# LETTER TO THE EDITOR

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### Comment on: Letter to the Editor by Harding and Illes

The authors[1] report having performed a secondary analysis on the data in Honey et al.[2] Based on these data, the authors concluded that there is a specific access problem to deep brain stimulation (DBS) in rural areas of the Atlantic provinces. They were interested how centralization of DBS services may impact people living in rural areas.

This letter echoes some interesting and valuable thoughts that might help to improve an equal access to complex neuromodulation procedures such as DBS or even magnetic resonance-guided focused ultrasound surgery (MRGFUS). Even though I agree it is crucial to address access issues in remote and rural areas, the conclusions of this letter are not necessarily substantiated due to data that are actually missing in the primary data source.

First of all, the primary article does not include the site where the surgery was performed. The method section states "No data were provided on gender, diagnosis, wait time for surgery, implantation hospital or surgeon, electrode target or clinical outcome" as the data were retrieved from the industry and not from the implanting sites.

Furthermore, the authors claim significant access issues but do not provide any information on which statistical test was used to prove significance.

This is in contrast to the original article that had already analyzed the access between rural areas and the entire provincial populations: "Within each province, the percentage of patients receiving DBS who lived in a rural area was calculated and compared with the percentage of all people living in a rural area within that province. There was no significant difference between the percentage of patients receiving DBS from rural areas". The authors of the letter do not explain why their secondary analysis came to a different conclusion.

The graphical analysis shows the data in cases per million, which is difficult when talking about rural communities in the Atlantic provinces, that comprise a population between several 10,000 to a maximum of 300,000 or 400,000. Therefore, small changes in small population lead to large differences when scaling them up to a million. This makes these numbers seem significant, which they are not according to Honey et al.

In this context, it is of interest that there was a specific access problem for the Atlantic provinces during the study period of 2015–2016. This was a period with a longer hiatus of DBS surgeries in Halifax, which is the main DBS center for this largely rural region. The two neurosurgeons performing DBS had moved out of province or out of country, just before and during the study period.

A regular DBS practice in Halifax was restarted by November 2016. In the meantime, surgeries, including the Nova Scotia cases had to be referred to other centers (e.g. in Ontario and Quebec) or had to wait until the program was restarted. This could be an explanation for a certain disparity between the Atlantic and other provinces during the study period.

Since then, we have been establishing a growing network of movement disorder neurologists and neuromodulation nurses throughout New Brunswick, Newfoundland, Prince Edward Island, and Nova Scotia providing bilingual services. Funding caps for the surgeries have been removed for most of the Atlantic provinces. Furthermore, regular remote video DBS rounds with the four Atlantic provinces have been instated. Nonetheless, critical access issues remain comprising access to a neurologist and associated costs.

One of the biggest burdens for patients and their families are travel-related costs and resources (e.g. expensive flights, hotels, and a designated support person). These might be an over-proportional burden in lower income areas, such as rural Atlantic Canada, where patients often need support by their communities through fundraising, and other support programs to allow for travel to and from Halifax. We are trying to minimize costs by coordinating appointments with all designated team members during the same visit and establishing follow-up visits by neurologists and neuromodulation nurses closer to their home.

Despite this, it should not be understated that there are remaining issues in access as they have been described already by the original study. Preparing a complex procedure such as DBS requires intensive work-up, education, and follow-up, for the patients and their families. This creates challenges that cannot be addressed by simply decentralizing DBS services for a multitude of reasons, for example, case load, overhead costs, and fellowship training.[3]

## Conflict of Interest

Dr. Weise reports grants from Medtroic, grants from Boston Scientific, outside the submitted work; and Dr. Weise is a practicing Neurosurgeon in Halifax, Nova Scotia.

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