

# We Know Less Than We Think We Know About Perinatal Outcomes

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Most of what we think we know about survival rates for infants born at 22 or 23 weeks' gestational age is probably wrong. It is wrong because of some well-recognized but oddly persistent quirks in the ways that outcome data are collected and reported. Here are some of those quirks:

1. Outcome statistics are reported for all live births regardless of whether the infants received any active interventions aimed at keeping them alive. For example, Rysavy et al<sup>1</sup> reported that for infants born at 22 weeks in the United States, overall survival was 5%, but survival among infants who received active treatment was 25%. Many people and professional societies interpret those results as revealing that the actual survival rate for such infants is 5% regardless of whether attempts were made to resuscitate and save the infants.<sup>2</sup> In fact, we simply don't know what the survival rate would be if resuscitation were offered or provided to all infants.<sup>3</sup>
2. Selective initiation of life-sustaining treatment is reported for infants who are thought to have a more favorable prognosis. Atwell et al<sup>4</sup> report in this issue of *Pediatrics* that in Australia and New Zealand, infants born at 23 weeks are more likely to be admitted to the NICU and treated if they weigh >500 g or are female. Higher birth weight and female sex are factors that are thought to improve prognosis. This selective initiation of treatment likely leads to overestimates of achievable survival rates for all

infants. Again, we don't know how erroneous the reported results might be.

3. Different centers and different countries use imprecise or idiosyncratic definitions of stillbirth. In some countries, any infant born at <24 weeks or 500 g is classified as a stillbirth, even if the infant was born with signs of life. In other countries, any infant born with a heartbeat or respiratory effort, regardless of birth weight or gestational age, is considered a live birth. These differences would alter the number of live births and might lead to an overestimate of actual survival rates in countries that classify all infants born at 23 weeks as stillbirths.<sup>4,5</sup>
4. Finally, different centers take different approaches to active obstetrical management at low gestational ages. Some antenatal interventions, like antenatal steroids, probably lead to better outcomes. If authors of reported outcomes do not distinguish infants whose mothers received steroids from those whose mothers did not, it could lead to worse reported outcomes than would be achieved if steroids were routinely administered. But we don't know the magnitude of the likely change.

These inaccuracies and misrepresentations have real-world effects. They lead to clinical decisions, institutional policies, and national policies in which infants are deemed either viable or nonviable. Infants who are deemed nonviable are, of course, not treated, and the prediction of

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nonviability becomes a self-fulfilling prophecy. Alternatively, some centers or some countries change their policies, treat nonviable infants, and report better outcomes than are reported in many studies. At some such centers, survival rates for infants born at 22 weeks are >30%.<sup>6</sup> Survival rates for infants born at 23 weeks are >50%.

The solution to these inaccuracies is easy. There should be a standard way of reporting perinatal outcomes. The denominator should be every fetus that is alive at 20 weeks. Outcomes would then include (1) termination of pregnancy, (2) intrauterine fetal demise, (3) stillbirth (with reports of whether a heartbeat was present at birth), (4) survival, and (5) neurodevelopmental impairment. Such an approach has been recommended by several prominent perinatal epidemiologists.<sup>7,8</sup> Such data, if standardized and reported,

would avoid the sorts of selection bias reported by Atwell et al<sup>4</sup> as well as the other sorts of biases noted above. It would allow us to avoid misinforming parents and allow clinical decisions for premature infants to be based on solid facts.

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