

PREGNANCY WASTAGE IN NEW YORK CITY¹

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INVESTIGATIONS of maternal deaths, of which there have been many in recent years, have shown that from one-fourth to one-third of these deaths occurred in the first six months of pregnancy, or before the fetus had become viable. There are almost no data, however, to indicate the frequency of previable terminations among all pregnancies, since registration of the previable product of pregnancy is usually not required, and if required, as in New York City, registration is known to be incomplete. Interest in the previable terminations arises not only from the fact that a record of their frequency would enable us to compute a more accurate maternal death rate but also from the fact that so little is known of the factors associated with this type of pregnancy wastage. Furthermore, the high proportion of septic deaths among the maternal deaths occurring in the previable period has led to much speculation as to the frequency of induced abortion.

There are obvious difficulties involved in obtaining complete reports on early pregnancy terminations, especially self-induced and illegal abortions. A relationship of confidence must be established by the questioner. The most complete records available are those published for clients of birth control clinics,² but these women are not representative of the general population since they are selected on the basis of their interest in family limitation.

The present paper reports on the outcome of pregnancies as shown by two types of special surveys made in New York City. The first survey was a house-to-house canvass to obtain records of morbidity, in which the informant was asked specifically if there were

¹ From the Milbank Memorial Fund.

² Kopp, Marie E.: *BIRTH CONTROL IN PRACTICE*. New York, McBride and Company, 1934; 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; Stix, Regine K.: *A Study of Pregnancy Wastage*. The Milbank Memorial Fund *Quarterly*, October, 1935, xiii, No. 4, pp. 347-365.

any live or stillbirths or miscarriages during the past twelve months. For all births occurring within four months of the enumerator's visit, a follow-up visit was made by a specially trained investigator who obtained a detailed record of the current pregnancy and a careful history of all previous pregnancies for women reporting a current pregnancy. In the original survey, no effort was made to classify a reported miscarriage, but on the revisit information was sought for both the current and previous pregnancies concerning the cause of abortion and whether it was spontaneous or induced.

Description of Sample. The original survey was conducted in the winter of 1935-1936 by the United States Public Health Service in cooperation with the Works Progress Administration, and was a part of the Health Inventory or Chronic Disease Survey.³ In the supplementary study of maternity cases, which forms the basis of this report, the Milbank Memorial Fund cooperated with the United States Public Health Service. For the original survey, the file of occupied houses and apartments in all five boroughs of New York City assembled by the Real Property Inventory was sampled by drawing every thirty-sixth domicile listed; and every family residence drawn was visited. If any residence was unoccupied at the time of the visit, another in the same neighborhood was substituted. The sample of over 48,000 families visited is believed to give a representative sample of families in New York City.

In these families, 1,030 pregnancies were reported as terminating within four months of the enumerator's visit. During 1936, 860⁴ of these families were revisited by a trained nurse who had had a great deal of experience on obstetrical service and also had had experience as a field investigator. A special record of all symptoms and care during the current pregnancy was obtained from the mother who

³ Perrott, George St. J. and Holland, Dorothy F.: Chronic Disease and Gross Impairments in a Northern Industrial Community. *The Journal of the American Medical Association*, 108, No. 22, May 29, 1927, pp. 1876-1886.

⁴ All addresses were revisited, but 170 families had moved or refused to give further information or were not at home on repeated visits.

was also questioned in detail about her previous pregnancies. There were no maternal deaths in this series of cases; and the special data are, therefore, for living women all of whom reported a pregnancy to the enumerators of the original survey. This may bias the sample slightly, since the chances of an abortion resulting in a fatality are presumably relatively high and, as will be shown later, previable terminations were incompletely reported. The omission of some women with abortions of current occurrence may affect the past history as well as the current record since those who resort to induced abortion may have a higher rate than an average group; that is, they may tend to have repeated abortions. The record for this sample is, therefore, a minimum figure, even if we assume that all the women in the study gave a complete history.

In Table 1, the original sample is compared with the registered live births in New York City in 1935 according to borough and

Table 1. Comparison of the distribution of pregnancies in the survey sample, according to borough, color, and order of births with that for all live births registered in New York City.

CLASSIFICATION	ORIGINAL SURVEY	REVISITED CASES	NEW YORK CITY LIVE BIRTHS ¹
BOROUGH OF RESIDENCE—TOTAL	100.0	100.0	100.1
Bronx	23.4	22.8	19.0
Brooklyn	38.3	37.2	38.9
Manhattan	21.5	23.9	23.7
Queens	15.6	14.7	16.0
Richmond (Staten Island)	1.2	1.4	2.5
COLOR—TOTAL	100.0	100.0	100.0
White Mothers	94.0	93.7	92.9
Negro and Other Colored	6.0	6.3	7.1
ORDER OF BIRTH—TOTAL	a	100.0	100.0
First		30.8	40.7
Second or Third		44.1	41.9
Fourth or Fifth		15.7	11.1
Sixth or More		9.4	6.3

¹ Figures for New York City by borough and color are for 1935; data by order of birth are for 1934.

^a Not available for women not interviewed on the follow-up survey.

SAMPLE	PREGNANCY WASTAGE PER 100 LIVE BIRTHS			NUMBER OF LIVE BIRTHS	NUMBER OF STILL- BIRTHS	NUMBER OF ABOR- TIONS
	Still- births Last Trimester	Abortions and Mis- carriages	Total Wastage			
Registered Births, New York City	2.8	2.0	4.8	100,657	2,820	2,059
Original Survey	1.4	5.8	7.2	961	13	56
Revisited Sample:						
Current Pregnancy ¹	1.4	4.8	6.2	810	11	39
Previous Pregnancies ¹	3.0	14.1	17.1	1,302	39	184

¹ Adjusting the rates for the survey sample to the distribution of live births in New York City by order of birth changed no rate as much as 0.1.

Table 2. Outcome of pregnancies reported during a morbidity survey and of the previous pregnancies of the same women who were revisited, compared with the outcome of registered births in New York City, 1935.

color; and the revisited sample is compared with the live-birth registrations in 1934 by order of birth. From these data, it will be noted that the survey sample does not differ significantly from New York City except with respect to the distribution of pregnancies by order of birth. The survey is low in the proportion of first births and relatively high in the proportion at each succeeding order of birth; but some of the difference may be accounted for by the more complete record of previous births for women in the survey.

Frequency of Pregnancy Wastage. In the original survey among the 1,030 pregnancies reported, there were sixty-nine stillbirths and previable terminations⁵ or 7.2 wastage terminations for every 100 live births. This ratio is 50 per cent higher than that for registered births in New York City in 1935, as is shown in Table 2. The number of stillbirths reported in the original survey was relatively low but abortions and miscarriages reported had a ratio to live births

⁵ In classifying the data for analysis, any pregnancy loss of twenty-six weeks' gestation or over has been counted as a stillbirth; any loss under twenty-six weeks' gestation, born dead, as a previable termination. One case, born alive, was reported twenty-four weeks' gestation; it died after a few minutes, but is not included in the pregnancy loss. In this report, previable terminations include all abortions, whether spontaneous or induced, miscarriages and ectopic pregnancies; and the term abortion is used as synonymous with previable termination. 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.

that is nearly three times the ratio for registered births in New York City.

Of special interest, however, is the high rate for previable terminations among the previous pregnancies reported by the women who were revisited. For each 100 live births to these women, there had been three stillbirths and fourteen pregnancies terminated before the twenty-sixth week. It is apparent that the data obtained in the general survey are incomplete and do not represent the true incidence of abortion. This result is not at all surprising because there is a natural reluctance to discuss abortions, and the enumerators in the original survey, most of whom were men, gave no special emphasis to obtaining a complete pregnancy record since this formed a very small part of the data asked for. It is an important finding because it brings out sharply one of the difficulties encountered in studying abortions in a general population; and, furthermore, it indicates that only the histories of previous pregnancies are complete enough to warrant any analysis of factors associated with pregnancy wastage for this sample of women.

Termination by Color. There was little difference according to color in the percentages of pregnancies reported as terminating in the previable period or as stillbirths; but the number of Negro and other colored women in the survey is too small to give dependable results on this point. For both white and Negro women, the pregnancy wastage reported in the general survey was much lower than that shown by the histories of previous pregnancies, as may be seen in Table 3, and the wastage according to reproductive histories was about 15 per cent of all pregnancies.

Comparison with Other Data. The pregnancy loss reported by women in this study is lower than most estimates of wastage which have been published and it is, therefore, of interest to examine the very limited data available. In a recently published article, Pearl⁶

⁶ 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. Percentages

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COLOR OF MOTHER	PERCENTAGE OF TOTAL PREGNANCY TERMINATIONS					NUMBER OF PREGNANCIES	NUMBER OF WOMEN
	Total	Live Births	Pregnancy Wastage				
			Total	Stillbirths	Abortions		
CURRENT PREGNANCIES OF WOMEN REVISITED							
TOTAL	100.0	94.2	5.8	1.3	4.6	860	860
White	100.0	94.0	6.0	1.4	4.6	806	806
Negro and Other Colored	100.0	96.3	3.7	0	3.7	54	54
HISTORIES OF PREVIOUS PREGNANCIES							
TOTAL	100.0	85.4	14.6	2.6	12.1	1,525	595
White	100.0	85.4	14.6	2.4	12.2	1,358	549
Negro and Other Colored	100.0	85.6	14.4	3.6	10.8	167	46

Table 3. Outcome of pregnancies according to color for women reporting a pregnancy during a morbidity survey in New York City in the winter of 1935-1936.

has reported on the reproductive histories of white and Negro women in New York City who were interviewed by a physician while hospitalized for a confinement in 1931 or 1932. This affords an ideal opportunity to obtain the fullest cooperation of the patient and the histories should be unusually complete, but the proportion of current pregnancies terminated by abortion, especially illegal abortion, may be assumed to be relatively low. Pearl has classified the women in his study as primiparae and multiparae, and the pregnancy wastage reported for the multiparae is that for all pregnancies, including the current one. The total pregnancy loss, including stillbirths, experienced by white multiparae was 15 per cent, and for Negro multiparae was 14 per cent. Percentages for the multiparae in our study computed on the same basis, that is, histories and current pregnancies combined, were 12.3 and 11.7 per cent. Although the pregnancy loss reported for our sample is significantly lower than was reported in the hospital study, the general similarity of the results gives considerable assurance that they approximate conditions in this City. Even if some allowance is made for the low rate

used for comparison with our study were derived from the data given in several tables in the original article. Total pregnancies for white multiparae in the New York City sample numbered 7,686, and for Negro multiparae, 1,330.

of abortions among current pregnancies, these studies indicate a much lower pregnancy wastage than is generally assumed for New York City.

Although comparison with published data must be made with extreme caution, especially because of differences in definitions of abortions, the results for several selected groups of women may be cited. For women who had abortions (defined as terminations before the fifth month of gestation) in the Cincinnati General Hospital in the period from 1918 to 1932, Millar⁷ reported the number of previous abortions and the number of full-term pregnancies. For these pregnancies to women selected on the basis of a present abortion case, the rate was 12.9 abortions per 100 pregnancies. Although stillbirths and live births delivered in the fifth to eighth months of gestation are not included, it is believed that this does not seriously affect the proportion, since the omitted pregnancies would be divided between abortions and viable terminations by the definition followed in this study. Grier⁸ quotes an abortion rate of 11 per cent for pregnant women in the private practices of Dr. Danforth and Dr. Galloway in Evanston, Illinois. This rate, as indicated by Grier, presumably would not include illegal abortions, although resort to induced abortion is not necessarily ruled out because the women had consulted a physician concerning their pregnancies. For 1,131 women who attended The Bureau of Contraceptive Advice in Baltimore, Pearl⁹ has reported the outcome of their 6,441 pregnancies. The "products of conception lost before term (abortion or miscarriage)" were 15.6 per cent of the total pregnancies.

The extent of natural or unavoidable pregnancy loss due to still-

⁷ Millar, William M., M. D.: Human Abortion. *Human Biology*, May, 1934, 6, No. 2, pp. 271-307. The figures quoted are derived from Table 12 by deducting the present abortion cases from the total number of abortions and relating the remainder or previous abortions of these women to the 8,402 full-term deliveries reported.

⁸ Grier, Robert M., M.D.: Fetal Mortality. *American Journal of Obstetrics and Gynecology*, December, 1931, xxii, No. 6, p. 890.

⁹ *Op. cit.*, note 2.

births, spontaneous and therapeutic abortions has not been well established, although it is a matter of great importance. In the data quoted above, the frequency of induced abortions is not given, except in the New York City study reported on by Pearl. For his sample of white multiparae, 3.2 per cent of the pregnancies had been wilfully interrupted and 11.8 per cent had terminated in natural or unavoidable wastage. Data from the same article by Pearl indicate that 2.1 per cent of 5,840 pregnancies reported by white multiparous women in Chicago had been terminated by an illegal abortion and 11.3 per cent resulted in stillbirths, and spontaneous or therapeutic abortions. It is interesting to compare these figures with the unavoidable wastage reported by Stix¹⁰ for 991 clients of the Birth Control Clinical Research Bureau in New York City. The reproductive histories of these women before attending the Clinic were obtained by Dr. Stix by personal interviews. The total pregnancy loss reported was very high, being 30.6 per cent of all pregnancies; and 22.1 per cent of the pregnancies had been terminated by illegal abortions. If these illegal abortions are deducted from the total pregnancies, and the wastage from other causes is related to the total pregnancies minus illegal terminations, the percentage loss for the uninterrupted pregnancies becomes 10.9. For women in our survey, 11.6 per cent of the *previous* pregnancies had resulted in stillbirths or spontaneous abortions, and 3.1 per cent were terminated by induced abortion, including the therapeutic abortions. The rates for total pregnancy loss from natural causes reported in these various studies show a surprising degree of similarity, and the wastage from stillbirths and spontaneous abortion is too consistently about 11 or 12 per cent in these studies of very different population groups to be dismissed as a mere chance phenomenon.

Data from registration of births have shown that the ratio of stillbirths to live births varies little from one community to another

¹⁰ Cf. *Op. cit.*, note 2.

ORDER OF PREGNANCY	TOTAL NUMBER OF PREGNANCIES BEFORE THE SURVEY BIRTH	PER CENT OF TOTAL PREGNANCY TERMINATIONS					
		Total	Live Births	Stillbirths	Pregnancy Wastage		
					Total	Spontaneous	Induced
TOTAL	1,525	100.1	85.4	2.6	12.1	9.0	3.1
First	595	100.0	87.1	2.7	10.2	8.2	2.0
Second	354	100.0	83.9	2.3	13.8	10.2	3.7
Third	216	100.0	83.3	2.3	14.4	9.3	5.1
Fourth	128	100.0	84.4	3.9	11.7	9.4	2.3
Fifth or More	232	100.1	85.8	2.2	12.1	8.6	3.5

Table 4. Type of termination according to the order of birth for all previous pregnancies of a group of women reporting a current birth in a New York City survey in 1935-1936.

and has shown almost no decline during the past twenty years. From a special investigation by the Children's Bureau¹¹ of births in Baltimore in 1915, data on the outcome of 14,542 *previous* pregnancies of native white women are available. It was reported that 8.5 per cent of these had been terminated by abortion (before the seventh month of gestation) and 2.4 per cent by stillbirths, or a total pregnancy wastage of 10.9 per cent. These pregnancies occurred about twenty-five or more years ago, and probably included few induced abortions. The conclusion seems justified that the proportion of pregnancies terminated by spontaneous abortions as well as by stillbirths has been fairly constant for many years.

Pregnancy Termination by Order of Birth. The 1,525 previous pregnancies of the 595 women whose current pregnancy was the second or higher order of pregnancy are classified in Table 4 according to their order, and the outcome for each order is shown. The pregnancy wastage from abortions for the first birth to these 595 women, regardless of the number of later births, was 10.2 per

¹¹ Rochester, Anna: *Infant Mortality. Children's Bureau Publication No. 119.* Government Printing Office, 1923. Figures quoted are derived from Appendix Tables 187 and 188. The rates for abortions were somewhat higher in this study for the native-white women than for the foreign born, a difference which may be associated with the accuracy of reporting since many of the foreign born were either illiterate, or were unable to speak English, or both. The stillbirth rates were similar.

PARITY IN SURVEY OF WOMEN INCLUDED AT EACH ORDER	PREGNANCY ORDER FOR PREVIOUS BIRTHS	NUMBER OF PREGNANCIES	PER CENT OF TOTAL PREGNANCY TERMINATIONS					
			Total	Live Births	Type of Pregnancy Wastage			
					Stillbirths	Abortions		
						Total	Spon-taneous	Induced
2nd or 3rd	First	379	100.0	86.0	2.4	11.6	9.2	2.4
3rd or 4th	Second	227	100.1	81.1	3.1	15.9	11.9	4.0
4th or 5th	Third	135	100.0	80.0	0.7	19.3	11.1	8.2
5th or 6th	Fourth	74	100.1	75.7	6.8	17.6	13.5	4.1
6th or Higher	Fifth or Higher	135	100.1	83.0	3.0	14.1	10.4	3.7
Total for Two Previous Pregnancies		950	99.9	82.7	2.7	14.5	10.6	3.9

Table 5. Type of termination according to the order of birth for the last and next to last pregnancies preceding the current birth reported in the original survey in New York City in 1935-1936.

cent and somewhat lower than for subsequent pregnancies. For second and higher orders of pregnancy no real difference in the percentage of pregnancies terminated by stillbirths or abortions is shown. This result was somewhat surprising because the reproductive histories reported on by Stix¹² showed a marked increase in abortions with advancing years of married life and records for birth control clinic patients in New York City reported on by Kopp¹³ and in Baltimore¹⁴ also indicated a rise in wastage as order of birth advances. Clients of birth control clinics are a highly selected group because of their definite interest in family limitation, and there is evidence to indicate that when a pregnancy results as a failure in contraception, a high percentage of women resort to illegal abortion.¹⁵ In fact, the data given by Stix show that, if illegal abortions are excluded, there was no significant rise in pregnancy wastage with advancing years of married life. Our sample would indicate that in an average group, women experiencing a high order

¹² Cf. *op. cit.*

¹³ Kopp, *op. cit.*

¹⁴ Pearl, note 2.

¹⁵ Cf. Stix, *op. cit.*, and Pearl, note 6.

of pregnancy were no more likely to have a previable termination than were women experiencing their second or third pregnancy.

The previous pregnancies of any specific order for the group as a whole, obviously, occurred over a considerable period of years.

Furthermore, the early pregnancies to women with large families and still bearing children not only represent births many years previous but also are births to women selected into the study because of their large families. Terminations of pregnancies occurring in a more restricted time period are shown in Table 5, in which only the last and next to last pregnancy before the current survey pregnancy are counted. In

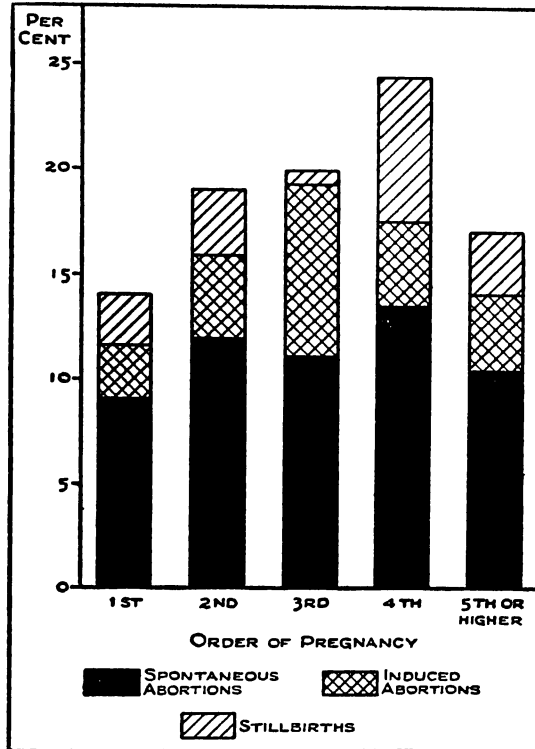


Fig. 1. Order of pregnancy and pregnancy wastage for the two most recent pregnancies prior to the birth reported in the morbidity survey in New York City, 1935-1936.

this table and in Figure 1, the outcome of first pregnancies of women whose total births, including that in the current survey, numbered only two or three is compared with the outcome of second pregnancies of women whose total births numbered three or four. When the time range is limited¹⁶ by considering only the

¹⁶It is, of course, possible that a long interval of time may have elapsed between the present pregnancy and the preceding one, but this is rare and the time period during which the two preceding pregnancies would occur seldom would exceed five or six years. It will be noted that the abortion rate for these recent pregnancies is higher than that for all previous pregnancies; this may reflect the influence of an upward trend in abortions, but

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preceding birth and the one before that for each woman, there is greater variation in the frequency of abortions according to order of birth.

For these recent pregnancies, the frequency of abortion rose from 11.6 per cent of first pregnancies to 19.3 per cent of third pregnancies, giving a difference of 7.7 per cent which is definitely significant since the chances that it would occur on the basis of random sampling are less than three in a hundred. The frequency of abortions declined slightly for the fourth pregnancies, and among pregnancies of the fifth or higher order, the percentage dropped to 14.0.

Induced abortions showed a greater variation with order of birth than the spontaneous abortions and accounted for most of the differences observed in the abortion rates by order of birth. The average induced abortion rate for the two recent previous pregnancies was 3.9 per cent; among first pregnancies 2.4 per cent were interrupted by some type of induction but among third pregnancies 8.2 per cent were interrupted. After the third pregnancy, the induced abortion rate declined to about 4 per cent.

Income and Pregnancy Wastage. The relation of income and economic strain in the family to the frequency of abortion and other pregnancy wastage is of considerable interest. At the time of the original survey, each family was classified according to its total income for the past year, but no information was obtained concerning changes in income. The income data refer, therefore, to the year 1935 and many families no doubt had had higher incomes for some years during which the previous pregnancies occurred. On the other hand, it is probable that very few families with relatively high incomes in 1935 had received lower incomes in preceding years. Table 6 shows the distribution of pregnancies according to types of termination for women of different income groups.¹⁷

since the previous pregnancies at an earlier period are for a selected group of women and since abortions occurring in this earlier period are more apt to be forgotten, we cannot be certain that an increase has occurred.

¹⁷ All families with \$2,000 or more have been grouped together in this report, although (Continued on page 241)

INCOME CLASSIFICATION IN 1935	TOTAL PREGNANCIES	PERCENTAGE OF TOTAL PREGNANCY TERMINATIONS					
		Total	Live Births	Pregnancy Wastage			
				Still-births	Abortions		
		Total	Spon-taneous	Induced			
TOTAL PREVIOUS PREGNANCIES							
ALL INCOMES ¹	1,525	100.1	85.4	2.6	12.1	9.0	3.1
Relief	555	100.0	87.4	2.7	9.9	7.0	2.9
Under \$1,000	184	100.0	83.2	2.2	14.6	9.2	5.4
\$1,000-1,499.99	359	100.0	86.9	2.2	10.9	7.8	3.1
\$1,500-1,999.99	221	100.0	82.8	3.2	14.0	11.3	2.7
\$2,000 or More	184	100.0	84.2	2.2	13.6	11.4	2.2
LAST AND NEXT TO LAST PREGNANCIES PRIOR TO PRESENT PREGNANCY							
ALL INCOMES ²	950	99.9	82.7	2.7	14.5	10.6	3.9
Relief	270	100.1	85.6	2.6	11.9	8.1	3.7
Under \$1,000	136	100.0	78.7	2.2	19.1	11.0	8.1
\$1,000-1,499.99	238	100.1	82.8	3.4	13.9	10.1	3.8
\$1,500-1,999.99	161	100.0	82.0	3.7	14.3	11.8	2.5
\$2,000 or More	129	100.0	83.7	1.6	14.7	12.4	2.3

¹ Includes twenty-two pregnancies for women whose income was not reported.

² Includes sixteen pregnancies for women whose income was not reported.

Table 6. Family income and pregnancy wastage according to pregnancy histories obtained from women reporting a present pregnancy in a survey of families in New York City in 1935-1936.

The proportions of all previous pregnancies which terminated in stillbirths or in abortions did not vary significantly or consistently according to family income. The same indication is obtained when the comparison of income groups is based on the two most recent previous pregnancies, as may be seen in Fig. 2, except for a striking difference between relief families and the nonrelief families of lowest income. This is in agreement with the findings reported by Pearl¹⁸ who found no correlation between income and abortions for women attending the Baltimore Bureau of Contraceptive Advice, and with the results for native-white mothers in the Children's Bureau study in Baltimore in 1915.

The relatively low proportion of abortions (11.9 per cent) among

the original records classified them in more detail. The number of births recorded for the higher income groups was too small to permit more detailed tabulation.

¹⁸ Pearl, Raymond: Some Data on Fertility and Economic Status. *Human Biology*, 4, No. 4, December 1932, pp. 525-553.

the recent pregnancies of women in families on relief, and the high proportion (19.1 per cent) for women in families with an annual income of less than \$1,000 present an interesting contrast within a

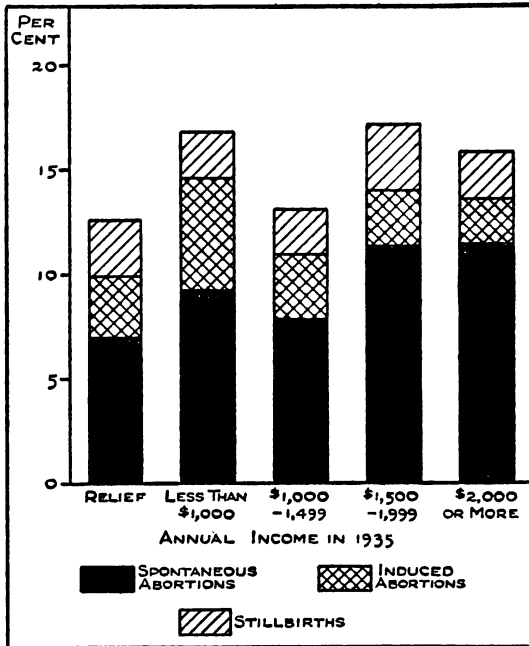


Fig. 2. Family income and pregnancy wastage for the two most recent pregnancies prior to the birth reported in the morbidity survey in New York City, 1935-1936.

are considered, we find that only the difference between the rates for induced abortions is significant. In families with less than \$1,000 annual income, more children would be a serious strain on the family budget and the relatively high rate of induced abortions apparently reflects a desire on the part of these families to avoid this added economic burden. Those who fail to limit the size of their families by some means are selected into the relief group.

Although the pregnancy loss from all types of abortion varied only slightly for families not on relief, an interesting difference is

¹⁹ The chances are about 5 in 100 that the observed difference in the rate for abortions for the relief group and the rate for the group with annual incomes of less than \$1,000 would arise from independent samplings of the same universe.

group that would be classed as the poorest families in the study.¹⁹ It has been shown that the loss from abortion was relatively low among the pregnancies of high order, and we should expect births of high order to occur most frequently in low-income families which, in turn, are forced by inability to provide for a large family to seek some type of public assistance. If the spontaneous and induced abortion rates for these two income groups

indicated for the reported frequency of spontaneous and induced abortions. Thus, spontaneous abortions tend to increase with income and induced abortions to decrease. However, when only the two most recent previous pregnancies for each woman are counted, the increase in spontaneous abortions is diminished, and the decline in induced abortions as income increases becomes more marked. There probably was some tendency for women in the higher income groups to be less frank in reporting that an abortion had been induced, but it also seems likely that fewer unwanted pregnancies occurred and that, therefore, fewer were interrupted by an induced abortion.

The number of abortions per 100 women of different incomes shows a different picture from that for the incidence among pregnancies experienced. For families on relief, there were thirty-six abortions reported per 100 women, higher than for any other income group, as is shown in Table 7. Because of the larger number of pregnancies for the women in relief families, they were more frequently exposed to the chance of abortion and, in spite of the lower incidence per 100 pregnancies, they experienced the largest

Table 7. Pregnancy wastage per 100 women in different income groups in New York City according to history of pregnancies prior to the pregnancy at time of interview in 1936.

INCOME CLASSIFICATION IN 1935	NUMBER OF WOMEN	NUMBER OF PREVIOUS PREGNANCIES	PREGNANCY TERMINATIONS ACCORDING TO TYPE PER 100 WOMEN					
			All Pregnancies	Live Births	Pregnancy Wastage			
					Stillbirths	Abortions		
						Total	Spontaneous	Induced
ALL INCOMES ¹	595	1,525	256.3	218.8	6.6	30.9	23.0	7.9
Relief	152	555	365.1	319.1	9.9	36.2	25.7	10.5
Under \$1,000	83	184	221.7	184.3	4.8	32.5	20.5	12.0
\$1,000-1,499.99	158	359	227.2	197.5	5.1	24.7	17.7	7.0
\$1,500-1,999.99	106	221	208.5	172.6	6.6	29.2	23.6	5.7
\$2,000 or More	84	184	219.0	184.5	4.8	29.8	25.0	4.8

¹ Includes twelve women with twenty-two pregnancies whose income was not reported.

number of abortions. Among women in the upper income groups, there were thirty abortions of all types per 100 women. The average rate for women in all income groups was thirty-one per 100 women; and 23 per cent of the 595 women for whom a previous history was obtained had had one or more abortions.

Terminations by Income and Order of Birth. The two most recent pregnancies, exclusive of the current or survey pregnancy, to each multiparous woman which were shown by order of birth in Table 5 are classified according to family income in Table 8. The number of cases in many of these subclasses becomes too small to be of definite significance, but some interesting indications are afforded. For women on relief and also for those with incomes of \$1,500 or more, there was no significant difference in the incidence of abortions according to order of pregnancy, and for each specific order of birth there was no significant difference in the abortion rate for these two income groups. This is clearly shown in Figure 3. In the low-income families not receiving aid, the incidence of abortion rose from 9 per cent among first pregnancies to 31 per cent for third and fourth pregnancies, but women having a fifth or higher order of pregnancy aborted only at the rate of 13 per cent.

Table 8. Pregnancy wastage by order of birth and family income for the two preceding pregnancies of women interviewed following a present pregnancy in New York City in 1936.

ORDER OF BIRTH	TOTAL NUMBER OF PREGNANCIES				PER CENT OF TOTAL PREGNANCIES TERMINATED AS STILLBIRTHS				PER CENT OF TOTAL PREGNANCIES TERMINATED BY ABORTION			
	All Incomes	Income Groups			All Incomes	Income Groups			All Incomes	Income Groups		
		Relief	Under \$1,500	\$1,500 or Over		Relief	Under \$1,500	\$1,500 Or over		Relief	Under \$1,500	\$1,500 or Over
TOTAL	950 ¹	270	374	290	2.7	2.6	2.9	2.8	14.5	11.9	15.8	14.5
TOTAL ADJUSTED ²					2.8	2.5	3.0	2.6	14.5	12.0	16.6	14.4
First	379	60	172	138	2.4	1.7	1.7	3.6	11.6	11.7	8.7	15.2
Second	227	54	93	77	3.1	3.7	3.2	2.6	15.9	13.0	18.3	14.3
Third and Fourth	209	86	70	51	2.9	2.3	4.3	2.0	18.7	11.6	31.4	11.8
Fifth or Higher	135	70	39	24	3.0	2.9	5.1	0	14.1	11.4	12.8	16.7

¹ Includes sixteen pregnancies for women whose income was not reported.

² Adjusted to the percentage distribution of live births in New York City in 1934 by order of birth.

The abortion rate for pregnancies of the third and fourth order combined in this low-income group was significantly higher²⁰ than the rates at other orders of pregnancy and also significantly higher than the abortion rate at the same orders of pregnancy for the other income groups. Apparently, within this low-income group, there are a considerable number of women who have resorted to illegal abortion as a method of family limitation, since it has been noted that differences in abortion rates according to parity and according to income were found almost entirely in the reported induced abortions.

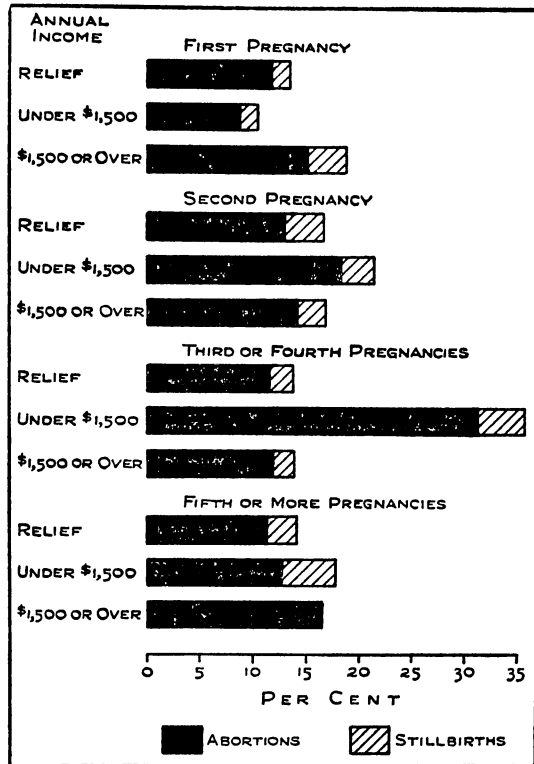


Fig. 3. Pregnancy wastage by order of birth and family income for the two most recent pregnancies prior to the birth reported in the morbidity survey in New York City, 1935-1936.

SUMMARY

The extent of pregnancy wastage in New York City was investigated by having a nurse interview a series of women to obtain detailed records of their entire reproductive history. The 860 women visited in their

²⁰ Differences and the probable error of the differences between abortion rates for selected groups showing the more significant differences were:

1. Order of birth differences for women in families with annual incomes under \$1,500:	
Third and fourth pregnancy and first pregnancy	22.7 ± 3.44
Third and fourth pregnancy and second pregnancy	13.1 ± 4.55
Third and fourth pregnancy and fifth or higher pregnancy	18.6 ± 5.82
First and second pregnancies	9.6 ± 2.83
2. Income group differences for pregnancies of third and fourth order:	
Under \$1,500 and relief	19.8 ± 4.38
Under \$1,500 and \$1,500 or more.	19.6 ± 5.23

homes in 1936 had reported a recent pregnancy termination of some type when canvassed in the course of the Chronic Disease Survey conducted by the United States Public Health Service. Since these recent or current survey pregnancies included relatively few previsible terminations, the major analysis is restricted to the outcome of 1,595 previous pregnancies of the 595 multiparous women, of whom 549 were white and forty-six were Negro or other colored. Since the latter were so few and showed no significant difference from the white group, results for the total sample were presented.

1. Eighty-five per cent of all previous pregnancies terminated in live births, 2.6 per cent in stillbirths, and 12.1 per cent in abortions, including 3.1 per cent which were reported as induced. Slightly higher abortion rates were indicated when only the two pregnancies which had most recently preceded the survey pregnancy were considered, in order to limit the time range covered in the histories and to give equal weight to the individual women. On this basis, 83 per cent of pregnancies resulted in live births, 2.7 per cent in stillbirths, and 14.5 per cent in abortions, including 3.9 per cent which were induced. Internal evidence suggests that some induced abortions were reported as spontaneous and that the proportion of induced terminations should be slightly higher.

These abortion rates are much lower than most estimates which have been made for New York City. Although there is some selection in this sample toward a minimum rate, it is believed that the records of women definitely interested in family limitation and attending birth control clinics have led to an estimate for abortions which is excessively high.

2. Data from several studies of pregnancy wastage were reviewed and it was suggested that a fairly constant proportion of pregnancies results in stillbirths or spontaneous abortions, probably 11 or 12 per cent.

3. Loss from abortions was somewhat lower among first pregnancies than among those of higher orders, but there was no con-

sistent tendency for the abortion rate to increase as order of pregnancy advanced. The highest abortion rate was reported for the third pregnancies and the excess was almost entirely accounted for by a high rate of induced abortions.

4. Differences in the rates for spontaneous abortion according to family income in 1935 were not significant, but the women in families with an annual income of less than \$1,000 reported a higher percentage of pregnancies terminated by induced abortion than any other income group. There was a slight tendency for spontaneous abortions to increase as income increased and a more definite tendency for induced abortions to decrease as income increased.

5. A very high abortion rate (31 per cent) for third and fourth pregnancies of women in the low-income group was noted. Only in the low-income nonrelief group did the pregnancy loss vary significantly by order of birth.