

MATERNAL AND INFANT MORTALITY IN 4488 CASES IN
AN OUTDOOR CLINIC, 1922-1925*

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(From Cornell University Medical College in affiliation with the John E. Berwind
Free Maternity Clinic)

THE methods of compiling maternal mortality figures differ in the various states and countries but the international code, accepted by the United States and several countries of Europe, is the best system that we have at present for recording the deaths. The maternal mortality figures for the United States are computed from the so-called Registration Area, which now consists of thirty-nine states and the District of Columbia. All but three of the southern states are included in this group, a fact that is important because the mortality in the colored women is nearly twice as high as in the white. The colored women are notably ill-constituted to bear the trials of pregnancy and labor because of their poor nutrition and the high incidence of rickets, tuberculosis and syphilis. In some regions, the latter disease affects more than a third of the women. Furthermore they are delivered by untrained midwives under conditions that lead to infection. To show how markedly these factors affect the rate, the 1922 figures of the Department of Commerce give a combined maternal death rate of 10.7 per cent for South Carolina, whereas Minnesota which has an almost entirely white population with high standards of education, has a rate of 4.9 per cent. Notwithstanding the high death rate in the colored women, the figures for the United States are close to those of Great Britain, the country with which we may most readily be compared.

TABLE I
MATERNAL MORTALITY—ENGLAND, SCOTLAND, WALES AND THE UNITED STATES,
1921, 1922

	CRUDE RATE				ADJUSTED RATE*			
	Eng. Scot. Wales		United States		Eng. Scot. Wales		United States	
	1921	1922	1921	1922	1921	1922	1921	1922
All puerperal causes	8.1	7.2	6.6	6.5	6.9	6.0	6.7	6.6
Puerperal sepsis	3.5	2.5	2.6	2.3	3.2	2.2	2.6	2.3
Other puerperal causes	4.6	4.7	3.9	4.2	3.7	3.8	4.0	4.3

*Adjusted rate on basis of standard 1,000,000 live births of 1917.
(Figures obtained from census report.)

There is an element of injustice in the contention that the United States is seventeenth on the list of civilized countries in their maternal mortality rate. In order to make a comparison with other countries their methods of collecting and compiling their statistics must be thoroughly investigated, otherwise we find Russia presenting very

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low figures that can hardly be in conformity with the actual facts. There is so much free talk about statistical figures that one should view them with skepticism.

I present here the results of our attempt to reduce maternal deaths. The circumstances and conditions that arise in an outdoor delivery clinic are not very different from those confronting the general practitioner, and our work is described with the hope that certain applicable features may be adopted by him.

At the close of the year 1921, Cornell University Medical College formed an affiliation with the John E. Berwind Maternity Clinic,—an organization that had been giving maternity care for the past twenty years,—by which the medical control passed to the former institution. We have, therefore, four years, 1922 to 1926, in which the

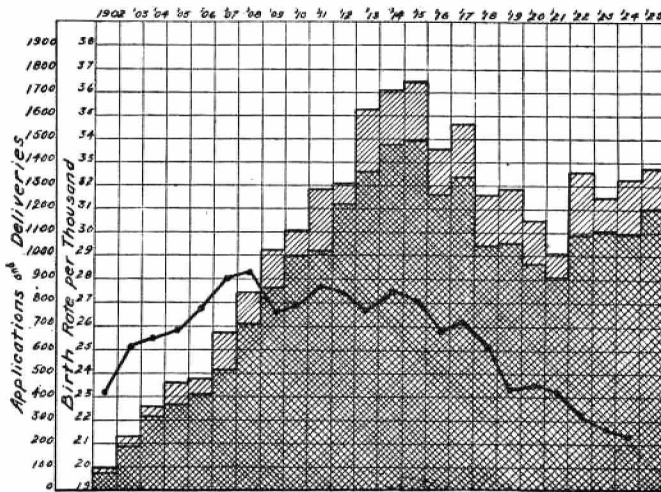


Fig. 1.—John E. Berwind Free Maternity Clinic, 1902-1925.
Dark Area: Deliveries. Light Area: Applications. Dotted Line: Birth Rate in New York City per 1,000 Population.

clinic has been a teaching service for the Cornell Medical School and it is here that the fourth year students have obtained their practical work. This clinic is housed in a suitable building with quarters for the students and has a resident staff of four men. There are twelve nurses, including those in the maternity and infant divisions. The clinic is aided to some extent by the Henry Street Settlement whose nurses make some 4000 visits a year.

At the present time it is exceedingly difficult for any institution to keep up the number of deliveries in its outdoor clinic because, first, there is an increasing tendency for the women to seek hospital care and, secondly, due to the high cost of nursing service, the patients find it less expensive to have a private doctor than to have clinic care. We have decided that this latter cause shall not be operative in our clinic and as a result we have had a gradual but steady growth, although the birth rate in New York City is constantly decreasing.

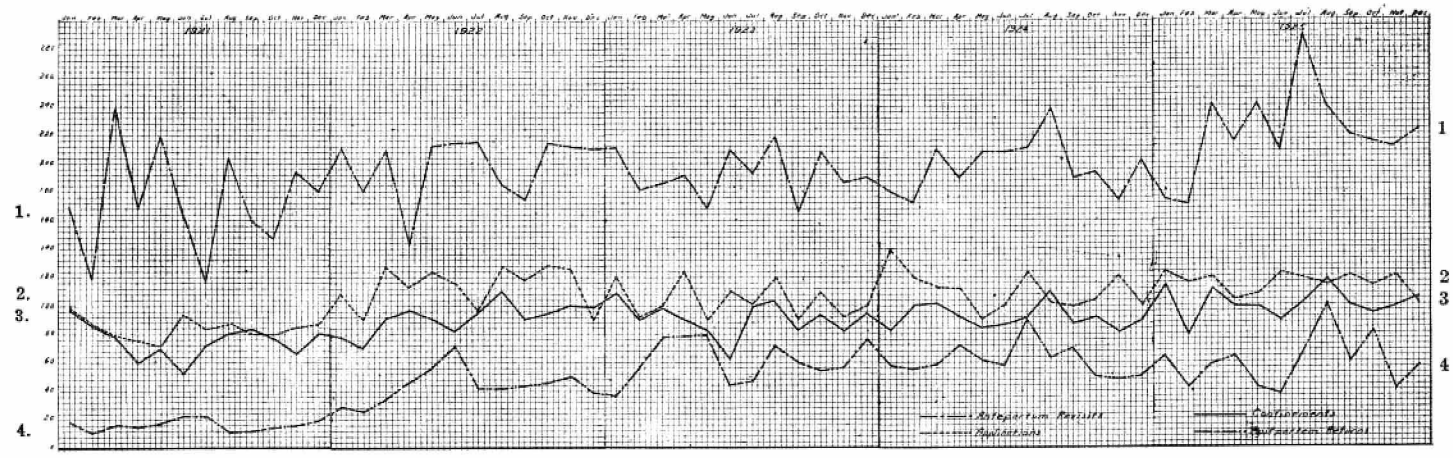


Fig. 2.—John E. Berwind Free Maternity Clinic, 1921-1925.

Chart Showing Variations in the Clinic Activities. Line 1. Number of antepartum revisits. 2. Number of applications. 3. Number of confinements. 4. Number of postpartum return visits.

Our postpartum follow-up visits are approaching the number of deliveries and the deliveries themselves are close to the applications. The total number of visits for the four years—antenatal, natal and postnatal—is 74,207; 19,294 were made by doctors and students, 41,125 by nurses and 13,788 antenatal and postnatal visits were made by the patients to the clinic. Most of the women apply for care about the seventh month, a factor that must be remembered when a study is made of our mortality figures which are lowered by the absence of deaths from abortion, ectopic pregnancies and accidents of the early months.

In addition to the antenatal and delivery care, there is a follow-up clinic and cases requiring operative repair are transferred to another of our teaching hospitals. At the end of two weeks the babies are transferred to the Pediatric Department of the clinic where they are cared for throughout one year. Forty-five per cent of our patients by actual count, are either colored or Porto Rican and, as we have pointed out, the negress is a poor maternal risk.

The principal idea of this service and the one that is applicable to general practice was ably described by A. C. Beck in his paper published in this Journal in 1923 and we believe that its adoption should be encouraged. This is that all major abnormalities should be transferred to a hospital, if possible before interference. The outdoor department of our clinic stands in relationship to a hospital that is ready to receive at all times the abnormal and emergency cases that arise in the course of the service. All major abnormalities are transferred, if possible before interference or even before labor. At first thought it might seem that this plan, if adopted by the general practitioner, would make him little more than a male midwife but the actual results show that he would still have a considerable number of operative cases. Although our maternal mortality figures are low, we believe that they could be further reduced if we had ambulance facilities to make our own transfers. As we have not been able to do this, a few of the cases have been admitted to hospitals not under our control. Our follow-up, however, includes these patients.

Students, under the direction of the resident, are permitted to make vaginal examinations, but unnecessary and repeated examinations are discouraged. Rectal examinations are not made as we believe they tend to increase sepsis through the mechanical raising, by the probing finger, of the lower part of the vaginal tract toward the open cervix. At the end of two weeks, the student usually has fourteen deliveries to his credit. In at least one-half of these he has delivered the patient himself and in the remainder he has acted as assistant. In addition to his delivery work he has attended the prenatal clinics and made postpartum calls on the patients that he has delivered.

TABLE II
BERWIND MATERNITY CLINIC FORCEPS DELIVERIES IN 4488 CASES, 1922-1925

	1922	1923	1924	1925
High Forceps	8	8	12	4
Mid Forceps	18	29	16	21
Low Forceps	14	4	19	13
Total Forceps Deliveries	166.			
Infant Deaths	23	(2 Macerated).		
Maternal Deaths	0.			

The operative work in the outdoor cases consists almost entirely of forceps deliveries, versions and procedures for the control of hemorrhage and is conducted by the resident in the presence of a member of the visiting staff. Cases for cesarean section and antenatal bleeding cases are transferred to a hospital.

In our 4488 cases there were 164 forceps procedures or an incidence of 3.6 per cent. No mothers died. The infant death rate was 12.6 per cent; but for the mid and low forceps operations it was 7.8 per cent. Perhaps some criticism might be directed toward the frequency of high forceps operations, especially as the infant death rate was 25 per cent. For the most part there were no versions following attempts at forceps delivery as we are convinced that this is not a proper procedure. Every emergency hospital receives from the outside a number of cases of ruptured uteri that are the result of version following forceps procedures. However, in an outdoor service it occasionally seems necessary to do a version after an attempt at forceps and in our few operations of this type we were fortunate in having no accidents. Our only case of ruptured uterus was one of multiple pregnancy in which the first twin was delivered by low forceps and the second by version and breech extraction.

TABLE III
BERWIND MATERNITY CLINIC BREECH DELIVERIES IN 4488 CASES, 1922-1925

	1922	1923	1924	1925
Version and Breech Extraction	19	16	13	14
Breech Extraction	2	12	8	13
Spontaneous Breech	20	38	34	37
Total Breech Deliveries	226.			
Infant Deaths	35	(7 Macerated).		
Maternal Deaths	0.			

There were 62 versions and breech extractions and, excluding macerated fetuses, the total infant mortality was 27 per cent. If these deliveries are combined with the breech extractions and the spontaneous breech deliveries, there is a total of 226 cases with a 12 per cent infant death rate.

We encountered 150 contracted pelves. Five of these cases were transferred to the hospital for cesarean section. In the remainder there were three high forceps, seven mid and low forceps and four versions. Two mothers died; one, after transfer for a cesarean sec-

TABLE IV
BERWIND MATERNITY CLINIC ABNORMALITIES AND COMPLICATIONS IN 4488 CASES, 1922-1925

	NO. OF CASES	MATERNAL MORTALITY		NO. OF CASES	MATERNAL MORTALITY
Forceps	167 (3)	0	Toxemia	69 (13)	1
Version and Breech Extraction	62	0	Pyelitis	6	0
Breech Extraction	35	0	Prolapsed Part	25	0
Cesarean Section	5 (5)	1*	Hydramnios	4	0
Craniotomy	1 (1)	0	Thrombophlebitis	3 (1)	0
Inversion of Uterus	1 (1)	1	Sepsis	10 (9)	1
Rupture of Uterus	1	1	Sapremia	11	0
Placenta Previa	17 (11)	2	Parametritis	8 (1)	0
Premature Separation Placenta	13 (6)	1	Mastitis	16 (1)	0
Postpartum Hemorrhage	17 (4)	1	Tuberculosis	4 (3)	0
Manual Extraction Placenta	16 (3)	2	Pneumonia	2 (1)	1
Eclampsia	9 (7)	1	Cardiac Disease	7	1
			Pernicious Anemia	1	0
	344	10		166	4

*Anesthetic Death.

(Figures in parentheses indicate number of cases transferred to hospitals.)

tion, died from the anesthesia just as the abdomen was opened and the other, from sepsis which followed manual removal of the placenta. In the 150 cases there were 6 infant deaths.

TABLE V
BERWIND MATERNITY CLINIC. INFANT DEATHS IN 4488 CASES, 1922-1925.
RATE 5.2 PER CENT

	STILLBIRTHS	NEONATAL DEATHS
Difficult Labor		
Operative Delivery	36	12
Spontaneous Delivery	2	5
Prematurity and Injury	12	23
Congenital Abnormality	4	13
Maceration		
Death in Utero	51	0
Toxemia and Syphilis	19	0
Placental Abnormality	4	0
Cord Anomaly	9	1
Pneumonia	0	2
Atelectasis	4	6
Miscellaneous	16	16
	157—3.5%	77—1.7%

Many complications have occurred in the 4488 deliveries and we present a summary of them in order to indicate the types of cases that we have felt it desirable to transfer and also to show the end-results. In our own and the transferred cases we had 12 obstetric deaths or 1 in 374 cases,—a rate of 2.67 per 1000 live births and stillbirths. In the cases delivered by the clinic there were 7 deaths or 1 in 641 cases, giving a rate of 1.56 per 1000 live births and stillbirths. In a careful review of the deaths we feel that with improved judgment there might be even a further reduction.

TABLE VI
BERWIND MATERNITY CLINIC
MATERNAL MORTALITY IN 4488 DELIVERIES, 1922-1925

DEATHS FROM MEDICAL COMPLICATIONS	
1 MENINGITIS	1 HEART DISEASE
OBSTETRICAL DEATHS	
<i>After Transfer to Hospital</i> 1 Preeclampsia. (Developed eclampsia at hospital.) 1 Placenta Previa. (Vagina packed before transfer.) 1 Premature Separation of Placenta. (28th week. Transferred without operative interference.) 1 Anesthetic Death. (32 hours labor at home.) 1 Inversion of Uterus. (Delivered out of service. Stopped at Clinic seeking hospital care. Transferred to hospital.)	<i>Actual Mortality at Berwind</i> 2 Manual Removal of the Placenta. 1 Sepsis. (Scarlet fever in family.) 1 Chronic Nephritis and Shock. 1 Placenta Previa. (Delivered in Clinic. Transferred to hospital.) 1 Rupture of Uterus. 1 Postpartum Hemorrhage.

Total Deaths—14 or 1 in 320 cases.
 Obstetrical Deaths—12 or 1 in 374 cases—2.67 per 1000 births.
 Berwind Delivery Deaths—7 or 1 in 641 cases—1.56 per 1000 births.

Our stillbirth and neonatal death rate—5.2 per cent—is not as low as we might expect and it is twice as high as the rate given by Beck in his cases in a teaching service in Brooklyn. We have listed these deaths under their direct causes as far as we could determine them and, as we were fortunate in securing a considerable number of autopsies, we feel that they are properly classified etiologically.

Some degree of infection followed in 48 cases but there were only two deaths, one mentioned above under manual extraction of the placenta and one a case of sepsis occurring in a family in which there were two cases of scarlet fever.

There were 6 complete tears that were repaired at once.

SUMMARY

With close control and adequate facilities a teaching service can be conducted with considerably lower death rate than that generally prevalent in the community. In our cases there is a reduction of 50 per cent below the figures for New York State. The stillbirth and neonatal death rate of 5.2 per cent is more than 30 per cent lower than the figures for New York City. We believe that these low figures are due to the transfer of the major operative cases to suitable hospitals as early in the labor as the complications become evident and to the aseptic technic in the conduct of labor.

119 EAST SEVENTY-FOURTH STREET.