blue collar	0.2005	1.2220	0.0021
White collar	0.0789	1.0821	0.1868
Don't work	-0.1568	0.8549	0.0908
Type of family			
Nuclear			
Extended	0.1074	1.1134	0.0381
Joint	-0.1256	0.8820	0.4168
Extended-Joint	0.1724	1.1881	0.0155
Other	0.0661	1.0683	0.8885
Age at first marriage			
14 and younger			
15-16	-0.1154	0.8910	0.0359
17-18	-0.1582	0.8537	0.0160
19 and older	-0.1758	0.8388	0.0091
Socioeconomic status			
Lowest			
Low middle class	-0.2841	0.7527	0.0000
High middle class	-0.3627	0.6958	0.0000
Highest	-0.4037	0.6678	0.0000
Constant	-0.3542		0.0002

Table 4. Prevalence of Consanguineous Marriages in Selected Arab Countries

Country	Consanguinity Prevalence %	Year
Algeria[1]	36.4	1994
Bahrain[2]	32.0	1995
Egypt[3]	39.0	1996
Jordan[4]	51.3	1992
Kuwait[5]	36.0	1996
Lebanon[6]	21.0	1998
Libya (Jamahiria)[7]	46.5	1996
Mauritania[8]	60.1	1992
Oman[9]	54.0	1996
Qatar[10]	46.0	1999
Saudi Arabia[11]	57.7	1995
Sudan[12]	65.0	1995
Syria[13]	38.0	1995
Tunisia[14]	40.0	1996
United Arab Emirates[15]	50.5	1997

[1]Algerian National Statistics Office, 1994

[2]Ministry of Health, 1997

[3]National Population Council, 1996

[4]Khoury & Massad, 1992

[5]Ministry of Health, 1996

[6]Ministry of Public Health, 1998

[7]General People's Committee for Health and Social Insurance , 1996

[8]National Statistical Office, 1992

[9]Ministry of Health, 1996

[10]Ministry of Health, 1999

[11]El Hamzi *et al*., 1995

[12]Federal Ministry of Health and the National Center of Health Statistics , 1995

[13]Central Bureau of Statistics, 1995

[14]Ministry of Public Health , 1996

[15]Al-Gazali *et al*., 1997

Figure 1. Trend in Consanguineous Marriages in Yemen by Respondent's Marriage Cohort