Maternal morbidity and perinatal outcomes in rural versus urban areas

We commend Lisonkova and colleagues for the breadth of morbidities they included in their article.[1] However, we are disappointed and somewhat astonished over the absence of any attempt to include an analysis of a crucial variable in the discussion: distance to services. This limitation not only weakens the conclusions of the study, but also calls into question the validity of the findings.

The authors note, "The limitations of our study include the lack of individual information on the time needed to travel to the nearest health care facility... ." Although individual information would be ideal, all we need to know is whether birthing women have access to maternity services in their community. This lack of service-level consideration undermines the article. There is strong evidence from British Columbia and internationally that local access to maternity care is an important influence on maternal newborn outcomes.

This lack of attention to distance creates a conceptual shortcoming: the rural group has been defined by its isolation from population centres (i.e., maternity health services), but distance to services (predictor of outcomes) is ignored in the cohort analysis. From previous work with an overlapping data set, we predict that of the 25 855 rural cases, between 4000 and 6000 will be from communities that are more than one hour from the nearest maternity services. This could easily account for the relatively minor differences in the odds ratios for the three principal morbidities (eclampsia, obstetric embolism and uterine scar dehiscence/rupture).

Once distance to services is accounted for, data from BC and Canada show that women from communities without maternity services have poorer outcomes than those from communities with services. Data also show that women from communities with primary maternity care (i.e., no cesarean delivery) and communities where cesarean delivery is provided by family physicians with enhanced surgical skills have outcomes as good as those from communities with obstetricians providing care. To suggest, as the authors do in their conclusion, that in rural communities "the emphasis should remain on monitoring" for those conditions "requiring advanced obstetric and neonatal care" is not only misguided, but also impugns the excellent maternity services being provided in communities that are still offering services.

We question why *CMAJ* published this manuscript. It is a weak cohort analysis that ignores the key health services determinants of outcomes for rural maternity care, but then makes recommendations about the organization of health services. The article presents misleading and potentially frightening data for women in rural areas who are trying to decide where they should give birth. A worthwhile adjustment to the analysis of this data would be to stratify those women according to whether they have a local maternity service in their community, and then examine morbidities. The literature has already demonstrated good outcomes for newborns. We expect that data will show the same for maternal outcomes.

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Reference

1. Lisonkova S, Haslam MD, Dahlgren L, et al. Maternal morbidity and perinatal outcomes among women in rural versus urban areas. *CMAJ* 2016;188:E456-65.

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On behalf of the Society of Rural Physicians of Canada, we believe that the study by Lisonkova and colleagues[1] does a disservice to rural maternity providers, and fails to address the factors that most influence maternal morbidity and perinatal outcomes.

The authors allude to the fact that closure of rural maternity units may have played a role in the outcomes in their study; however, they downplay this fact and choose to focus on the providers, suggesting that, "the emphasis should remain on monitoring for potentially life-threatening maternal and perinatal complications... ." In our experience, rural maternity care practitioners would not neglect to notice when preeclampsia progressed to eclampsia, for example. With reduced access to maternity care, women in rural Canada will present later, attend less frequent appointments or even choose to avoid transfer for delivery, which results in an increased risk of complications. Further, general health care teams are less prepared than rural teams when women make these choices.

We cannot ignore the need to provide local access to care. Pregnant women in rural areas tend to be younger, have higher rates of smoking or substance use, and have preexisting hypertension. When a pregnancy is labelled high risk, will a woman choose to leave her family, sometimes for weeks before delivery, and travel hundreds (or thousands) of kilometres to receive care? Will she want to deliver where the culture and language may be different, at substantial personal financial cost, and where her support people may not be present?

In areas with primary maternity care (no cesarean delivery), low-volume maternity units or maternity care with family physicians with enhanced surgical skills for cesarean delivery, rural women have outcomes equal to those of their urban counterparts. As rural and urban maternity care providers, we should be advocating strongly for the strengthening of rural maternity services to improve

maternal and neonatal outcomes. It is what rural women want and deserve.

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Reference

1. Lisonkova S, Haslam MD, Dahlgren L, et al. Maternal morbidity and perinatal outcomes among women in rural versus urban areas. *CMAJ* 2016;188:E456-65.

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The authors respond

We thank Grzybowski[1] and Lespérance[2] and their colleagues for their comments on our article[3] and strongly agree that local maternity services have beneficial effects on maternal and fetal/infant health in rural areas. These groups have been longstanding champions for rural maternity care services in Canada, and we applaud their efforts to provide quality care for low-risk women in rural settings.[4]

However, we stand by the results of our study, which showed elevated rates of severe maternal morbidity in women residing in rural versus urban British Columbia. We found that the average adjusted risk for rural women was twofold higher for some severe morbidity. Some rural subgroups and regions may have lower risk than this average, but other regions would have a higher risk.

Geographic barriers are notoriously difficult to quantify. Although travel distance may be a good indicator of access to care, it varies considerably with weather and road conditions as well as type of transportation. Our study used the degree of rural isolation developed by Statistics Canada that has been used to approximate access to health care services.[5,6] We were conservative in our approach and included rural areas with high metropolitan influence (typically considered rural) within the urban category.

Rates of level 2 admission to a neonatal intensive care unit were 3.7% for infants born to women from rural areas and 8.1% for infants born to women in urban areas; rates of level 3 admission were 0.8% and 2.0%, respectively (some infants were admitted to both). This may indicate potential barriers to care in neonatal intensive care units for infants of rural women — a finding that should prompt further study.

We do not agree that our findings undermine the dedicated work of rural maternity care providers in British Columbia, nor would we wish to do so. Rural obstetric care presents challenges that are unlike those encountered in urban settings. Our study found that some morbidity indicators (e.g., transfusion) were not substantially different, which attests to the quality of rural care.

Our study was not designed to determine the factors that influence the risk of adverse outcomes among rural women, and we did not intend to suggest that rural health care providers are responsible. We strongly support the need for further studies and attention to rural obstetric care.

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Hippocrates and Targin

The Oct. 18, 2016, issue of *CMAJ* contained two ads from Purdue Pharma. The first featured a bust of Hippocrates and was headlined "Treating chronic pain, our shared responsibility" and talked about how Purdue was committed to ensuring that the "right medications get to the right patients" (page 1058). The second was an ad for Targin (controlled-release oxycodone/naloxone), a product used to treat chronic pain (page 1070).

Despite Purdue's pledge in the first ad, information in the second ad about "addiction, abuse and misuse" of Targin was buried in the fine print and not in the display portion of the ad. The Targin ad prominently featured the statement, "Demonstrated reduced drug liking relative to oxycodone, when administered intranasally or intravenously." Below this statement, in barely visible print, was the acknowledgement that the "clinical significance of these results has not yet been established." How much reduction in liking was seen was not stated. Intranasal and intravenous administration were likely tested because those are the routes most commonly used by recreational drug users. Targin is only available in an oral formulation, but there was nothing in the ad about the potential of abuse by people who had been legitimately prescribed this dosage form.

Perhaps the bust of Hippocrates in the first ad should have been labelled "Hypocrisy."

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