

Article details: 2019-0165	
Title: Trends in very early discharge from hospital for Ontario midwifery clients from 2003-2017: a cohort study	
Authors: Elizabeth Kathleen Darling RM MSc PhD, Glenda Babe MA PhD(c), Carla Sorbara RM MSc, Richard Perez MSc	
Reviewer 1: Marsha Cohen	
Reviewer comments	Author responses
The authors explain that VED is an important element of the Ontario midwifery model. Eligible women can be discharged within 3-4 hrs of birth. Postpartum care is provided in the home. Previous work has shown that this presents a cost saving with good patient satisfaction. Early discharge may have an impact on cost-effectiveness of midwifery care (but it is not clear what this might be).	Thank-you for this accurate summary. Due to length constraints we have not been able to add a more detailed explanation of how early discharge impacts cost, but basically a shorter length of hospital stay has a lower overall cost to the system, so if less midwifery clients have short stays, the average cost to the system would be higher.
Perhaps readers in the field of obgyn might know the pros and cons of early discharge, but not all readers will know this. Please add one sentence to explain.	Thank-you for this suggestion. Due to length constraints, we have not been able to add this additional detail. In the first paragraph of the introduction we do point to high breastfeeding rates and good satisfaction associated with a model that is based on early discharge.
Also, is any woman eligible for early discharge or only those attended by a midwife?? This needs to be pointed out.	Only midwifery clients have very early discharge. We have stated this in our discussion.
The authors point out that rates of early discharge are affected by external factors such as government policy, or universal bilirubin screening and these may lead to lower rates of early discharge. The authors found anecdotal reports of lower rates of early discharge in recent years. So presumably in order to examine if these reports are true, they conducted a study to look at rates of VED over time. Might be useful at this point to state whether there are other studies (rather than have to wait to the interpretation section).	Thank-you for this suggestion. We have added a phrase at the end of the first paragraph to indicate that there has not been any previous research on this specific topic.

<p>Retrospective population based cohort; all term newborns by SVB born in an Ontario hospital from 2003-2016 who were attended by midwives. The study uses a database from ICES which is the MOMBABY dataset which links inpatient records of women who give birth at Ontario hospital with records of their newborns. If there are any references to state how good these linkages are, please provide them. Also, the authors should state here why 2003 was the start point (we should not have to wait for the interpretation to know this).</p>	<p>There are no published references reporting linkage rates in MOMBABY, but we have added this information to the Supplementary Table about data sources that we have provided based on internal ICES documentation. We have added a line to the methods section to explain the 2003 start point.</p>
<p>Service provider codes were used to determine if a midwife was one of the care providers at the hospital. Records were excluded if time of birth or time of discharge were missing or there was a very long LOS. LOS was calculated using time of birth and time of discharge—a dichotomous variable was created with VED more or less than 6 hours. Why was this time chosen? Is there a clinical or other reason? Other outcomes were pediatric consultation prior to discharge, phototherapy prior to discharge and readmission for jaundice.</p>	<p>Thank-you for these questions regarding how we defined our primary outcome. We have addressed them above in our response to a similar comment from the editors.</p>
<p>The authors also conducted an analysis of rates of discharge after excluding all newborns where birth was (?also) attended by a physician. Rates of VED for midwife attended births were determined across hospitals.</p>	<p>Yes, in these cases there would have been both a midwife and a physician involved in the care at the birth.</p>

<p>The authors compared rates between VED and non VED infants; These included frequency of each outcome, graphed trends over time. Log binomial regression to model the relationship between covariates and outcome and to calc relative risks. None of these analyses are mentioned in the abstract. Missing value were assessed by case analysis for regression models (low rate of missing data). The rates of VED for each hospital for each fiscal year and a comparison of rates across hospitals was performed.</p>	<p>The results section of the abstract has been edited.</p>
<p>The statistical analyses were well done and are appropriate for the study.</p>	<p>Thank-you.</p>
<p>Main outcomes: The authors found a small decrease in early discharge rates over time and a wide variation across hospitals in rates of VED. There was a slight rise in pediatric consultation and other outcomes. Only about 1/3 of births were associated with early discharge. The limitations of the study were mainly well discussed e.g. not having access to clinical records.</p>	<p>Thank-you.</p>
<p>The paper is well written and the methods are well described. The datasets and statistical analyses seem appropriate. The results of wide variation across hospitals is not surprising and the interpretation is supported by the findings.</p>	<p>Thank-you.</p>
<p>The tables and figures are generally well done, but perhaps there could be one fewer.</p>	<p>Thank-you for this suggestion. We have removed Figure 5.</p>
<p>The flow diagram is a little confusing as it starts with all infants in the dataset. It would be better to start the flow diagram with the number of infants from 2003 to fiscal 2017 (why does 2017 data end in February and not in March??).</p>	<p>Figure 1 has been edited to remove the top two boxes and now starts with the number of infants born between 2003-2017. The end date is in Feb not March because we were examining other outcomes that occurred after the birth (e.g., readmission for jaundice, pediatric consultation) and needed those outcomes to also fall within the 2017 fiscal year in order to have access to that data at the time analysis was initiated.</p>

<p>This reviewer's main concern is for whom are the results intended? If the authors are interested in examining rates of VED over time, then all infants should be included, not just those attended by a midwife. This is because there are many factors affecting these rates and midwifery being only one of them; women who are attended by a midwife may be a special subset of all women and not representative of all parturients in Ontario. This severely limits the generalizability of the study results. If the authors are interested in the effects of midwifery on very early discharge, then again, they need to compare births attended by midwives to those where there is no midwife. This might also include some hospitals where there are no midwives in attendance.</p>	<p>We have explained in the discussion that very early discharge is a practice that is limited almost exclusively to those in midwifery care, and is not supported by hospital policies, clinical guidelines, or available services for those not in midwifery care. For all other births, "early" discharge is typically 24 hours. Our interest was to focus on this specific phenomenon within the context of midwifery care to examine how the original intentions of the model align with practice. We believe this is an important issue to examine given the growing portion of Canadians who receive midwifery care and given our general context of concern re: health care costs.</p>
<p>Reviewer 2: M.F. Bakker</p>	
<p>Institution: UMC Utrecht, Julius Center for Health Sciences and Primary Care</p>	
<p>Reviewer comments</p>	<p>Author responses</p>
<p>From the abstract it is not totally clear what the definition of very early discharge is?</p>	<p>Very early discharge is now defined in the background section of the abstract</p>
<p>Why is there such a wide variation between the hospitals?</p>	<p>We have identified a number of different factors that likely contribute to the observed difference in the discussion. There is not space in the abstract to include this level of detail. Our findings suggest a need for further research to explore this question.</p>
<p>From the introduction it doesn't become clear what the 'normal' discharge would be in other western countries. The current content is really specific for Ontario, this makes it difficult to compare with other countries.</p>	<p>We agree that it would be informative to be able to discuss discharge practices in other Western countries to support comparison, but due to length constraints we have not been able to add this detail to the paper.</p>
<p>From the aim it seems to be important to investigate the patterns of early disease and variation in rate between the hospitals. This is not discussed as main point in the abstract.</p>	<p>This is an interesting related question, however, the population that we have selected is a very healthy, low risk population. Rates of early disease that might impact eligibility for very early discharge are low in this population.</p>

<p>What is the reliability of ICES's MOMBABY? Do other people use these dataset as well for research questions?</p>	<p>There are no publications focussed on describing the MOMBABY dataset, but we have referenced another research paper with a description of it. We have added information on data quality in Supplementary Table 1. Yes, many other researchers use this data set and have done so for several years.</p>
<p>From the methods it already becomes evident that there are quite some factors to take into account. The most important one seems to be 'hospital'. There is quite some variation, which should be taken into account in the analyses. Did the authors consider to perform multilevel analyses for this?</p>	<p>Yes, we conducted a multi-level analysis. The explanation of the modelling has been revised to make this more explicit</p>
<p>Why was discharge <6 hours after birth used a cutoff?</p>	<p>We have addressed this question in our response above to a similar question from the editors.</p>
<p>Lots of variation between the hospitals. What can be an explanation for this? This should be investigated in more detail.</p>	<p>We included as many factors to account for the variation between hospitals as we could in our model given the sources of data that we had available. <i>The large amount of variation between hospitals is a key finding of this research and has not previously been described in the literature.</i> We agree that it would be valuable to investigate the reasons for this variation further, but doing so is beyond the scope of this study given the data we have available.</p>
<p>The authors state: 'Although births conducted by a physician may have involved some kind of complication that would influence suitability for early discharge...'. What if the analyses are stratified for this? Or when a sensitivity analysis is performed excluding these births.</p>	<p>Thank-you for this suggestion. We have added this variable to our model based on this suggestion.</p>
<p>From Figure 2 you'll notice a difference in very early discharge. Remarkably, both lines seem to follow exactly the same course. You would expect more differences here?</p>	<p>No, we would not expect to see more differences here. The proportion of midwifery births that are attended by a physician has remained very stable over time so when we remove them from the denominator we would simply expect the rate to just shift higher (as it does) because very few of the physician attended births will be discharged early. Due to space constraints, we have not addressed this issue directly in the manuscript.</p>

<p>Figure 3: is there an explanation for the different trend seen in the lines? (lower two almost stable increase whereas the upper line shows more fluctuations and a really steep increase from 2011-2012 onwards.)</p>	<p>The observed increases are related to an increase in screening for hyperbilirubinemia. Gradual uptake of guidelines recommending hyperbilirubin screening has led to some increased detection which is reflected in the small stable increases in phototherapy prior to discharge and readmission for jaundice. The larger fluctuation in pediatric consultations reflects challenges in the health system experienced by midwives in accessing recommended follow-up screening for newborns after hospital discharge. Midwives can order bilirubin tests on their own authority, but in some settings, pediatric consultation became the only mechanism for midwifery clients to access outpatient bilirubin screening services following discharge from hospital. The gradual drop after 2013 reflects the creation of other mechanisms for accessing outpatient follow-up screening for midwifery clients. We have added this to the discussion.</p>
<p>The authors investigated the effect of the introduction of two policy factors (CPS and QBP) and state there were no significant changes associated. However, looking at Figure 2, there seems to be a (delayed) decrease over time. Did the authors take into account that a delayed effect could have been expected?</p>	<p>We have reworded our statement about this to clarify we did not find an association with the date the policies were published. In previous research we showed that implementation of bilirubin screening occurred very gradually across Ontario hospitals, but unfortunately for this study we did not have data available to model delayed effects accurately (i.e., screening implementation dates by hospital). We tried modelling the policies with one- and two-year time lags, to account for delayed effects, but none of these approaches resulted in significant results. Due to length restrictions we have not described this in the paper.</p>