

# 1 Accessibility to Primary Care Physicians: Comparing 2 Floating Catchments with a Utility-based Approach

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## 5 Abstract

Floating Catchment Area (FCA) methods are a popular choice for modelling accessibility to healthcare services because of their ability to consider both supply and demand. However, FCA methods do not fully consider aspects of travel and choicemaking behaviour as the only behavioural component is the impedance function. FCA approaches also tend to assign population demand to clinics and levels-of-service to population zones in an overlapping manner that has been shown to bias results by inflating/deflating supply and demand. While the adjustments proposed in the recent “Balanced FCA” method can rectify this, it apportions population and levels of service in a fractional manner. In response, this research proposes a utility-based measure of healthcare accessibility based on a multinomial logit (MNL) destination choice model that avoids the multiple-counting issue in FCA methods and considers several additional behavioural aspects that define the appeal of clinics in addition to the travel time required to reach them, including their capacity and level of crowding. Comparisons of the MNL approach with the original and balanced FCA models using data for the City of Hamilton, Canada, suggests that while the accessibility patterns produced by each method are broadly similar, some key differences exist in the calculated accessibilities and their spatial patterns. The MNL model in particular estimates higher accessibilities in suburban and rural areas. Based on these findings, we argue that both the Balanced FCA and MNL approaches offer merit for planning and policy.

6 *Key words:* healthcare accessibility place-based accessibility utility-based  
7 accessibility destination choice model accessibility analysis

## 8 Highlights

- 9 • Develops a multinomial logit based method for healthcare accessibility
- 10 • Compares floating catchment-based with utility-based accessibility
- 11 • Balanced floating catchment method corrects for inflation of supply and  
12 demand
- 13 • Utility-based approach accounts for more aspects of travel behaviour
- 14 • Each method has merit for health planning and policy

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