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CAUSES OF DEATH TO WOMEN
OF REPRODUCTIVE AGE IN EGYPT

by

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Abstract: This paper describes research undertaken to determine the relative mortality due to reproductive causes and nonreproductive causes in a developing country. Preliminary data on 1135 deaths to married women 15 to 50 years of age in the governorate of Menoufia, Egypt, during 1981 and part of 1982 are described. Causes of death were diagnosed by a Medical Panel from data collected by nonmedically trained persons who interviewed the families of the deceased. Preliminary analysis suggests that the practice of contraception in a developing country is safer than the alternative.

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CAUSES OF DEATH TO WOMEN OF REPRODUCTIVE AGE IN EGYPT

Introduction

The publication in 1976 of Tietze and his colleagues' article on the mortality associated with the control of fertility (Tietze et al., 1976), and the recent article by Sachs and his colleagues on reproductive mortality in the United States (Sachs et al., 1982) are especially important milestones in the assessment of the safety of contraception in the developed world. The findings for these studies, however, cannot be extrapolated to developing countries. There are many important differences between developed and developing countries which affect contraceptive decisions including availability of medical care (particularly maternity services), level of infant mortality, and alternative careers for women.

In assessing the risk-benefit ratio of contraception, the advantages and disadvantages of the contraceptive method used as well as the disadvantages of pregnancy must be considered. Probably the most important component of the risk-benefit ratio is maternal mortality which in many developing countries is very high. Although rates are difficult to obtain, it has been estimated that Bangladesh, for example, has a maternal mortality rate approximately 40 times that of the United States (Potts, 1983). Tietze showed that barrier contraception with early abortion back-up is the safest form of fertility control in the United States. In many developing countries, legal (and therefore safe) abortion is not available; consequently mortality from illegal abortion is often high (though underreported). Thus, in a risk/benefit analysis of contraception, the pregnancy side of the equation carries much higher risks within the developing world.

On the other side of the equation, contraception may also carry higher risks, although this is less clear and may vary with method of contraception. With respect to oral contraception, some of the risk factors associated with oral contraception in Western women (obesity and smoking) are far less common among women in developing countries; on the other hand, oral contraceptives are distributed with less medical supervision in many cases. In the case of intrauterine contraception, the major life-threatening risk is ectopic pregnancy which is more likely to be fatal in a developing country for a variety of reasons. Further complicating the issue is the fact that countries where the mortality is highest are often those where it is least accurately reported (if reported at all), both in terms of the number of deaths (percent registered) and the cause of death.

The research described here was designed to address these unanswered questions.

How can the relative risks and benefits of contraceptive use be best evaluated?

2. How do the long-term side effects of contraceptive methods in developed countries compare with those in developing countries?
3. What are the major causes of mortality to women of reproductive age in areas where medical care is scarce?

The design is an original one in which causes of death to married women of reproductive age are determined from data collected by nonmedically trained persons who interview the families of the deceased. To our knowledge, this method has been tried rarely, if ever. The research was undertaken at two sites, one in Indonesia and one in Egypt; this paper reports on the data from Egypt. Included in this report are 1135 deaths from 1981 and part of 1982. The purpose of the research is to determine the relative incidence of deaths due to reproductive causes and nonreproductive causes.

There is a wealth of literature describing the validity of cause of death diagnoses made by clinical assessment only (i.e., without benefit of autopsy). In this project, despite the fact that almost no autopsies were done, various factors are operating in our favor because of the age of the decedents.

1. A significant part of the difficulty in making diagnoses lies in differentiating between multiple causes. This problem is reduced when young people are the decedents; they are less likely than elderly people to have more than one disease.
2. The age of our decedents (15 to 50 years) is also to our advantage in that, unlike infants and children, they are articulate and tend to communicate their symptoms to family members or to medical care providers.
3. Major causes of death in this age group are trauma and maternal deaths, each of which presents few diagnostic difficulties.
4. We are looking at rather broad categories of disease. For example, we wish to determine whether a death is due to heart disease in general, rather than in distinguishing between ischemic or rheumatic heart disease. Although we do look at specific causes of death, our conclusions are drawn from the broad categories.

RESEARCH METHODS

Deaths to married women aged 15 to 50 years in the governorate of Menoufia in the Nile delta were located through the vital registration system. The total population of the governorate is 1.7 million. Vital registration is reasonably good in Egypt (NRC, 1982), and deaths are less likely to go unregistered in this age group than among the very young or the very old. In the two years for which we are presenting data (the study is presently in its third and final year of data collection) only one unregistered death was found.

Fifty was used in preference to 49 for the upper limit of the age group because of substantial age heaping in this population. Several deaths were registered as being in the appropriate age group, but were found at interview to be older than 50 years.

Registered deaths were identified on a monthly basis and assigned to interviewers according to the county of residence of the deceased. The governorate has eight counties, one of which contains a reasonably large town. Initially interviewers waited until the end of the traditional 40-day mourning period to call on the family of the dead woman, but soon discovered that this was not necessary; the average interval between death and interview was 30 to 40 days. The husband was the most likely person to be interviewed (43%), but in 43% of cases more than one person participated in the interview. Where possible, data were also collected from hospitals and health centers where the deceased had been treated.

In addition to background data on a variety of socioeconomic variables, a series of questions were asked about specific symptoms including pregnancy status. Interviewers also asked to see (and were usually permitted to keep) unused medicines, prescriptions, care instructions, and X-rays.

After being checked for completeness, the interview schedules were given to a Medical Panel for diagnosis. The Medical Panel consisted of five local physicians: an obstetrician-gynecologist, an internist, a pathologist, a specialist in infectious diseases, and the Director of Family Planning of the Governorate Department of Health. Members of the Panel individually made tentative diagnoses of the causes of death; then at biweekly meetings the diagnoses were discussed and confirmed. Some cases generated a great deal of discussion; others required almost none.

It should be remembered that the diagnoses were made by physicians who had no contact with the deceased, although they did on occasion have access to clinical records. Autopsies are rare in this population, mainly for religious reasons, and are done only when the police are involved in investigation of the death (homicides, suicides and traffic accidents for the most part).

Because we were looking specifically for deaths attributable to reproduction, the members of the Panel were intended to be kept blind as to the contraceptive status of the deceased. The Panel did not conform to this part of the protocol in the early part of the study (although only the Ob/Gyn paid much attention to contraception). For this reason all deaths to women using contraception are being re-diagnosed.

Reliability

A ten percent random sample was re-diagnosed by the Medical Panel to assess the reliability of the diagnoses. Fifty-six percent had an identical diagnosis at both times, and a majority of the remaining 44% remained in the same broad disease category. The data in Figure 1 and Table 1 describe the

discrepancies that were found. A common source of error was a reordering of underlying and contributing causes (both in cases where the major disease category changed and those in which it remained the same).

A comparison of the marginals in Table 1 shows that there is very little difference in the overall effect of changes in diagnosis, even in those categories that are least stable. The largest difference is in disease of the circulatory system which increases slightly from 33% of all deaths at the first diagnosis to 36% of all deaths at the repeat diagnosis. The most stable categories, as expected, are trauma, cancer and pregnancy-related deaths.

Continuing assessment of the quality of the cause of death diagnosis will include blind rediagnosis by a different group of physicians in Egypt, and rediagnosis by a group of physicians in the United States. It is anticipated that Egyptian physicians will overdiagnose diseases endemic to Egypt, and American physicians will underdiagnose diseases endemic to Egypt. It does not appear possible, however, to estimate the extent to which this will occur.

METHODOLOGICAL PROBLEMS

A variety of problems were anticipated, many of which were not realized. Other problems developed that were anticipated less clearly.

1. Data Collection

- a. Coverage: Deaths are located through the official death registration system. Although initially a matter of concern, death registration appears to be relatively complete.
- b. Respondent cooperation: Only 2 refusals have occurred out of the 1210 families contacted in 1981 and 1982.
- c. Information provided by the families: Initially there was considerable concern that the survivors would not be familiar with the symptoms experienced by the deceased, or that they would agree to the presence of every symptom mentioned. This concern appears to have been unfounded and, generally speaking, the combination of symptoms described makes clinical sense. Since the interviews can be with several family members at the same time, there is sometimes disagreement about the duration of a symptom, but rarely about its existence. Complete lack of knowledge about the presence of a symptom is rare, and the only question asked that frequently produces a "don't know" response is for the date of the last menstrual period.
- d. Age reporting: As expected there is considerable age heaping. Ages ending in 0 or 5 are reported by 51% of the cases. No doubt this problem is exaggerated because age is necessarily reported by survivors

rather than the women themselves. The unconventional age range (15 to 50) was chosen so that those 48 and 49 years old would be less likely to be incorrectly excluded. There also appears to be a deficit in deaths at ages 40 to 44 and a smaller deficit at 30 to 34.

2. Diagnosis

It was anticipated that a proportion of cases would present unlikely or confusing combinations of symptoms so that the Medical Panel would be unable to make a diagnosis. This proved to be the case only rarely. Further, although only 26% of these women died in a hospital, 87% had had contact with the health care system and the diagnoses of the attending physicians were often available. Obviously some diagnoses are made with a greater degree of confidence than others. There is generally no question at all about traumatic deaths; questions about maternal deaths relate to whether the death is directly or indirectly related to the pregnancy, not to whether it is a maternal death. Similarly, there is little question about deaths due to cancer. The more specific the cause of death, the greater the degree of uncertainty. We are analyzing both specific causes and the causes by broad category of disease, and both are presented here. Obviously one has greater faith in the broad disease categories.

It is extremely difficult to evaluate the quality of the cause of death diagnoses. The Medical Panel are probably in a better position than any group of physicians other than the attending physicians to make the determination since they are familiar with local conditions. Nevertheless, there is probably a tendency to overdiagnose common diseases which in turn increases their prevalence and further increases the tendency to diagnose the disease. Physicians who are more removed from the situation would not share this tendency, but it is difficult to know which group would be closer to the truth.

3. Coding

Here we refer to the coding of the cause of death. All other coding was done in the field by specially trained coders.

In coding the causes of death a modification of the 9th Revision ICD Mortality List of 50 Causes was used. Modifications included limitation to two digit codes, the elimination of certain diseases (diseases of childhood, diseases limited to males, and extinct diseases), the expansion of maternal causes, and the addition of an "other" category to each broad category of disease.

In general the ICD rules for classification were followed so far as is possible with the short list. The most serious restriction of the short list with respect to these rules occurred when hypertension, heart failure, and renal failure were simultaneously present. There is a preferred four digit code for this condition, but three two-digit codes were used to describe the condition in this study.

In the case of maternal deaths (i.e., decedent was pregnant or recently pregnant), the first code assigned is always one of the following four: direct obstetric, indirect obstetric, nonobstetric maternal, or abortion related. The actual cause (e.g., hemorrhage, sepsis, eclampsia) is always coded second or later.

Perhaps the most serious problem with the coding (as with the original assignment of cause) lies in determining the first code, the underlying cause. Almost always the determination of the Medical Panel was followed. The most important exception was "heart failure" which was not coded first if another appropriate cause was given.

4. Missing Denominators

Accurate estimates of the following important denominators are not presently available.

- a. The number of married women of reproductive age. What is available (from the Central Agency for Public Mobilization and Statistics) is an unsatisfactory projection from the most recent census (1976) of the total number of women (married and single) by 5-year age intervals. Comparable data from the 1966 census is being sought with which to make new projections. In the meantime, we have made a projection of the 1981 population of women aged 15-49 by interpolating the 1976 census of population for Menoufia and national statistics. Two projections have been made, one using age specific mortality rates and the other census survival rates. The two projections are remarkably close and the second is used.
- b. The number of births for each year of the study by age of mother. Egyptian birth certificates do not contain mother's age. These data are estimated from age specific fertility rates for the country as a whole.
- c. The number of contraceptors and the number of noncontraceptors. Although the number of contraceptors is theoretically available from clinic statistics, the statistics are thought to contain large errors.

A survey conducted in 1977 (Gadalla et al) showed that 28% of married, fecund women aged 15-44 were contracepting (after improvements in availability of contraceptives). For the purposes of this research we are assuming that 20% of all women aged 15-50 are contracepting, but calculations will also be based on other assumptions.

RESULTS

A presentation of the results should begin with a discussion of the age specific death rates. Because of both numerator and denominator problems mentioned earlier, however, these calculations are not as simple as we might have wished. A variety of approximations were made, and the rates shown below are considered our best estimate at present.

AGE	DEATH RATE PER 1000 WOMEN
15-19	2.15
20-24	1.49
25-29	1.90
30-34	1.90
35-39	2.57
40-44	2.18
45-49	3.59
Total	2.17

The numerator used in this calculation is the number of currently married women dying in the given age group. The reported ages have been smoothed, although the deficits at 30-34 and 40-44 are still apparent.

The denominators are projections of the population (neither midyear nor beginning year) of Menoufia for 1981 using the 1976 population reported by the census and projected to 1981 using the same survival proportions that pertained from 1966 to 1976 for the whole of Egypt. The resulting population of women is then reduced by the proportion not currently married as reported for Menoufia in the 1976 census. The death rate at 15-19 is probably too high due to an underestimate of the proportion married at this age (17.7%) which reduces the size of the denominator.

Cause of Death

The following section refers primarily to the underlying cause of death, that is, the cause designated by the Medical Panel as the main cause of death, although this was often not the immediate cause of death. In most cases the underlying cause is clear (as, for example, in cases of trauma, diseases of pregnancy, childbirth and the puerperium, malignant neoplasms, and most infections). It is less clear when the deceased had several disorders at the time of death, and several systems were involved. This is most often the case when heart disease/failure, liver disease/failure, renal disease/failure, diabetes mellitus, and respiratory conditions are mentioned. Thus, figures relating to the first group of conditions should be regarded as more reliable than figures relating to the second group of conditions.

The leading cause of death to women of reproductive age in Menoufia is diseases of the circulatory system, accounting for 31% of all deaths (26% if the cardiopulmonary deaths are assigned to diseases of the respiratory system instead of to diseases of the circulatory system). Among the diseases of the circulatory system, rheumatic fever and rheumatic heart disease (almost entirely the latter) accounted for the largest part (9% of the total). Rheumatic heart disease was a contributing factor in another 4% of cases. The second largest category within the broad category of circulatory diseases was the category of other heart diseases, including the ill-defined designation of heart failure. This accounted for 8% of the total deaths.

The next largest category is disorders of pregnancy and childbirth and the puerperium. This accounted for 24% of all deaths (or 21% when the nonobstetric maternal deaths are removed). The majority of these were direct obstetric deaths (13%) rather than indirect (7%), and only 1% were attributed to abortion. The causes of the maternal deaths will be discussed later.

The third largest category of deaths was trauma (13% of the total), and more than half of these (7%) were burns. No other category of disease accounted for more than 10% of deaths. The distribution by broad categories of disease is shown in Table 2.

Maternal Mortality Rates

Deaths associated with pregnancy or childbirth accounted for 21% of all deaths (or 24% if death to pregnant women that were not due to obstetric causes are included). In addition to accounting for a large percentage of all deaths, the age specific rates per 1000 live births are quite high:

AGE	DEATHS PER 1000 LIVE BIRTHS
15-19	8.94
20-24	1.80
25-29	1.88
30-34	2.24
35-39	3.98
40-44	3.94
45-49	4.11
TOTAL	2.63

This is 16 times higher than the rate in the U.S. (1973) which was 0.16 per 1000 live births. The high rate for the youngest women is probably due both to an increased risk of childbearing in very young women as well as to an underestimate of the age specific fertility rate used in projecting the number of births (Demographic Yearbook 1980, fertility rates are for 1976). This underestimate would decrease the denominator (number of births).

Deaths associated with pregnancy and childbirth were divided into four broad categories: deaths due to abortion (spontaneous or induced), direct obstetric deaths, indirect obstetric deaths, and nonobstetric maternal deaths. The relative distribution of these was provided earlier.

Among the direct obstetric deaths hemorrhage (antepartum or postpartum) was the single most common cause of death (54%), with sepsis a distant second (16%). The third cause of the classic trio, eclampsia, accounted for only 10% of the direct obstetric deaths.

Only two deaths were attributed to ectopic pregnancies, but this condition is often difficult to diagnose; it is possible that some cases reported only as acute abdomen were in fact ectopic pregnancies. All other causes contributed only one to two cases: they include tetanus, probable thromboembolism, and homicide (since the homicide was because of the premarital pregnancy it is coded as a direct obstetric death rather than a nonobstetric maternal death). In some cases the cause was not known, but because of its timing in relation to delivery, it is considered a direct obstetric death. Seven percent of the deaths involved a cesarean section, but the indication for the cesarean was not always known.

Among the indirect obstetric deaths the leading cause of death was rheumatic heart disease (26%) with a variety of other diseases of the circulatory system also playing important roles (30%). Other causes include infectious diseases, cancer, nongestational diabetes, liver disease, kidney disease, and suicide. Cardiovascular diseases also account for a major proportion of deaths to nonpregnant women, and the increased strain placed on a diseased heart by pregnancy is clearly shown by these data.

There were few abortion deaths located in this research. Abortion is illegal in Egypt and only in obvious cases is the Medical Panel ready to attribute the death to illegal abortion. Occasional cases were clearly spontaneous abortions. One death was attributed to rheumatic heart disease and another to kidney disease. In both cases the spontaneous abortion occurred during the final episode of the disease. But in most cases the etiology of the abortion is not clear. Hemorrhage was the most common cause of abortion death, followed by sepsis.

Trauma predominates (53%) among the nonobstetric maternal deaths. Other causes include a variety of acute and chronic diseases which were not considered to have been aggravated by the pregnancy. One woman died during an appendectomy.

The analysis described here has focussed on causes of death. Analysis of cause by contraceptive status has only just begun and is still limited by the nonblindness of the diagnoses with respect to contraceptive status. This is presently being corrected. Despite this deficiency, some important findings emerge. First, only 8% of the women who died were contracepting at the time of death, and contraceptors were on the average 3 years older than noncontraceptors. Since the prevalence of contraception among the population of women in general is probably at least 20%, this fact alone is important.

Second, disease categories for which contraceptors and noncontraceptors were disproportionately represented were few and predictable. Complications of pregnancy and childbirth, of course, included only noncontraceptors. Consistent with findings from developed countries, contraceptors were over-represented among women dying from diseases of the circulatory system, and the findings for specific diseases within this group are also consistent with research findings from developed countries. Note that these findings have not been age-standardized.

When denominator information (numbers of contraceptors and noncontraceptors) becomes available, rates of death from specific causes (standardized for age) will be calculated, but this is not possible at present.

CONCLUSION

Two important, and entirely unrelated, conclusions can be drawn from this analysis. First, it appears that despite less than optimal medical supervision, the practice of contraception in a developing country is safer than the alternative. Twenty-one percent of all deaths were associated with pregnancy or childbirth. Major causes of maternal mortality among these women--who were largely outside the modern system of obstetric care--were hemorrhage, sepsis, and eclampsia. While contraception also carries a risk, that risk is extremely small when compared with risk of childbirth.

Given the high prevalence of heart disease in this population, family planning services in the area should perhaps consider increasing their emphasis on intrauterine contraception. At the present time, oral contraception is by far the most common method, and pills are normally distributed without medical supervision. While there are no cardiovascular deaths that can definitely be attributed to pills, it is worth remembering that IUDs carry no increased risk among women with heart disease.

Second, despite a multitude of logistic and methodological problems it is possible to undertake this kind of research in a developing country and to achieve useful results. This kind of concentrated small area research can provide useful data to complement official, recorded mortality statistics. In addition to answering specific questions that cannot be answered by vital registration data, it can serve to evaluate the quality of

the vital registration data. Although it snares many of the same problems (e.g., diagnosis difficulties, age misrecordings) with vital registration, in this kind of research these problems are easier to control (but not necessarily to quantify).

FIGURE 1. Examples of Discrepancies

Discrepancies Remaining in the Same Broad Category of Disease

1. First diagnosis assigned the cause of death to rheumatic heart disease shortly after delivery (coded as indirect obstetric cause and rheumatic heart disease). The repeat diagnosis attributed death to a pulmonary embolus (coded as a direct obstetric death and thromboembolic disorder). The first code in both cases remains in the category of diseases of pregnancy, childbirth and the puerperium, and the second code in both cases remains in the broad category of diseases of the circulatory system. (008 0007).

2. Death was attributed to diabetes in both instances, and hypertension was mentioned in both the original and the repeat diagnoses. However, in the first diagnosis heart failure was mentioned and the second a chest infection was mentioned. Furthermore the order of the contributing causes varied. (002 0047)

3. The first diagnosis attributed death to renal failure (uremia). The second, more complete, assessment also attributed death to renal failure, but also mentioned hypertension and diabetes as contributing causes. (001 0024)

Discrepancies Resulting in Assignment to Different Broad Category of Disease

1. First diagnosis assigned the cause of death to a chest infection and mentioned that the deceased also had typhoid fever. The second assessment did not mention the chest infection. Assignment of cause of death moved from Diseases of the Respiratory System to Infectious Diseases. (003 0057)

2. First diagnosis assigned the cause of death to heart failure due to hypertension; renal failure was mentioned as a contributing cause. The second assessment reversed the order and attributed death to renal failure due to hypertension. (004 0050)

3. The first diagnosis attributed death to liver failure (mentioned that the deceased had a cholecystectomy 6 months before death). The second assessment mentioned the cholecystectomy, but considered the cause of death to be unknown. (006 0004)

Table 1. Comparison of Original and Repeat Diagnoses of Cause of Death in a Random Sample of Cases Selected for Repeat Diagnosis; Menoufia, Egypt (N = 70)

REPEAT DIAGNOSIS	Infectious Diseases	Cancer	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Genito-Urinary System	Diseases of Pregnancy	Trauma	Miscellaneous*	Other	Unknown	ORIGINAL DIAGNOSES	
												Total N	%
Infectious Diseases	<u>5+1</u>			1								7	10.0
Cancer		<u>3</u>										3	4.3
Diseases of Circulatory System	1		<u>10+12</u>									1	1.4
Diseases of Respiratory System												1	1.4
Diseases of Digestive System	1				<u>1</u>							2	2.9
Diseases of Genito-Urinary System			1			<u>3+2</u>						6	8.6
Diseases of Pregnancy							<u>2+6</u>					8	11.4
Trauma								<u>13</u>				13	18.6
Miscellaneous*									<u>1+2</u>			3	4.3
Other											<u>1</u>	1	1.4
Unknown					1							1	1.4
Total N	8	3	23	1	2	5	8	12	6	1	0	70	100.0
%	11.4	4.3	32.9	1.4	2.9	7.1	11.4	18.6	8.6	1.4	0.0		100.0

*Primarily diabetes mellitus

NOTE: Where there are two numbers in the diagonal cells (e.g., 10+12) the first number refers to cases where assigned codes were identical, the second number refers to cases where the first code (underlying cause) was identical but the second and/or third codes (contributing causes) were different, or in different order, or cases in which the first code is different but in the same category of disease.

Table 2. Cause of death (11 broad categories of disease) by age of decedent, 1145 married women of reproductive age, Menoufia, Egypt, 1981-1982. (Cell values are absolute numbers)

Cause of death	15-19	20-24	25-29	30-34	35-39	40-44	45-50	UK	Total	
									n	%
1. Infectious and parasitic diseases	--	7	10	10	14	9	24	4	78	6.9
2. Malignant neoplasms	1	5	10	11	13	16	28	1	85	7.4
3. Diseases of the circulatory system	6	19	40	27	50	50	148	14	354	31.2
4. Diseases of the respiratory system	1	--	1	2	4	5	13	3	29	2.6
5. Diseases of the digestive system	1	5	5	4	9	5	28	4	61	5.4
6. Complications of pregnancy, childbirth and puerperium	20	47	63	45	54	20	14	8	271	23.8
7. Diseases of the genito-urinary system	--	6	2	3	6	5	13	3	38	3.3
8. Trauma	10	23	25	15	16	13	28	13	143	12.6
9. Miscellaneous diseases	--	1	3	6	4	3	18	2	37	3.3
10. All other causes	--	--	--	--	--	1	--	--	1	0.1
11. Unknown cause or symptoms only	1	6	3	3	6	9	10	--	38	3.3
Total										
%	3.5	10.5	14.3	11.1	15.5	12.0	28.5	4.6	100.0	
N	40	119	162	126	176	136	324	52	1135	

REFERENCES

1. Gadalla, S., Nosseir, N., and Gillespie, D. G.
1980 Household Distribution of Contraceptives in Rural Egypt. Studies in Family Planning 11(3): 105-113.
2. National Research Council
1982 The Estimation of Recent Trends of Fertility and Mortality in Egypt. Washington, D.C.: National Academy Press.
3. Potts, D. M.
1983 Personal Communication.
4. Sachs, B. P., Layde, P. M., Rudin, G. L., and RoCHAT, R. W.
1982 Reproductive Mortality in the United States. JAMA 247: 2789.
5. Tietze, C., Bongaarts, J., and Snearer, B.
1976 Mortality Associated with the Control of Fertility. Family Planning Perspectives 8(1): 6-14.

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