Editorial

Are the Observed Mortality and Length of Stay Disparities for Uninsured Neonates Real?

The finding by Morriss of an increased risk of death for uninsured infants needs to be carefully investigated (Morriss 2013). The analysis by Morriss has carefully tried to rule out possible explanations for this disparity, to the extent that the data allow, and the results are robust to the alternate models tested. While the data used for the analyses do not have sufficient information to identify the causes of the disparity, it is quite likely that there are multiple causes. There is an urgent need to identify these causes so that we can design policy interventions to correct the problem.

The most disturbing finding by Morriss is that the results are essentially unchanged whether hospital-fixed effects are included or excluded. This means that the disparity is due to within hospital differences in the care that the uninsured receive, as opposed to the uninsured being more likely to go to hospitals with worse outcomes. Does this mean that hospitals are systematically treating the uninsured differently? Or, are there other factors that cannot be discerned with the data used that explain why the uninsured have higher mortality? In his discussion, Morriss raised several factors that need further consideration. This commentary expands on some of those ideas.

Before considering the mortality disparities, one needs to acknowledge the limitations of secondary data, especially when using national datasets. These limitations are underscored by the difference in the results between Model 1 in Table 2 and Appendix Table 1. Model 1 only includes an indicator variable for “preterm, low birth weight, or intrauterine growth retardation,” while the Appendix model includes direct controls for birth weight. The birth weight controls are not included in the main model because they are available for only a subset of the states. This is a very important data

limitation, as mortality risk is very sensitive to gestational age and birth weight (Abdel-Latif, Kecskes, and Bajuk 2013), and most infants in the broad group that Morriss is able to use for the entire sample have essentially no added mortality risk. Appendix Table 1 reports a modified version of Model 1 that includes controls for birth weight and was estimated in a restricted sample of states that include birth weight data. For this model, the odds ratio for the uninsured drops to 2.14. The odds ratio for uninsured for Model 1 in the restricted sample is 2.66, compared to 2.58 in the full sample. Thus, we know that just this one data limitation is causing a 24 percent increase in the odds ratio for the uninsured. The remaining disparity is large and statistically significant, but this comparison clearly points to the fact that we need to carefully consider the data limitations and possible causes of the observed insurance disparity. While some of these data limitations can be addressed in richer secondary data that are available from many states, other data limitations will require moving beyond secondary data.

The data that Morriss used did not include all of the factors that may account for the mortality disparity. First, one needs to consider the possibility of differential treatment by insurance status. It is unlikely that providers are systematically providing different care to patients in the same units, just based on their insurance status. Morriss examined this issue. Table 4 shows that the differences in charges per day are very small. Similarly, the differences in the use of procedures (exclusive of neonates who died) are also fairly small. Thus, the evidence points to no systematic differences in the direct care provided, conditional on patient need.

The article also examines total charges, another measure of treatment intensity. While there are large differences in mean charges, as reported in Table 4, the regression reported Appendix Table 5 shows that controlling for other factors, the average hospital charges for the insured are only \$90 more than for the uninsured. It is also clear from several different tables that what is driving the difference in charges are differences in survival and length of stay.

Taken together, the charges and charges per day results indicate little, if any, disparity in treatment intensity. The differences that Morriss finds are small, and we know that there are differences that are unobserved in the data. Furthermore, one must consider that because the uninsured are paying directly for their care, to the extent possible, they will push for lower treatment intensity when options exist.

The analyses do find considerable insurance disparities in both length of stay and mortality; these are likely to be at least partially related. It is also worth noting that the length of stay disparity is driven by the non normal

newborns, the roughly 10–12 percent of newborns who require intermediate or full neonatal intensive care (Phibbs et al. 1996). The most striking disparity is in the lengths of stay for those who died. Considering the actual distribution of lengths of stay for non survivors is informative. Among very preterm infants, about 75 percent of those who die do so in the first 2 days, most within a few hours after delivery.¹ There is then a very long tail, with a significant share of these very preterm infants having fairly long stays before they eventually die. For larger infants, the distribution is more uniform, but there is an increased share of early deaths. The huge disparity among lengths of stay for those who expire indicates that the uninsured are disproportionately among the early deaths. This points to a factor that may explain a considerable share of the mortality disparity—Medicaid spend-down, which Morris acknowledges. We know that most of the uninsured have low to moderate incomes, but don't qualify for Medicaid (Todd and Sommers 2012). An infant who dies very quickly will not incur large charges, and thus the charges could well be low enough so that it does not make the initially uninsured patient eligible under Medicaid spend-down rules. Conversely, uninsured infants who survive the initial period, but eventually die are almost all infants who are in the NICU and run up large bills, which greatly increases the likelihood of Medicaid spend-down. To the extent that this occurs, Medicaid spend-down could explain at least part of the length of stay disparity among those infants who die as infants with shorter stays are more likely to remain uninsured.

In a similar manner, Medicaid spend-down could also be responsible for much of the mortality disparity because the survival probabilities for very preterm infants increases dramatically after the first 2 days. Thus, among the initially uninsured who are very preterm deliveries, those who die very quickly are much more likely to be classified as uninsured. However, those who survive the first 2 days, with the large associated increase in survival, are much more likely to show up in these data as Medicaid.

The profile of the uninsured cases in the study sample also points to Medicaid spend-down. Based on numerous previous studies, one would expect that the uninsured would be a high-risk population. However, a comparison of the means shows that they are a lower risk population: fewer preterm or low birth weight infants, fewer infants with life-threatening congenital anomalies, and fewer infants who get serious complications. This is consistent with the idea that many of the sickest of the initially uninsured infants become eligible for Medicaid via spend-down and thus, show up in the data as Medicaid instead of uninsured. The infants who remain uninsured are the healthy infants and those who die very quickly. Both these groups incur low charges,

which decreases the probability of Medicaid spend-down. The average risk profile of the uninsured looks healthier as deaths are relatively rare, even among the cases with high-risk profiles.

These aspects of the possible Medicaid spend-down are almost certainly having an effect on the results, but we cannot know how much. The huge difference in the lengths of stay for the non survivors suggests that a big share of these disparities is due to Medicaid spend-down, but this is just a conjecture. This clearly merits additional investigation, but it may be difficult to study because data are needed on expected payment source at the time of admission. Some birth certificates have this information, but the study would be limited to states that also link their birth certificates to discharge records. One would also need to investigate the quality of the expected payor source data. Another possible option could be to obtain data on spend-down and infant age at enrollment from Medicaid data. There may be other ways to get at the Medicaid spend-down issue, which stands out as a priority.

The article by Morriss raises a concern that must be addressed. A careful analysis of the data finds large mortality and length of stay disparities for uninsured infants. While several factors might explain these disparities, these are just informed conjecture. There is an urgent need for additional investigation of these disparities. We need to confirm whether these disparities are real and, if so, there is an urgent need to develop a policy remedy for the problem. While the health care financing reforms that are in the process of being implemented may remedy some of the problems of the uninsured, it is entirely likely that some problems will remain. We cannot design policy remedies until we know what causes the problems.

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NOTE

1. Unpublished data from Phibbs et al. (2007).

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