

Special Delivery from SC PRAMS

Infant Mortality in South Carolina: Insight from SC PRAMS, 1992-1997

What is SC PRAMS?

The information for this newsletter was taken from the South Carolina Pregnancy Risk Assessment Monitoring System (SC PRAMS). SC PRAMS is an ongoing survey that obtains information from new mothers four to six months after delivery. Selected mothers are mailed a survey up to three times. Telephone interviewers attempt to reach the mothers who did not respond to the mail survey.

About 2,100 mothers are randomly sampled from the state's live birth registry each year. Low birth weight infants (less than 5 ½ pounds at birth) are over-sampled because we need to learn more about high-risk mothers. After statistical weights are applied, inferences can be made about the health of mothers and babies in SC.

The data presented in this newsletter reflect live births to SC mothers occurring in SC between the years of 1992-1997. The overall response rate for these years was 71% (10,221 out of 14,347 mothers responded).

Background

South Carolina's infant mortality rate, which has been decreasing steadily over the past twenty years, increased to 9.5 deaths per 1,000 live births in 1997 (figure 1). In 1997, 494 infants died before their first birthday in South Carolina (SC), and almost half of these deaths occurred within the first twenty-four hours of life¹. The Healthy People 2000 Objective calls to reduce the infant mortality rate to no more than 7 per 1,000 live births². SC still has some work to do in order to reach this goal.

Before any progress can be made, it is important to examine the factors which are closely associated with infant mortality such as maternal health, access to quality prenatal care, environmental factors, and socioeconomic status³. This newsletter addresses the characteristics and behaviors of those mothers in SC who lost an infant during the first year of life.

Methods

PRAMS data were linked with the SC infant death files for the years of 1992-1997. Because the PRAMS survey over-samples on low birthweight, a large proportion of infant deaths are captured in the PRAMS sample. We assessed the characteristics of the mothers whose infants died who answered the PRAMS survey. Because we already know the demographics of women that are more likely to experience infant deaths, this newsletter focuses on information which is unique to the PRAMS survey. Mothers whose infants died were compared with mothers whose infants lived on the following characteristics: race, education, marital status, age, hospitalizations, pregnancy intention, birthweight, prenatal care, poverty level, smoking status, WIC and Medicaid status, partner abuse, and reproductive history. Chi-square tests were performed to determine if women with deceased infants and women with living infants differed significantly on the above mentioned variables.

Results

The number of women whose infants died and the number of those women who were surveyed, along with their response rates, are shown in Table 1 for the years 1992 through 1997. PRAMS surveyed between 47-54% (not including 1992) of all infant deaths in SC, and the response rate among women whose infants died ranged from 60-67%. PRAMS information was collected on 821 women representing 27.2% of all mothers whose infants died before one year of age in SC from 1992-1997.

Table 1. Women whose Infants Died who were Included in the PRAMS Sample, 1992-1997

	1992*	1993	1994	1995	1996	1997	Total
Infant Deaths in SC	588	544	486	480	424	494	3016
Number of women whose infants died that were surveyed	86	281	245	244	229	232	1317
Percent of women whose infants died that were surveyed	14.6%	51.7%	50.4%	50.8%	54.0%	47.0%	43.7%
Number of women whose infants died that responded	46	183	148	151	154	139	821
Response Rate for women whose infants died	53.5%	65.1%	60.4%	61.9%	67.2%	59.9%	62.3%

*1992 was a partial year for PRAMS.

Certain populations of women are more likely to experience loss of an infant during the first year of life. For the years 1992 through 1997, the infant mortality rate was significantly higher among mothers who were black ($p=.0065$), unmarried ($p=.0244$), and had a less than high school education ($p=.0135$) compared to women without these characteristics (table 2). In Table 2, it is shown that the proportion of mothers in the less than 18 year age group and the 18-24 year age group was higher among mothers of deceased infants than among mothers of living infants (13.0% vs. 7.3% and 45.1% vs. 37.7%, respectively).

Experiences during pregnancy were different for women whose infants died than those without an infant death. For the years 1992-1997, the proportion of women who were **hospitalized during pregnancy**, excluding delivery, was twice as high for women whose infants died (43.5%) compared to women who did not experience infant death (20.0%) (table 2). The most common reasons for being hospitalized during pregnancy among mothers whose infants died were preterm labor and vaginal bleeding. However, vaginal bleeding was the only reason for hospital admission in which the proportion was higher among mothers whose infants died (24.5%) compared to mothers whose infants lived (10.0%).

Adequacy of **prenatal care** varied greatly by infant death status. While almost one-half (45.5%) of all mothers whose infant died received adequate plus prenatal care, which is indicative of a high-risk pregnancy, 24.7% of mothers with an infant death received inadequate prenatal care (figure 2). This proportion was almost twice as high as the proportion of mothers without an infant death who received inadequate prenatal care (14.7%).

Pregnancy intention did not differ by much between mothers whose infant died and those without an infant death. Mothers of deceased infants were slightly more likely to report an unwanted pregnancy (14.2%) than mothers who did not experience infant death (12.3%) (figure 3). Mothers who experienced an infant death were also more likely to be unsure about intent or to leave the question blank (9.9%) compared to mothers whose infants are living (6.0%).

Mothers who had an infant to die were slightly more likely to be **on WIC during pregnancy** (62.5%) compared to mothers without an infant death (55.8%) (table 2). Women who were **on Medicaid during pregnancy** were significantly more likely to experience an infant death compared to non-Medicaid women ($p=.0272$). Sixty-four percent of mothers who lost an infant were on Medicaid compared to only 53% of mothers who did not lose an infant (table 2).

A greater proportion of mothers with infant deaths **smoked** during their pregnancy compared to mothers without an infant death. Almost one-quarter (23.6%) of mothers who lost an infant during the first year smoked while pregnant. The proportion of mothers with **previous low birthweight** infants and **previous preterm** deliveries was about twice as high among mothers with an infant death (25.6% and 23.4%) compared to mothers whose infant did not die (11.6% and 13.0%, respectively). A much greater proportion of mothers who experienced an infant death had two or more **terminations of a previous pregnancy** (12.2% compared to 6.5% of mothers without an infant death). However, previous terminations have not been found to be associated with pregnancy outcome after adjusting for other factors.

Figure 4 shows the **birthweight distribution** among infants who died during the years 1992-1997. Almost 22% of infants who died weighed less than 500 grams at birth, and about one-half of the infant deaths weighed between 500 and 2499 grams. Twenty-nine percent of all infant deaths were normal birthweight babies (2500 grams or more), whereas 92% of living infants were normal birthweight. There were no infants weighing less than 500 grams at birth who survived, and only 1.2% of the very low birthweight (500-1499 grams) babies lived.

Infant mortality did not vary much by **poverty status** (table 2). Seventy percent of mothers with an infant death were less than 185% of the poverty level compared to 64.4% of mothers without an infant death. **Physical abuse** during pregnancy was also not found to be associated with infant mortality. The proportion of women who were abused by their partner during pregnancy was 6.4% for women

who experienced an infant death and 6.5% for women without an infant death.

Discussion

Factors associated with infant mortality differed greatly by maternal race. When chi-square analyses were run separately for black and white women, the only common characteristic significantly associated with an infant death was having a birthweight of less than 2500 grams. For black mothers, poverty status was associated with an infant death ($p=.0470$). Over 50 percent of the infant deaths to black women occurred to the poorest group (<100% of the poverty level). Quality of prenatal care was also significantly associated with infant deaths for black mothers ($p=.0005$). Almost 26 percent of the black women with infant deaths received inadequate prenatal care.

Infant mortality did not differ by poverty status or adequacy of prenatal care among the white mothers. The factors significantly associated with infant mortality among the white mothers included low education level ($p=.0173$), being on Medicaid during pregnancy ($p=.0361$), and smoking during pregnancy ($p=.0305$).

One significant limitation to this analysis is that information on infant smoke exposure and sleep position could not be collected on the majority of infant deaths. This is because the PRAMS survey includes a skip pattern for these questions if the mother indicates that her infant has died. Because most of the babies died before they left the hospital or shortly after, there is no way to collect information on these environmental and social factors. Another limitation to the study is that the women who experienced an infant death were less likely to respond to the PRAMS survey. In 1997, the overall response rate was 74.0% compared with a response rate of 59.9% among mothers of deceased infants. This could have diluted or even masked some of the characteristics and behaviors associated with having an infant death.

Conclusion

The objective of this newsletter was to highlight characteristics and behaviors which were more common among mothers with infant deaths. It is already known that certain groups of women are more likely to experience an infant death. Mothers who are black, less than 18 years of age, unmarried, and have a less than high school education are at greater risk of having an infant die within the first year of life compared to mothers without these characteristics. Low birthweight and receiving inadequate prenatal care are also factors which are significantly associated with infant mortality. Prenatal care is necessary in order to better prepare for a healthy pregnancy and delivery. We have a good idea which women are more likely to experience an infant death, and since we also know that many of these women receive inadequate prenatal care, efforts need to be focused on getting these mothers in for quality prenatal care during the first trimester.

References

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3. National Center for Health Statistics. Health, United States, 1998 With Socioeconomic Status and Health Chartbook. Hyattsville, Maryland: 1998.

Acknowledgments

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We would like to express special thanks to the members of the PRAMS Steering Committee for their guidance in this endeavor.

Funding for the PRAMS Program is provided by the Center for Disease Control and Prevention, Atlanta, GA (Grant No. U50/CCU613668)

Figure 1. South Carolina Infant Mortality Rate, 1989-1997

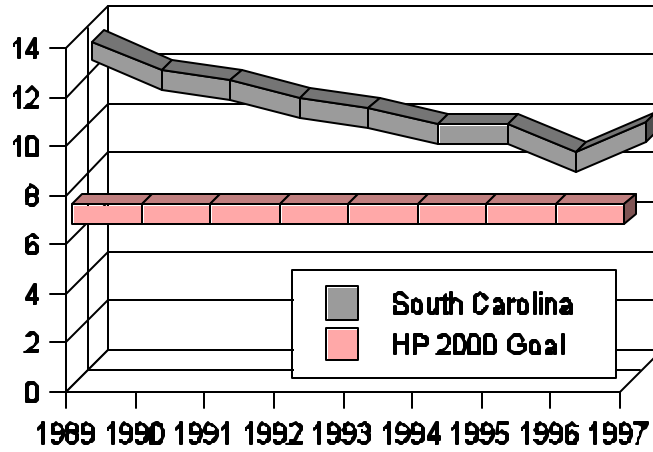


Figure 2. Adequacy of Prenatal Care by Infant Death Status: 1992-1997

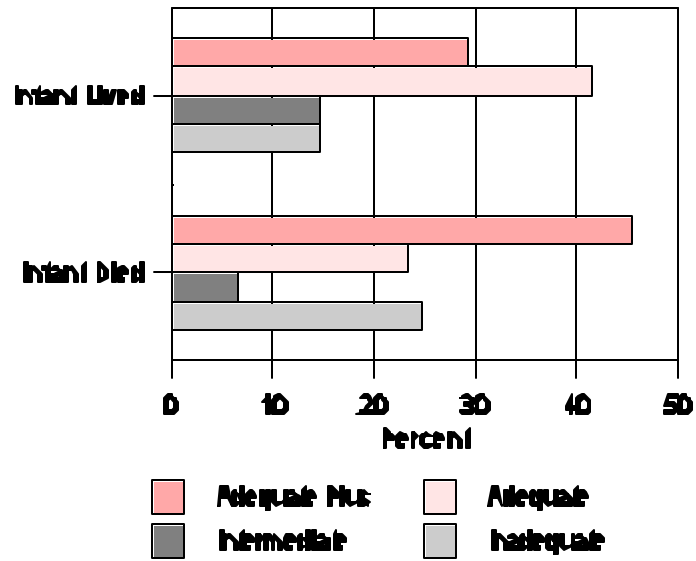


Figure 3. Pregnancy Intention by Infant Death Status: 1992-1997

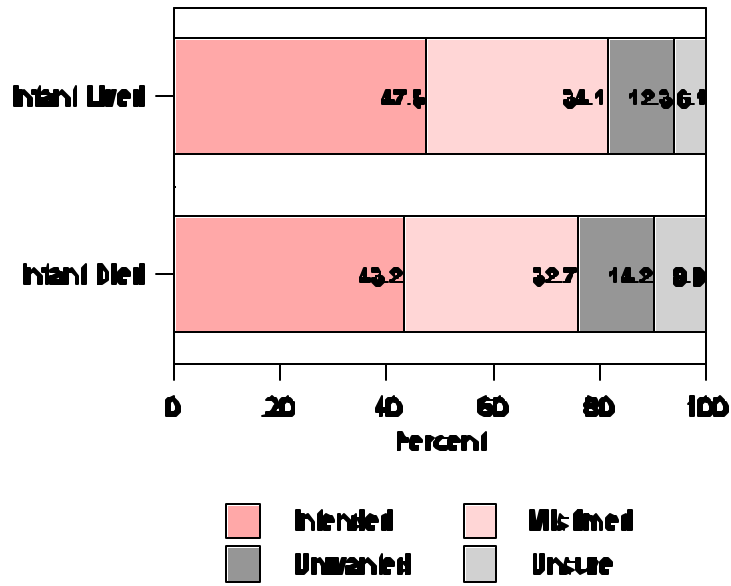


Figure 4. Birthweight Distribution among Infant Deaths: 1992-1997

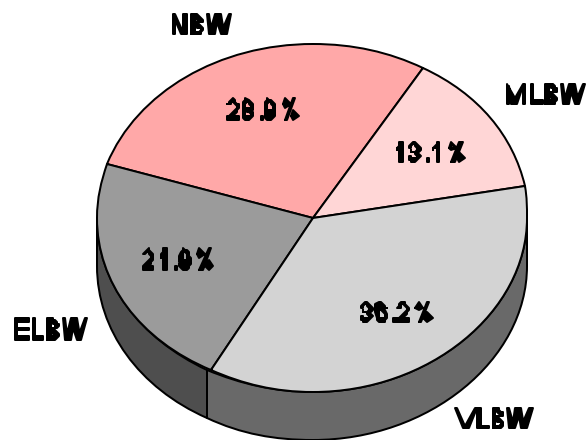


Table 2. Maternal Characteristics for Women with Infant Deaths and Women without an Infant Death, 1992-1997

Characteristics	Mothers of Deceased Infants	Mothers of Living Infants	P value
	Percent (Standard Error)		
Race			
Black	51.5 (4.6)	38.1 (0.7)	p=.0065
White	48.5 (4.6)	61.9 (0.7)	
Education			
Less than HS	35.0 (4.6)	21.7 (0.6)	p=.0135
Completed HS	39.4 (4.5)	39.2 (0.7)	
More than HS	25.6 (4.2)	39.1 (0.7)	
Marital Status			
Married	50.9 (4.5)	61.7 (0.7)	p=.0244
Unmarried	49.1 (4.5)	38.3 (0.7)	
Maternal Age			
Less than 18 years	13.0 (3.1)	7.3 (0.4)	p=.0293
18-24 years	45.1 (4.6)	37.7 (0.7)	
25-34 years	32.2 (0.7)	46.0 (0.7)	
35-55 years	9.7 (3.6)	9.0 (0.4)	
Hospitalized during Pregnancy	43.5 (4.6)	20.0 (0.6)	p=.0002
Pregnancy Intention			
Intended	43.2 (4.3)	47.6 (0.7)	NS*
Mistimed	32.7 (4.3)	34.1 (0.7)	
Unwanted	14.2 (4.0)	12.3 (0.5)	
Unsure/Missing	9.9 (2.4)	6.0 (0.3)	
Birthweight			
ELBW (<500g)	21.9 (2.1)	0.0 (0.0)	p<.0000
VLBW (500-1499g)	36.2 (3.3)	1.2 (0.0)	
MLBW (1500-2499g)	13.1 (2.3)	6.8 (0.0)	
NBW (2500g+)	28.8 (6.2)	92.0 (0.0)	
Prenatal Care**			
Inadequate	24.7 (4.4)	14.7 (0.5)	p=.0004
Intermediate	6.5 (2.6)	14.6 (0.5)	
Adequate	23.3 (4.6)	41.5 (0.7)	
Adequate Plus	45.5 (4.6)	29.2 (0.7)	
Poverty Index			
<100% (poor)	41.4 (5.4)	40.5 (0.8)	NS*
100-185% (near-poor)	28.8 (4.9)	23.9 (0.7)	
>185% (non-poor)	29.8 (5.2)	35.6 (0.8)	
Smoked during Pregnancy	23.6 (4.5)	13.9 (0.5)	NS*
On WIC during Pregnancy	62.5 (4.6)	55.8 (0.7)	NS*

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On Medicaid during Pregnancy	64.4 (4.6)	53.4 (0.7)	p=.0272
Partner Abuse during Pregnancy	6.4 (1.6)	6.5 (0.6)	NS*
Previous LBW Infant	25.6 (5.0)	11.6 (0.6)	p=.0086
Previous Premature Infant	23.4 (3.5)	13.0 (0.7)	p=.0007
Previous Terminations			
None	70.4 (4.3)	74.5 (0.7)	
One	17.4 (3.8)	18.9 (0.6)	NS*
Two or More	12.2 (2.6)	6.5 (0.3)	

*Not significant

**Based on the Kotelchuck Index

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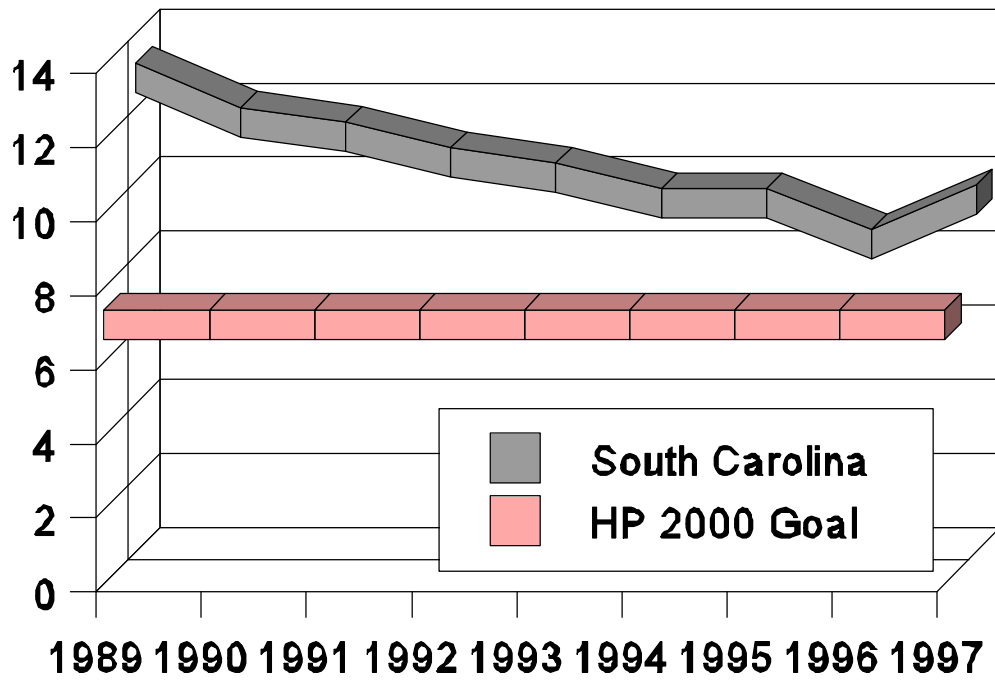


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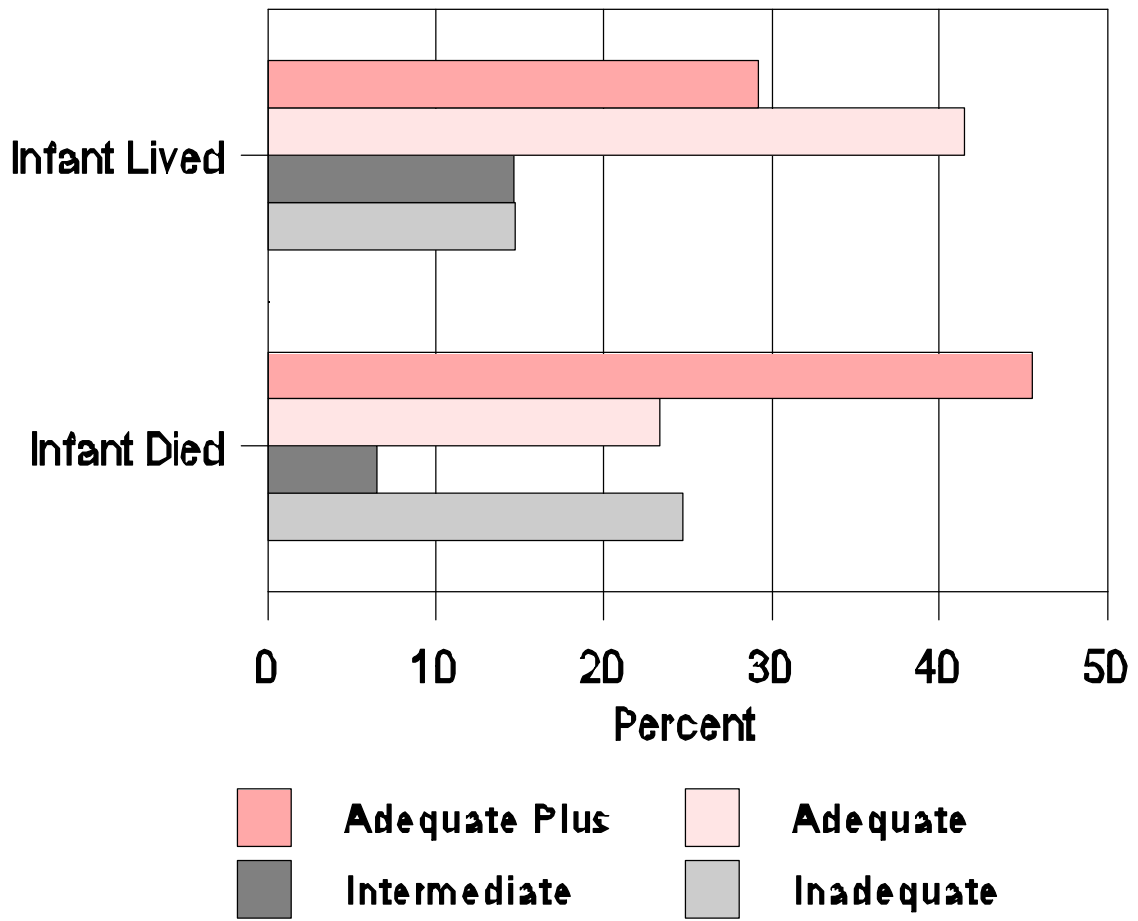
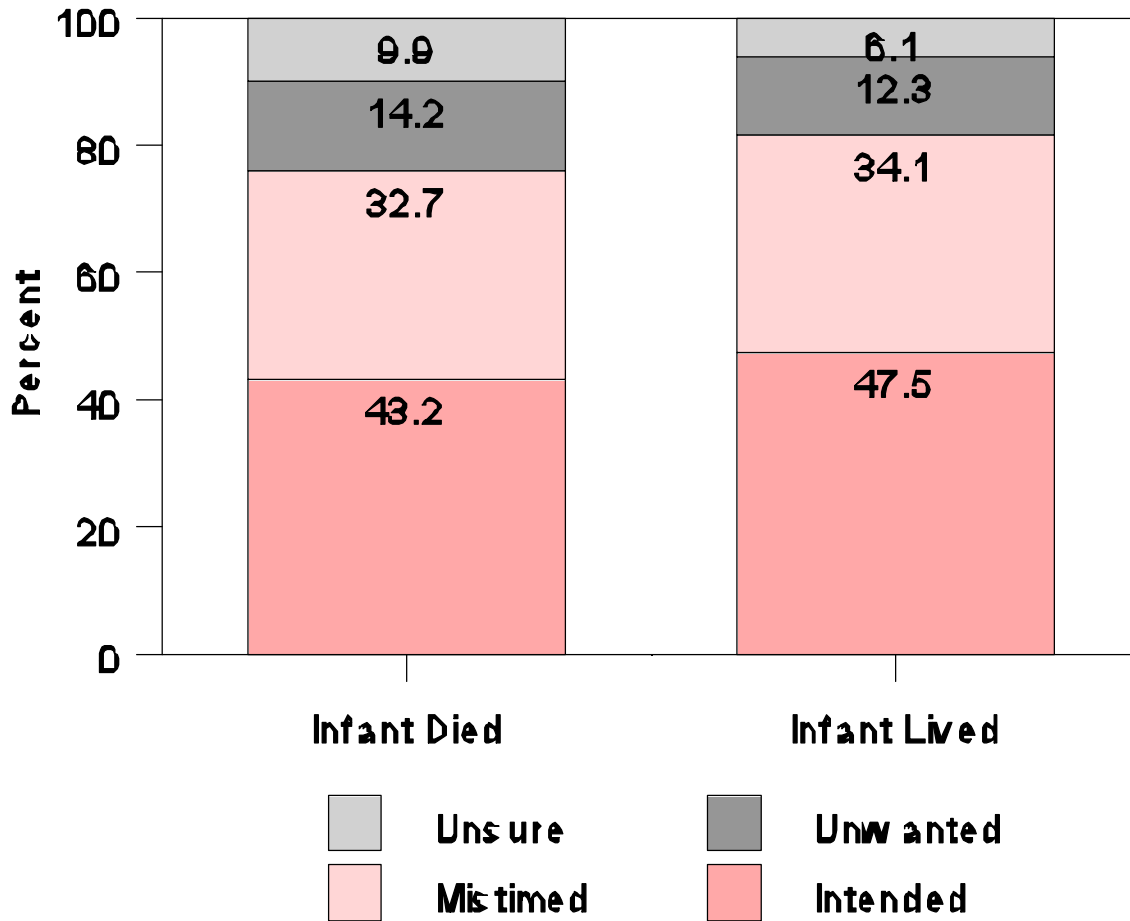


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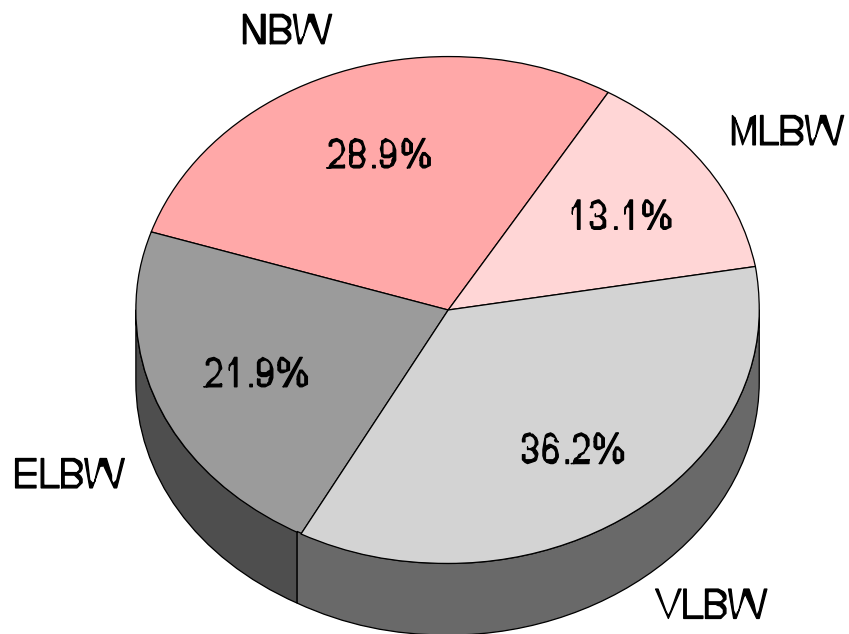


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Two or More	12.2 (2.6)	6.5 (0.3)	

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