

Article details: 2015-0006	
Title	Resources and Population Served: A Description of the Ontario Pediatric Diabetes Network
Authors	Rayzel Shulman MD, Fiona A. Miller PhD, Therese A. Stukel PhD, Denis Daneman MBBCh DSc (Med), Astrid Guttmann MDCM MSc
Reviewer 1	Dr. Lars Hemkens
Institution	University Hospital Basel, Basel Institute for Clinical Epidemiology and Biostatistics, Switzerland
General comments (author response in bold)	<p>In their research paper "Resources and Populations Served: A Cross-sectional Descriptive Study of the Ontario Pediatric Diabetes Network", Shulman and colleagues describe the diabetes care structures for children and adolescents in Ontario. They surveyed all 35 pediatric diabetes centers in this Canadian region (with a 100% response rate) and describe the basic characteristics of care structures. In addition, they use administrative health data to estimate the proportion of patients with insulin pump use as measure of technology uptake.</p> <p>This is an purely descriptive article that might serve for further studies as a basic description of the situation in Ontario. It is well written and interesting to read.</p> <p>There are some issues that in my view might merit closer attention:</p> <p>1. Introduction: Definition of secondary and tertiary center: There is a definition of the tertiary center (i.e. a center associated with a "pediatric academic health science center" – does this mean associated with an university hospital?) but none for the secondary center or community-based center. For readers not knowing the Canadian health care structures, it might help to define them too.</p> <p>We clarified these definitions by referring to all non-tertiary centres as "community" and we no longer include the term "secondary". Further we clarified the definition of centre type as follows: "The five tertiary centres are located in the major pediatric academic health science centres in Ontario's major cities (Toronto, Ottawa, London, Hamilton and Kingston) and serve as referral centres from the community-based centres. Community centres are located in communities across Ontario."</p> <p>2. Methods: The methods are overall well described. However, I am not sure about the definition of "large/small" community centers. To my understanding, centers have been defined as "large" when they have more than the median number of T1DM patients (across all community centers or across all 35 centers)? I have not found this threshold stated in the text or tables. I am also not sure about the consequences of if this data-driven categorization. Wouldn't it be more reasonable (also to allow international comparisons) to say a large center is one that has more than X (e.g. 100 or 200) patients?</p> <p>Please see response above to the Editor's comment #3.</p> <p>3. Methods: Please explain the "community size index" – it was not clear to me what this exactly means.</p> <p>We clarified how this was defined in the methods sections as follows: "A community size index, based on 2006 census population data, was assigned to each centre by using the centre's postal code. Centres located in communities with a population <500,000 were considered rural and those with a population ≥500,000 were considered urban."</p> <p>4. Methods: Pump use as reflected via administrative data:</p> <p>a. ICES – please explain to international readers briefly the role of ICES in Canada</p> <p>We added the following description of ICES in the introduction: "ICES is an independent, not-for-profit organization that, through a comprehensive data sharing agreement with the Ontario Ministry of Health and Long Term Care, conducts health services research for the province of Ontario."</p> <p>b. Is application for a pump equal to getting a pump treatment or is it possible that applications are denied? Please clarify. Is there any external validation which might demonstrate that the approach to estimate the pump-user rate is valid?</p> <p>All applications in the ADP database are those that were approved. This was clarified in the methods. A limitation is that we are only able to measure applications for pump use, not actual pump use. In addition, some individuals who applied for pump funding may have been using pump before universal funding was introduced. These points were also added to the limitation</p>

	<p>section.</p> <p>5. Results:</p> <p>a. The finding that the vast majority of patients is followed in a large community center is not too surprising when the definition of “large center” is based on the number of patients and both categories have by definition the same number of centers. This should definitely be reconsidered.</p> <p>The definition of small and large community centres was re-defined as described above in the response to the Editor’s comment #3. (please see above).</p> <p>b. Since the study has no hypothesis, I think p-values or “statistical significance” should not be overrated. They should also not be reported alone. Please clearly describe the statistical comparison the p-values refer to and take the relevance of any differences into account (statistically significant vs. clinically relevant). For example: the “percent pump use” was 44.7%, 38.8% and 39.7%, i.e. somewhere between 39% and 45% across all centers. This could be interpreted as more or less the same without obviously relevant differences – however the reported p was extremely low –what does this mean for the interpretation?</p> <p>We now present the percent pump use by centre type but do not perform and tests of different. We comment on our findings as follows: “Pump use at each centre type appeared similar, however, there was marked variation in the percent pump use between individual centres.”</p> <p>c. Center resources (and Table 2): Please describe the distributions more detailed, i.e. it would be more informative to know the range and the 25th/75th percentiles.</p> <p>We now report the 25th/75th percentiles rather than the IQR.</p> <p>d. Glycemic control: What does “statistically different” and the “7.5–9.5%” range mean here? Please explain. It would be interesting to know more details about the distribution across centers in this regard (as for physician model, 24h support etc).</p> <p>We now report the median (25/75th percentile) by centre type and we do not perform and tests of difference.</p> <p>6. Interpretation: The interpretation is very long - 3 pages for 1 page of results. The comparison to European and US data is very interesting and very important, but it in my view not sufficiently systematic and thus might lead to biased conclusions. It is unclear whether the data used as comparators are subjectively selected or have been systematically collected. For example, the Insulin pump data are compared to Germany and Austria, while the HbA1c data are compared to an “international study” and data from Norway and the UK. I would assume that not all these data are available for comparison with all countries, but if this is the case, it should be reported. However, while a narrative unsystematic comparison might be biased, a systematic comparison might be beyond the scope of this project. Therefore, in my view, the discussion should focus more on the observed results.</p> <p>We have restricted the studies to which we compare our data to those that are population-based or from large diabetes registries. We specify this in the Interpretation section. Although we agree that a narrative unsystematic comparison might be biased and a systematic comparison is beyond the scope of this project, we feel that some comparison to other large population-based and registry studies reduces the potential for bias, and is worthwhile to provide some context to our findings.</p> <p>7. Interpretation: It is also unclear if the international data are from a similar time period (what would be very important e.g. for HbA1c values, given the recent changes in recommendations for target values), please clarify.</p> <p>The international data to which we compared our data were collected around the same time as our data. We included dates when referring to international data.</p> <p>Potential Conflict of Interest: I have informed the Editors that I am together with the senior author of this article, Dr. Astrid Guttmann, in the working committee of the RECORD initiative -- an initiative working on an extension of the STROBE guidelines for routinely collected data. We do not collaborate in other projects or worked closely together so I hope that I can comment on the manuscript without bias or COI.</p>
Reviewer 2	Dr. Shazhan Amed
Institution	University of British Columbia, Pediatrics, BC
General comments (author response in	The objective of this paper is to describe and compare the distribution of patient load, resources, and technology uptake across the various pediatric diabetes education

bold)	<p>centres within an Ontario network. The goal of the paper is to provide context for other studies about centre resources, quality of care and patient outcomes related to insulin pumps. The study design is cross-sectional and descriptive where each center completed a survey with self-reported data on clinical and social resources, care model (i.e. shared care vs. sub-specialist care), mean A1C, patient load, etc. Administrative data was used to quantify the number of kids on insulin pumps at each center based on completed application forms for pump funding.</p> <p>Strengths</p> <ul style="list-style-type: none">• 100% response rate on the survey allows for robust data• This study provides much needed Canadian data on the patient load per diabetes team member (i.e. nurse educator, dietician, and social worker) at each pediatric centre. This data is needed to assess current capacity across the Network and can be used to advocate for more resources if necessary.• The Pediatric Diabetes Ontario Network is unique and this data would help inform other provinces' processes in creating a similar type of network and the resources required. <p>Weaknesses (points for revision)</p> <ol style="list-style-type: none">1. The objective of the paper is to describe distribution of patients across the network, resources available (by patient load) and whether there are differences across centers – all of which are very important metrics of care quality. What is not clear is how 'technology uptake' based on proportion of kids on pumps by center fits with the overall objective of the paper. How does technology uptake relate to quality of care – or does it at all? How does technology uptake relate to diabetes center capacity/resources? The paper would be significantly strengthened if the authors can make this connection in both the introduction as well as the interpretation. We added an explanation in the introduction that "The rate of pump use and its distribution across centres, since the introduction of universal funding has not been described. It is not known whether there are barriers to pump use related to centre resources." This serves as a justification for our rationale for measuring pump use to serve as a context for examining the association between pump use and centre resources.2. The data collected and analyzed is limited to that describing the health system with no patient level data (i.e. demographic, clinical, etc) making it difficult to meaningfully interpret some of the findings. This lack of patient-level data limits the strength of the paper. Can the authors collect some basic patient level data to augment the health system data that has already been collected? [Editor's note: We understand that this may not be possible.] This cannot be done because currently it is only possible to identify those children by centre who are on insulin pumps using health administrative data.3. Data was obtained from self-report surveys (completed by a nurse or dietician within the centre) without standardization of how data were collected (i.e. mean A1C calculation). Was it just the one person who received the survey who completed it or was the survey completed by the entire team? Please see our response to the editor's comment #2.4. This study falls under the realm of health services research however, it is not clear how this study will inform the delivery of health services or the improvement of quality of care. Addressing this would strengthen the paper. We added the following justification to the end of the introduction: A description of percent pump use as a measure of technology uptake "...is needed to conduct concurrent studies about the association between centre resources, quality of care and patient outcomes related to insulin pump use. If variation in centre resources is associated with management and/or outcomes of pump use, then this information can be used to inform the design of interventions aimed at improving the quality of care."5. Enthusiasm for the paper: I have moderate enthusiasm for the paper given the lack of a good story to connect the data related to technology uptake and quality of care. The conclusions state that: "We plan to describe the rate of pump uptake and discontinuation in relation to centre characteristics and resources." Possibly the publication of this data is premature and the authors can produce a much stronger manuscript and tell a more compelling story once this additional data is collected and analyzed. We feel that there is value in the pure description of variation in centre characteristics and resources in a pediatric diabetes network set in a geographically diverse context with a high incidence of T1D. We feel that this is of interest to other jurisdictions who have a pediatric diabetes network or
-------	---

are considering developing a network. We have attempted to tell a better story by adding the following to the introduction: "We also aim to describe percent pump use as a measure of technology uptake to serve as a context for concurrent studies about centre resources, quality of care and patient outcomes related to insulin pumps. This context is needed to conduct concurrent studies about the association between centre resources, quality of care and patient outcomes related to insulin pump use. If variation in centre resources is associated with management and/or outcomes of pump use, then this information can be used to inform the design of interventions aimed at improving the quality of care."

In the Conclusion we return to this goal by connecting our data related to technology uptake and other resources to and quality of care.

6. Overall the paper is fragmented – it would benefit from a unifying story to pull it all together.

Additional Comments

7. Does an application for a pump always lead to the institution of pump therapy? Or do some patients apply and then choose not to move forward with the pump therapy?
Please see our response to reviewer #1's comment 4b.

8. What is the reason for documenting 24 hour support for patients on pump therapy (rather than for all patients with diabetes?). If a centre provided 24 hour care for pump patients only – what would be the rationale/justification for this?

We initially designed our survey to document resources available for patients using pump therapy. We added the following explanation in the discussion section: "Although we report availability of funded 24 hour support for patients using pumps, from clinical experience, centres who provide this service are likely to provide it for all diabetes patient regardless of their insulin regimen."

9. How did each centre compute their average A1C? Was the approach standardized across centres?

Please see our response to the editor's comment #4

10. Results section – "Center Resources" – 'There were no statistically significant differences between case load across centre type but there was a large range across centres within any type' – The latter part of this sentence is difficult to understand – suggest revising.

We deleted this sentence and rather present these results in table format.

11. The conclusions could be better linked to the research question and findings – i.e. are programs across the diabetes network appropriately resourced OR what future research will help to determine whether programs are appropriately resourced?

As you suggested, we re-structured the discussion and conclusion to better link our questions and findings and comment on appropriate resource allocation within the Network.