A SUMMARY OF DATA ON REPORTED INCIDENCE OF ABORTION[1]

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THE problem of abortion is one which has received increasing and widespread attention in recent years. It is an important problem because the maternal deaths associated with previable terminations of pregnancy have been revealed by various studies as an important part of the maternal death rate and also because loss of foetal life before the period of viability is a much more frequent type of pregnancy wastage than stillbirths. Nevertheless, reliable data on the frequency of abortions are very limited and most of the data made available by special investigations refer to selected population groups and are not applicable to the general population. In a recent article,[2] data were presented on the outcome of 1,525 pregnancies experienced by an unselected sample of 595 married women in New York City. In the present report, data from various sources are assembled in order to review the general indications concerning the incidence of abortion, both spontaneous and induced.

The extent to which deaths associated with the termination of pregnancy before the foetus is viable contribute to the total maternity mortality, is shown in Table 1 for New York City, fifteen states, and for Scotland. Death of the mother occurred before the seventh month of pregnancy in 27 per cent of the cases in New York City and in 32 per cent of the cases in fifteen states which were studied by the Children's Bureau. Both of these studies indicate that death in this early period was more frequent in the United States than in Scotland, where only 21 per cent of the deaths occurred before the last trimester of pregnancy. The significance of these differences in proportional mortality is not easily determined. Such data reveal

[1] From the Milbank Memorial Fund.

[2] Wiehl, Dorothy G. and Berry, Katharine: Pregnancy Wastage in New York City. The Milbank Memorial Fund *Quarterly*, July, 1937, xv, No. 3, pp. 229–247.

the importance of conditions resulting in non-viable terminations as a cause of maternal mortality, but, since there are no data to indicate the frequency of such terminations, the extent of the risk to life for pregnant mothers during this period is not known. The death rate among women who experience an abortion may be higher or lower than for other types of births, and the rate may vary greatly from one area to another.

There are obvious difficulties involved in obtaining complete reports on early pregnancy terminations, especially illegal abortions. From clients of birth control clinics detailed histories of pregnancies have been obtained, and it seems likely that these women have given complete and truthful statements of pregnancies experienced and type of termination. The results of these studies have provided the principal data to support the very high estimates made for the number of illegal abortions in the population at large. But these women are not representative of the general population since they are selected on the basis of their interest in family limitation, and possibly are more fertile than an unselected sample.

Table 1. Maternal deaths at various periods of uterogestation in New York City, in fifteen states and in Scotland.

Period of Uterogestation	Per Cent of Total Deaths			Number of Deaths[1]		
	New York City[1]	Fifteen States[2]	Scotland[3]	New York City 1930–1932	Fifteen States 1927–1928	Scotland 1929–1932
Total Deaths	100.0	100.0	100.0	2,041	7,346*	2,465
9th Month or 37+ Weeks	57.2	67.6	59.8	1,168	4,965	1,473
7-8 Months or 28–36 Weeks	15.5		18.8	317		463
Less Than 7 Months or 28 Weeks	27.3	32.4	21.4	556	2,381	529
14–27 Weeks	8.9	9.1	9.4	182	672	233
Less Than 14 Weeks	17.0	17.7	12.0	346	1,299	296
Not Reported	1.4	5.6	0	28	410	0

* Excludes thirty-four deaths for which the period of gestation was unknown.

[1] Hooker, Ransom S.: MATERNAL MORTALITY IN NEW YORK CITY. New York Academy of Medicine. New York, 1933. The Commonwealth Fund.

[2] Maternal Mortality in Fifteen States. Children's Bureau Publication, No. 223. U. S. Government Printing Office, 1934.

[3] Douglas, Charlotte A. and McKinley, Peter L.: MATERNAL MORBIDITY AND MORTALITY IN SCOTLAND. Edinburgh, His Majesty's Stationery Office, 1935.

Two other types of studies have furnished data for more typical populations; these are: (1) morbidity surveys in which the same families are visited at intervals over a period of one or more years, since an abortion or miscarriage results in some illness or a short period of disability, and (2) detailed histories of the termination of previous pregnancies experienced by women who have had a birth registered, are currently in a hospital for delivery, or have reported a recent pregnancy when visited in connection with a morbidity survey. A current or recent pregnancy affords a basis for questioning and assists in obtaining the interest and cooperation of the informant. However, registered births or current hospital deliveries will include relatively few non-viable terminations and only the record for *previous* pregnancies should be used for determining the frequency of abortions. Since there is probably some tendency for women to have repeated abortions, the previous history of women having a current viable birth no doubt gives a minimum rate for non-viable terminations. Furthermore, the histories of previous pregnancies in these studies are obtained from living women which also tends to make the record of previous abortions a minimum. Records of abortions obtained from morbidity surveys are not subject to these selections and have the further advantage that they represent incidence within a specific period of time. Although no special emphasis was placed on obtaining a record of abortions and miscarriages in the morbidity surveys from which data are used in this report, questions were asked concerning any cause of illness or disability, and concerning any medical care received during a period of three or four months. Since other intimate and personal information was told to the investigators, we may assume that the record of abortions is approximately complete.

Frequency of Abortion. The extent of pregnancy wastage[3] reported by women on personal interview is shown in Table 2 for

[3] Pregnancy wastage is a term adopted by a number of writers to include stillbirths and all previable terminations and will be used in this sense in this report. Abortion is used to include all terminations before the seventh month of pregnancy.

groups of women in various areas of the United States. In this table, there is presented data taken from a number of published reports, some unpublished data from surveys made by the Milbank Fund, and unpublished data from a morbidity survey of 9,000 families in eighteen states, which were kindly furnished by the

Table 2. Outcome of pregnancies from histories given on personal interviews for women in various areas of the United States.

Classification of Population	Year of Study	Number of Pregnancies	Per Cent of Total by Type of Termination			
			Total	Live Births	Still-births	Abortions
Morbidity Reports on Periodic Canvasses						
18 States (White)—12 months[1]	1928–1931	910	100.0	83.6	1.7	14.7
Cities 100,000 and Over		336	100.0	84.5	1.5	14.0
Cities 5,000 to 100,000		236	100.0	82.2	1.3	16.5
Rural, under 5,000		338	100.0	83.7	2.1	14.2
Cattaraugus Co. (White)—30 Months[a]	1930–1932	278	100.0	88.1	4.7	7.2
Pregnancies Previous to One Reported on Survey or Registered						
New York City[2]	1935–1936	1,525	100.0	85.4	2.6	12.1
Cattaraugus County, N. Y. (White)[a]	1936	605	100.0	86.7	2.6	10.7
Previous Pregnancies and Current Hospital Births						
New York City (White Multiparae)[3]	1931–1932	7,686	100.0	85.0	15.0*	
Chicago (White Multiparae)[3]	1931–1932	5,840	100.0	86.7	13.3*	
Pregnancy Histories for Clients of Birth Control Clinics						
New York City (White)[4]	1932–1933	3,106	100.0	69.4	1.3	29.3
Cincinnati (White)[a]	1936–1937	7,289	100.0	81.0	2.2	16.8
Baltimore (18 Per Cent Negro)[5,6]	1927–1932	6,441	100.0	84.4		15.6

[a] Unpublished data from studies of the Milbank Memorial Fund.

[1] For a complete description of this survey, *see* Collins, Selwyn D.: Causes of Illness in 9,000 Families Based on Nation-Wide Periodic Canvasses, 1928-1931. *Public Health Reports*, United States Public Health Service, March 24, 1933, xlviii, No. 12, pp. 283-308. Detailed data by size of community and type of termination presented here were supplied by Mr. Collins from unpublished tabulations.

[2] *Op. Cit.*, note 2.

[3] Pearl, Raymond: Fertility and Contraception in New York and Chicago. *The Journal of the American Medical Association*, April 24, 1937, cviii, No. 17, p. 1385.

[4] Stix, Regine K.: A Study of Pregnancy Wastage. The Milbank Memorial Fund *Quarterly*, October, 1935, xiii, No. 4, pp. 347-365.

[5] Pearl, Raymond: Statistical Report on the Fifth Year's Operations of the Bureau for Contraceptive Advice. Fifth Report of the Bureau for Contraceptive Advice. Baltimore, 1933, pp. 5-17.

[6] Moses, Bessie L.: CONTRACEPTION AS A THERAPEUTIC MEASURE. Baltimore, The Williams and Wilkins Company, 1936.

* The proportion of abortions among the current hospital births is almost certainly much lower than among pregnancies in the general population, since the hospitalized abortions will be chiefly those accompanied by a definite morbidity and therapeutic abortions. It may be estimated that the wastage among *previous* pregnancies of these women would be about 18 per cent for the New York women and 16 per cent for the Chicago group.

United States Public Health Service. Most of the surveys were made in recent years, but, except for the morbidity surveys, the pregnancies reported may have occurred over a considerable period prior to the date of the study.

It is of particular interest that the maximum incidence of abortion of all types reported in any of these studies, except that based on the preclinic experience of clients of a birth control clinic in New York City, is 17 per cent of total pregnancies. This maximum rate is reported both for women who eventually attended the Cincinnati birth control clinic and for women in the morbidity survey in cities of 5,000 to 10,000 population. The abortions reported by the women in larger cities and in rural communities in the morbidity survey were a somewhat smaller proportion of total pregnancies, but the differences are not statistically significant. The average per cent, 15 per 100 pregnancies, for all types of communities may be used, therefore, as the indicated rate for this typical cross-section of the general population.[4]

As already mentioned, several factors operate to make the abortion rate among *previous* pregnancies of women with a current hospital or registered birth a minimum, and the rates in Table 2 from histories of this type do tend to be somewhat lower than those obtained from morbidity surveys, with the exception of the studies in rural Cattaraugus County. The low rates for abortions in the Cattaraugus studies, 7.2 per cent in the morbidity survey, and 10.7 per cent among previous pregnancies, are not confirmed by the rate for rural and small-town women surveyed in eighteen states. The conclusion may be ventured, tentatively, that abortions in rural areas are somewhat less frequent than in urban centers but that the difference is not large.

The frequency of abortion reported for cities in these various

[4] The pregnancy record obtained from the morbidity survey would apply chiefly to married women, although a few illegitimate births are included. Among the 134 abortions reported, two were for single women or 1.5 per cent of the total; illegitimate births among white women were 1.8 per cent of registered births in 1930. All women in the clinic studies are married.

studies shows a range from 12.1 per cent to 16.8 per cent, if the birth control group in New York City is excluded. The lower rate is probably too low but the higher rate is for clinic patients and may be considered a maximum figure for an average urban estimate. As the total number of pregnancies is not usually known, the number of abortions is expressed more frequently as a ratio to the number of registered births. Abortion rates of 12.1 and 16.8 per cent of total pregnancies give ratios of 14 and 20 abortions per 100 births.

The higher ratio of 1 to 5 births is in agreement with that used by Taussig[5] for rural women but is only half as high as Taussig's estimate for urban women. The ratio of 1 to 2.5 births used by Taussig for cities was based chiefly on histories obtained from clients of the New York City clinic for which data are given in Table 2. The high percentage of pregnancies terminated by abortion which is shown for the preclinic experience of this group does not seem to be representative since it is more than twice as high as the percentages obtained in the two studies made in New York City for unselected groups of married women. These two studies showed approximately the same result and do not give any evidence of a marked excess of abortions in New York City over other urban areas. It is believed that data at present available do not support an estimate for abortions in cities to exceed the ratio of one abortion to five births.

On the basis of 15 to 17 per cent of total pregnancies terminating in the first six months of pregnancy and about 30 per cent of maternal deaths occurring in the same period of uterogestation, it may be estimated that mortality of women experiencing abortions is about twice as high as the mortality of women delivered after pregnancy has advanced beyond the sixth month.

Spontaneous Abortion. In some of the studies from which data in Table 2 were taken, abortions are classified as to whether spon-

5 Taussig, Frederick J.: ABORTION, SPONTANEOUS AND INDUCED. St. Louis, The C. V. Mosby Company, 1936, p. 26.

Population in Study	Spontaneous Abortions		Total Pregnancies Excluding Illegal Abortions
	Per Cent	Number	
Baltimore Birth Control Group	10.7[1]	649	6,082
Cincinnati Birth Control Group	9.1	612	6,706
New York City Birth Control Group	7.7	186	2,420
New York City—General	9.2	137	1,481

[1] Includes therapeutic abortions; addition of therapeutic abortions for the Cincinnati and New York City birth control groups makes these percentages 9.6 and 9.2, respectively. Eighteen per cent of the Baltimore group were Negroes, and spontaneous abortions probably are somewhat more frequent among Negroes. For the general population study in New York, inclusion of therapeutic abortions gives a percentage of 9.5.

Table 3. Frequency of spontaneous abortion.

taneous or induced. The reported frequency of spontaneous abortion is shown in Table 3. This information is given for the three clinic groups, for which it is thought to be especially reliable, and for one general population group in New York City.

From 8 to 10 per cent of all pregnancies, exclusive of those terminated by an illegal abortion, resulted in spontaneous abortions. These occurred apparently at a fairly constant rate for these groups which are known to differ greatly in their socio-economic composition.[6] It is believed that an average rate for spontaneous abortions of about 9 per cent, among white women, or a maximum of 10 per cent, is a fairly dependable base line from which the per cent of illegal abortions may be estimated, when data on total non-viable terminations are available. A record of such terminations is obtained much more easily than information concerning the type of abortion.

Illegal Abortions. Concern over the problem of abortions centers chiefly on the number of illegally induced abortions, because there is an especial hazard to the mother's life in this type of abortion. Their reported incidence for the birth control clinic groups and several general population groups is presented in Table 4. For the groups not selected on the basis of interest in contraception, less than 4 per cent of pregnancies were stated to have been interrupted

[6] Analysis of the outcome of pregnancies of women in the general group and the birth control clinic group in New York City showed no significant variation in the frequency of spontaneous abortion according to economic group or according to order of pregnancy.

Group Studied	Illegal Abortions		Total Number of Pregnancies
	Per Cent	Number	
Baltimore Birth Control Clinic Group	5.6	359	6,441
Cincinnati Birth Control Clinic Group	8.0	583	7,289
New York City Birth Control Clinic Group	22.1	686	3,106
New York City—General	2.9	44	1,525
New York City—Multiparae in Hospital[1]	3.2	244	7,686
Chicago—Multiparae in Hospital[1]	2.1	120	5,840

[1] Available figures are for current hospital births and previous pregnancies combined. It is estimated that an adjustment for the relatively low percentage of illegal abortions among current births in the hospitals would raise the percentages for these groups about one-third.

Table 4. Incidence of illegal abortions.

by an induced abortion. The studies by Pearl of total reproductive histories for women delivered in various hospitals in New York City and in Chicago, and similar histories for women in New York City interviewed at home after reporting a recent pregnancy during a morbidity survey, are in close agreement, as the frequency of induced abortions varies from a little less than 3 per cent to about 4 per cent. The percentages for clinic groups in Baltimore and Cincinnati are 5.6 and 8.0, respectively.

On the basis of 14.7 per cent for total abortions, shown in Table 2 for pregnancies reported in the morbidity survey in eighteen states, we may estimate that about 5 per cent were illegal abortions. Although slightly higher than the proportion from histories of *previous* pregnancies, and lower than that for clinic groups, it corresponds well with an estimated per cent between the low and high rates obtained from these two types of studies.

SUMMARY

From three types of investigations, data showing the outcome of pregnancies were assembled. The studies included: (1) preclinic pregnancy histories for clients of birth control clinics in three cities; (2) histories of previous pregnancies for women who had had a recent birth; and (3) pregnancies reported during a morbidity survey in which the same families were visited at short intervals over a period of one or more years.

Total abortion rates for urban samples studied varied from 12.1 per cent to 16.8 per cent; and the weight of evidence favors a rate of approximately 15 per cent of total pregnancies, or 18 abortions per 100 live and stillbirths.

Spontaneous abortions were found to occur in 9 to 10 per cent of pregnancies.

Illegal abortions reported varied from slightly less than 3 per cent to 8 per cent, 4 or 5 per cent of total pregnancies being the most probable rate for married white women in the general population.

Limited data for rural communities suggest that abortions may be somewhat less frequent in the rural areas.