

**THE FEASIBILITY OF ESTABLISHING A SATELLITE FRACTURE CLINIC WITHIN
PRAIRIE MOUNTAIN HEALTH: A STATISTICAL ANALYSIS**

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INTRODUCTION

“Patient-centered care” has been a phrase long promoted by the Canadian health care system. In essence, patient-centered care requires health care to focus on accommodating patient needs, rather than patients struggling to navigate the health care system.¹ The Canadian Medical Association (CMA) supports patient-centered care in a 2008 policy by stating that “models of collaborative care must be designed to... reduce fragmentation and enhance quality and safety of care”.² If this type of health care delivery can be achieved, patient outcomes are improved and the overall burden on the health care system is decreased.

As Manitoba overhauls its current medical system to replace it with Shared Health Services, the province aims to provide “the right care, in the right place, at the right time,” regardless of where patients may live within Manitoba.³ To do so, Share Health proposes to create “centralized administrative functions that use human, capital and financial resources in the best way possible”.³ In other words, the Manitoba Government is attempting to create a health care system that is patient-centered, but also financially responsible.

At this point in time, Shared Health is slowly being revealed to the public as changes are announced and introduced across Manitoba. In an effort to facilitate this health care transformation, a statistical analysis of patients traveling to the Fracture Clinic located at Brandon Regional Health Centre (BRHC) from within Prairie Mountain Health (PMH) was completed. The goal of this project was to establish whether it would be feasible to set up a satellite fracture clinic within the Rural Health Authority (RHA) to lessen patient travel and improve delivery of orthopedic services.

MATERIALS AND METHODS

Data from 664 patient visits to the BRHC Fracture Clinic was considered in the analysis. All visits occurred in 2017, and all patients were seen by Dr. Lewis Samuels, an Orthopedic Surgeon at BRHC. Of these 664 patients, 26 were removed from the data set because their identified home community was outside of PMH. Of the remaining 638 patients, 316 lived outside of Brandon. Since the goal of this project was to determine whether a satellite clinic would be feasible, patients living in Brandon were not included in further analysis. The number of patients considered was further reduced by only analyzing those living 100 kilometers or more away from Brandon, as this represented a significant distance to travel to access health care. This left a total of 148 patients in the data set.

Basic information regarding the Fracture Clinic visit for each patient was accessed using Clinical Suite. The Health Record Number (HRN) was used as patient identifiers in the study. Information regarding patient age, the reason for the Fracture Clinic visit, the total number and dates of visits, whether treatment was performed and when, and the home community of each patient was recorded. Using Google Maps, the distance from each patient’s home community

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to BRHC was recorded. The total distance traveled for each patient was then calculated using the following equation:

$$\text{Total distance traveled} = (\text{Distance from BRHC}) \times 2 \times (\text{Number of Visits})$$

Once this data was collected it was used to assess where a satellite fracture clinic could be established and the potential benefit of such a clinic. This will be discussed further in the following section.

RESULTS

The greatest proportion of patients having to travel to the BRHC Fracture Clinic were driving between 100 and 150 kilometers one way to access care (i.e. between 200 and 300 kilometers round trip; Figure 1). Very few patients were driving 250 kilometers or more one way to access care (Figure 1).

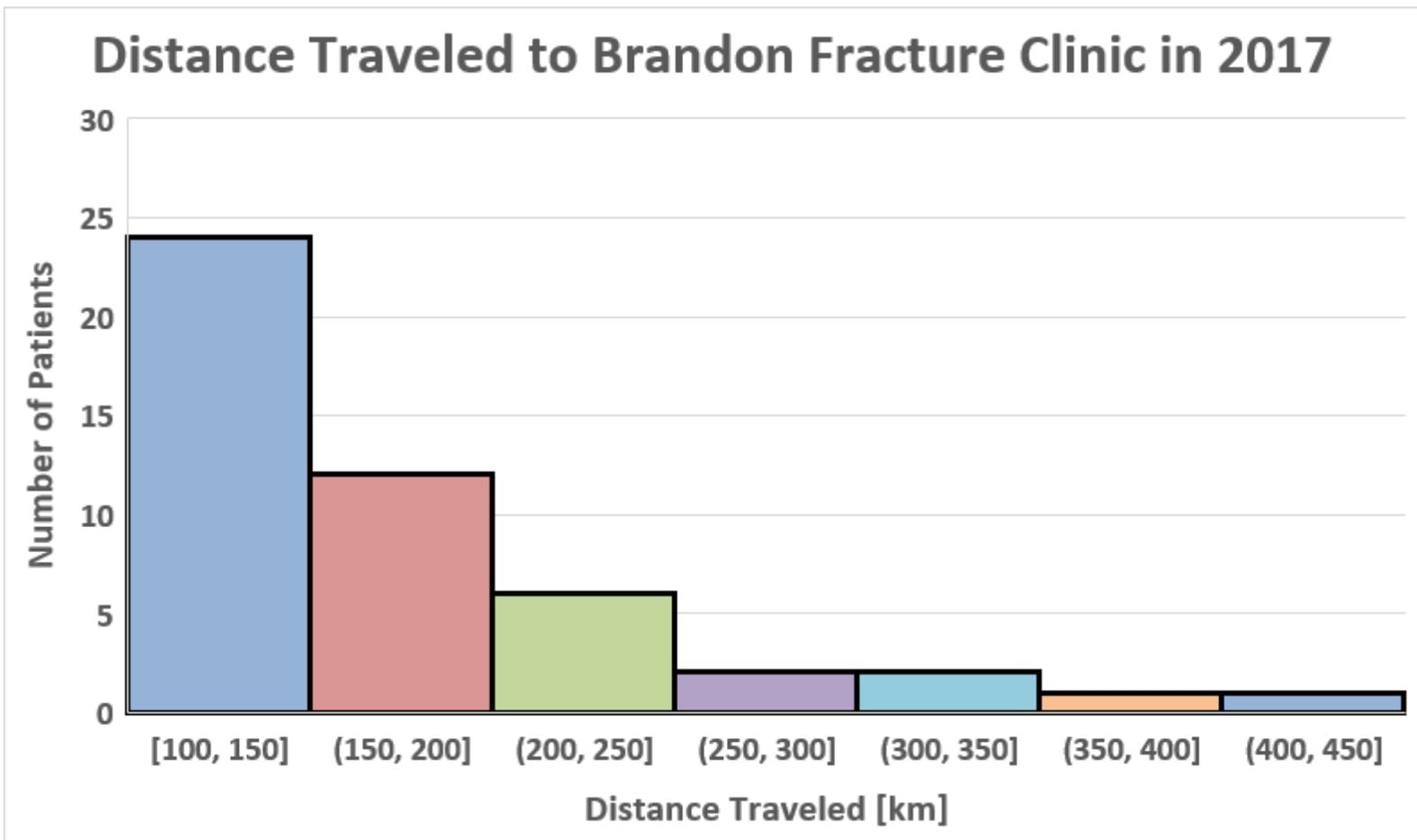


Figure 1: Histogram demonstrating how far patients had to travel to access care at the Fracture Clinic at Brandon Regional Health Centre in 2017. Only those patients traveling more than 100 kilometers were included in analysis.

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To determine the optimal location for setting up a satellite clinic, a map of PMH was generated using Google Maps and markers were placed on the map to represent the proportion of patients coming from each community more than 100 kilometers from BRHC (Figure 2). Each community marker was color coded based on the distance from BRHC, and each marker's size was relative to the number of patients traveling from that location (Figure 2).

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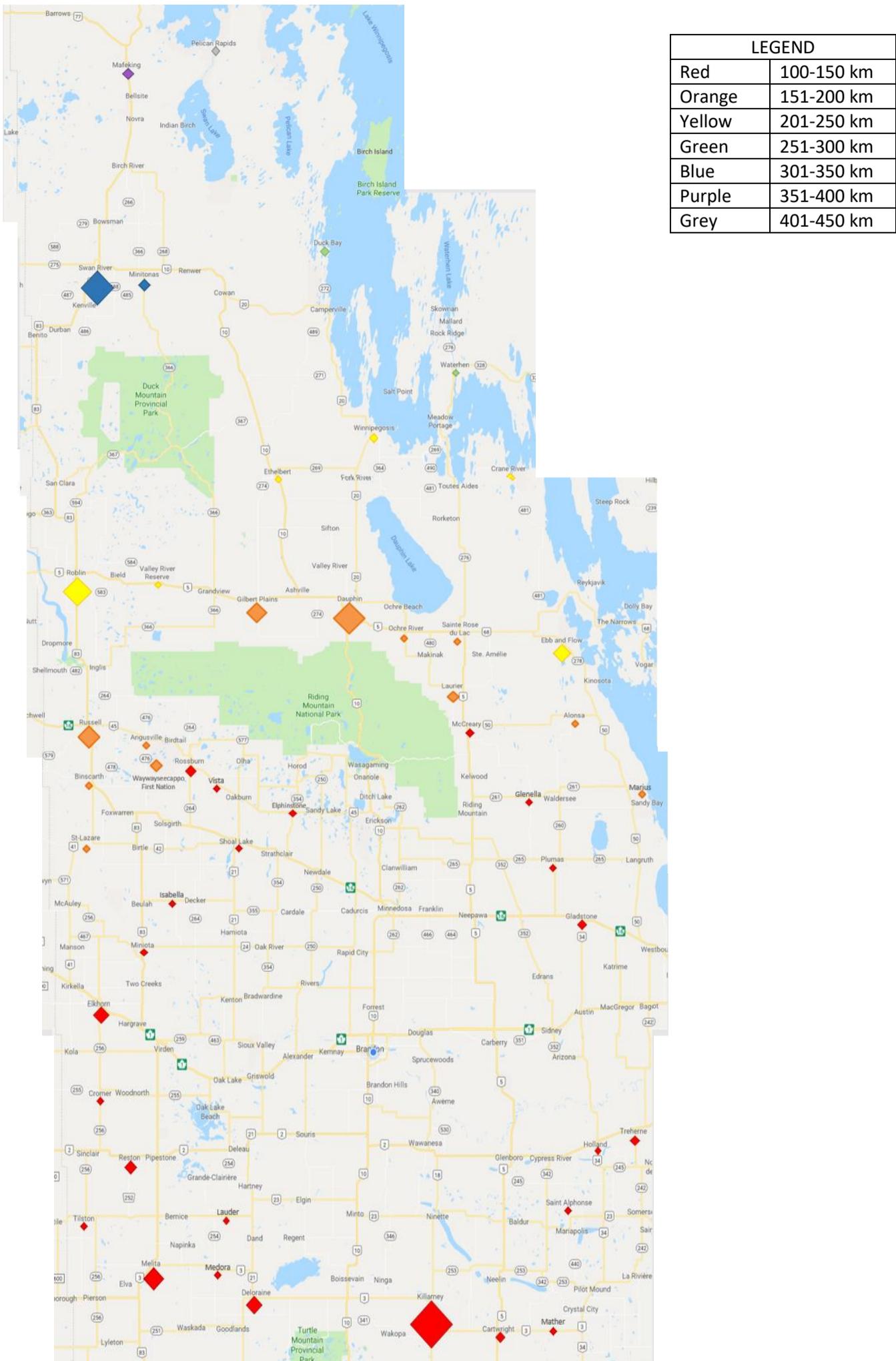


Figure 2: Map of Prairie Mountain Health representing the home communities of patients traveling 100 kilometers or more to access care at the Brandon Regional Lake Health Centre Fracture Clinic in 2017. The color of each diamond represents the number of patients traveling from that location (as described in the legend), and the size represents the relative number of patients traveling from that location in 2017.

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Using Figure 2, Dauphin was identified as a possible location for a satellite fracture clinic. With that hypothesis in mind, the distance driven from each community to Dauphin and to Brandon was calculated and compared. These distances are represented in Figure 3. Communities where there was at least a 50 kilometer reduction in distance traveled by adding a satellite clinic in Dauphin are indicated by green boxes in Figure 3. This idea was further explored by looking at the number of patients that would benefit from an additional clinic in Dauphin (Table 1).

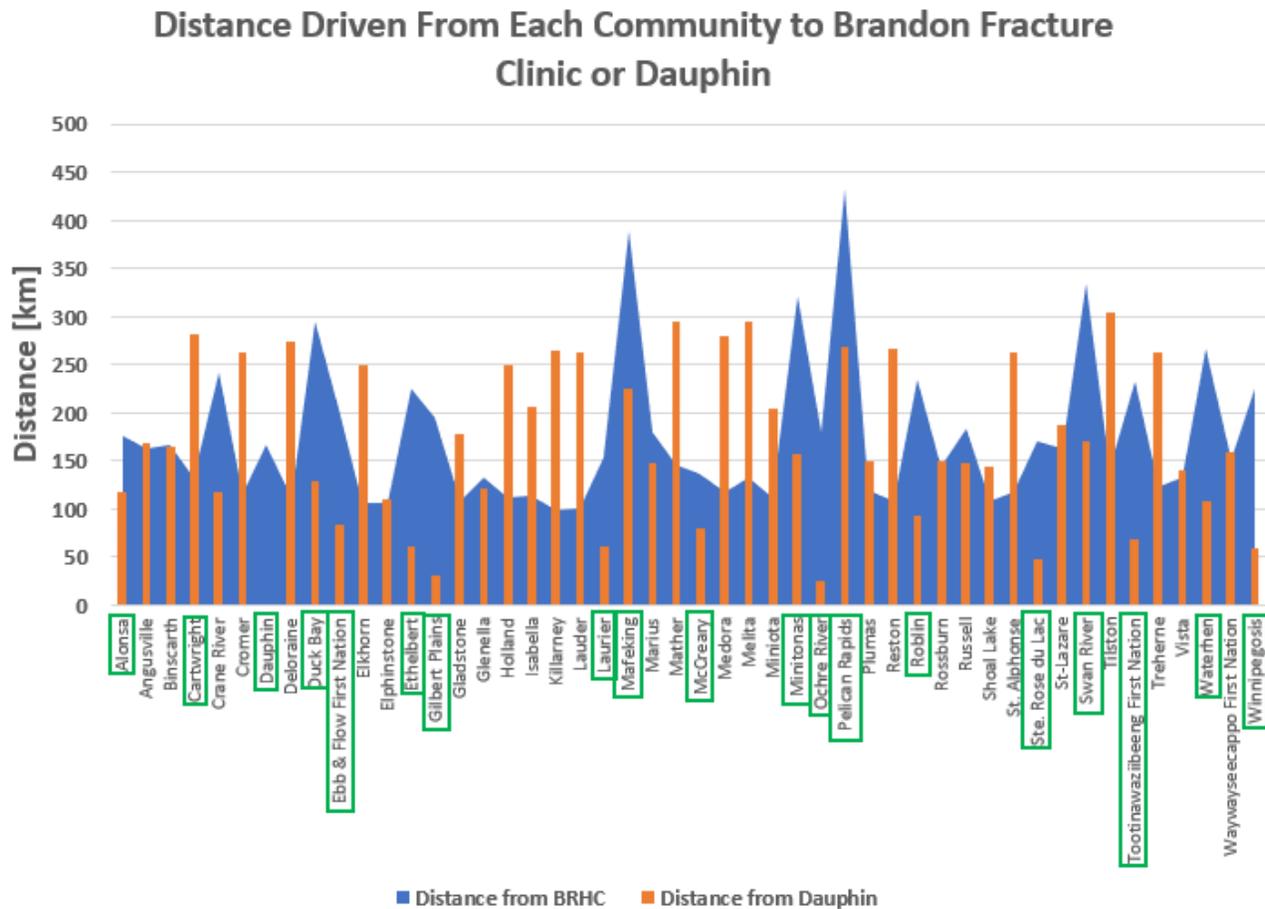


Figure 3: Comparison of the distance traveled from each home community to Brandon and Dauphin. “Home communities” were locations within Manitoba that required patients to travel 100 kilometers or more one way to access orthopedic care at Brandon Regional Health Centre’s Fracture Clinic. If a reduction of at least 50 kilometers was made in travel distance by establishing a satellite fracture clinic in Dauphin, a green box was placed around that community name.

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Table 1: Analysis of the number of patients that would benefit from establishing a satellite fracture clinic in Dauphin, Manitoba. In this report, “benefit” was defined as at least a 50 kilometer reduction in distance traveled from a home community to Dauphin to access orthopedic care. Patients that were defined as “unaffected” did not experience a 50 kilometer reduction in distance traveled by adding another location in Dauphin.

Month	Total Number of Patients	Number of Patients Unaffected	Number of Patients that Benefit	Percent of Patients Who Benefit
January	18	9	9	50.0%
February	24	15	9	37.5%
March	36	21	15	41.7%
April	31	16	15	48.4%
May	27	17	10	37.0%
June	40	21	19	47.5%
July	16	5	11	68.8%
August	32	17	15	46.9%
September	16	5	11	68.8%
October	17	7	10	58.8%
November	18	7	11	61.1%
December	16	10	6	37.5%
AVERAGE				50.3%

The number of patient visits per month was directly correlated with the total distance traveled by patients per month (Figure 4). The months experiencing the greatest number of visits from patients living 100 or more kilometers away were June, March and August (Figure 4). On the other hand, the months with the fewest visits were July, September, October, November, December and January (Figure 4).

Number of Patient Visits Requiring More Than 100 km Travel and Total Distance Traveled to the Brandon Fracture Clinic Per Month in 2017

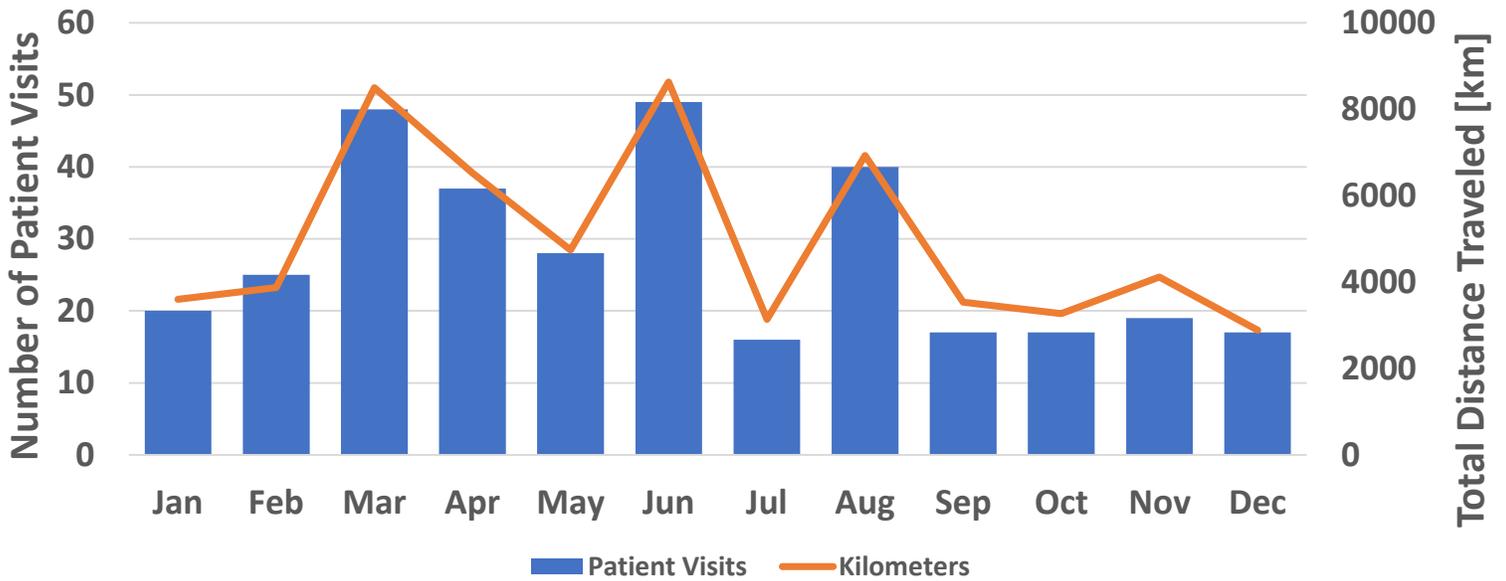


Figure 4: Frequency of patient visits per month (bar chart) and total distance traveled by all patients per month (line graph). Only patients traveling more than 100 kilometers one way are included in the figure.

There was great variability in the age of patients accessing care at BRHC’s Fracture Clinic (Figure 5). The greatest frequency of visits came from the ages 16-26 and 56-66 (Figure 5). The 86-96 year-old age range accounted for the fewest visits (Figure 5).

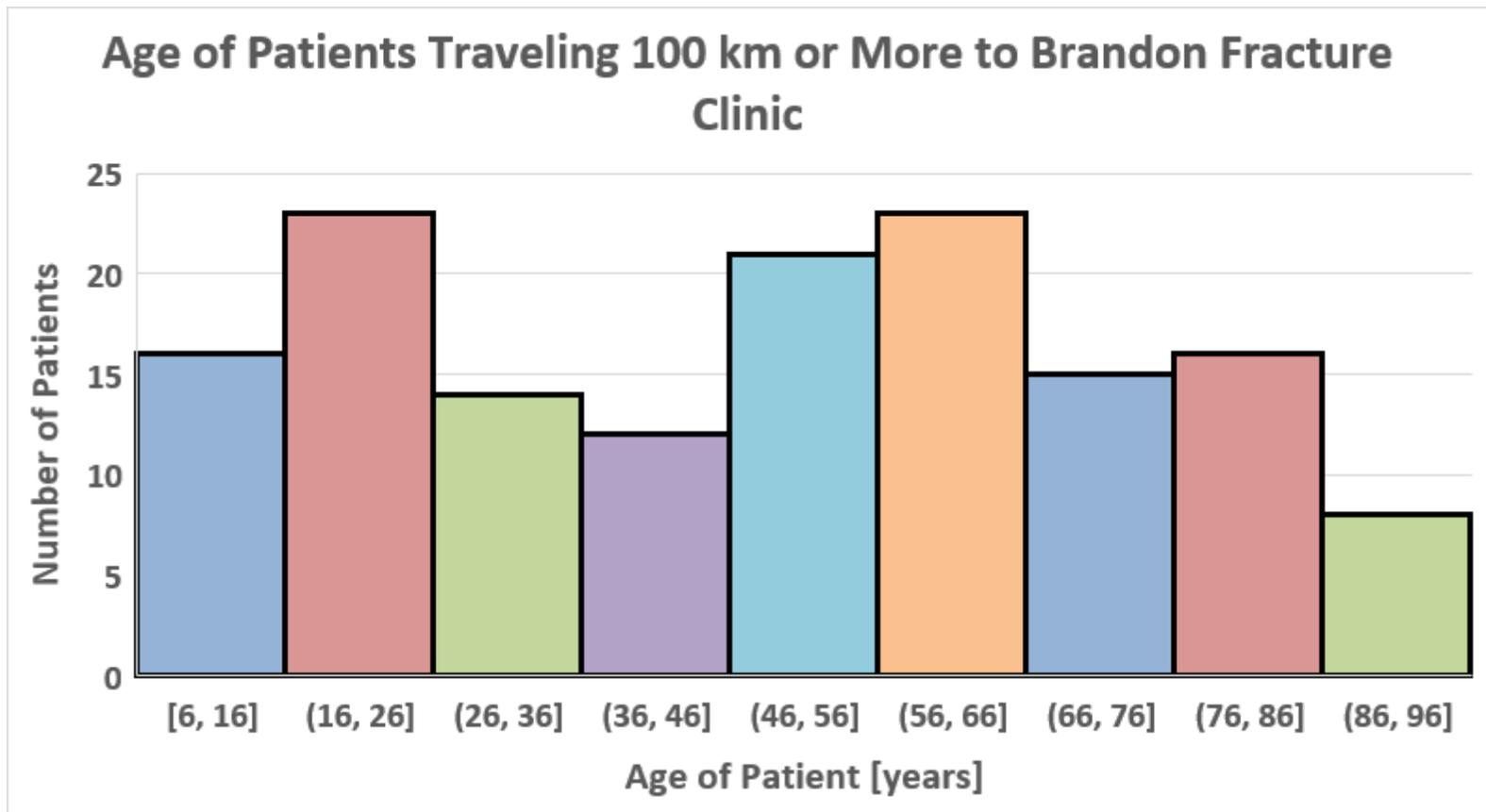


Figure 5: Histogram demonstrating the frequency of visits for patients of different ages. Only patients traveling more than 100 kilometers one way are included.

DISCUSSION

The purpose of this project was to determine whether setting up a satellite fracture clinic in PMH would be a practical method of lessening patient travel and improving orthopedic care. To determine this, patients living 100 kilometers or more from Brandon that accessed orthopedic care at BRHC's Fracture Clinic in 2017 were analysed. Of the 148 patients living 100 kilometers or more from Brandon, most lived in the range of 100 to 150 kilometers away; this accounted for 24 patients in total (Figure 1). The remaining 124 patients in the data set lived more than 150 kilometers from Brandon, strengthening the idea that a satellite clinic would alleviate patient travel (Figure 1). This is further supported by Figure 2, which geographically demonstrates from where patients are traveling to access orthopedic care at BRHC's Fracture Clinic. Analysis of this map would suggest that the best location to set up a satellite clinic within Prairie Mountain Health would be in a northerly part of the region, such as Dauphin. Any clinics set up in the south of the region would not have as significant an impact on patient travel, since these communities are already closer to Brandon.

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Using the hypothetical situation of fracture clinics in both Brandon and Dauphin, the distance driven from each home community to both sites was calculated and compared for patients in 2017 (Figure 3). This analysis revealed that of the 48 communities included, 19 would experience at least a 50 kilometer reduction in distance traveled to access orthopedic care if a satellite clinic existed in Dauphin (Figure 3). In total this would benefit 73 of the 148, or 49.3%, of patients living 100 kilometers or more from Brandon.

Since weather conditions heavily impact the risk of travel to access care, the time of year patients were traveling was also assessed. In this report, the months November through March were considered to be the most dangerous due to winter driving conditions. Figure 4 displays that most patient visits occurred in March, June and August in 2017. While March often presents very challenging road conditions, this is not the case for June and August. It is also important to note that the months with the fewest patient visits requiring 100 kilometers or more of travel occurred in July, September, October, November, December and January (Figure 4). Having significantly less patient travel during the winter months weakens the argument for patient benefit from a satellite fracture clinic. However, it must be considered that patients may be forgoing care during the winter months due to dangerous road conditions, confounding the data set.

When the time of year is considered in conjunction with the hypothetical situation of a satellite clinic in Dauphin, the average percent patient benefit is 50.3% (Table 1). The months where patients would have received the most benefit from a satellite clinic in 2017 were January (50.0%), July (68.8%), September (68.8%), October (58.8%), and November (61.1%; Table 1). Only two of these are considered “dangerous” months due to winter driving conditions, which further weakens the benefit that would be experienced from having a satellite fracture clinic in Dauphin.

Another aspect to consider is the age of patients having to travel to Brandon to access care. In this analysis, there was a bimodal distribution for the frequency of age groups; the most frequent age groups were 16-26 and 56-66 years old (Figure 5). It is presumed that, as patients age, it becomes more difficult for them to access care due to a greater number of co-morbidities, frailty, etc. This decline in function requires someone to drive them to appointments, resulting in days off work causing lost income and productivity. In addition, many elderly people are on fixed incomes, making travel for medical appointments a strain financially. In this sample, 41 patients of the 148, or 27.7%, were above the age of 65 years (Figure 5). Patients below the legal driving limit also need to be transported to and from appointments – this added another 18 patients to the number requiring someone to drive them (Figure 5).

It is important to note that this data set is not complete. For instance, many patients in the data set also made visits to the Fracture Clinic in 2016 and 2018, but these visits were not included in the data set. In addition, several patients had their follow up appointments

scheduled at the Brandon Clinic after their initial assessment by Dr. Samuels at the Fracture Clinic, thereby falsely reducing the number of patient visits captured by this data set.

FUTURE CONSIDERATIONS

At this point in time it appears that establishing a satellite clinic in Dauphin may constitute a patient-centered approach to care. 73 of the 148 patients living 100 kilometers or more away from Brandon would benefit (experience a 50 kilometer or more reduction in distance to access care). According to analysis of the 2017 data set, most of this benefit would be experienced in the months of January, July, September, October, and November (Table 1). Since only two of these months typically present challenging travel conditions, this could be construed as evidence that setting up a satellite clinic in Dauphin is not as worthwhile. However, it is arguable that providing care closer to patients' home communities would alleviate the financial and physical burden involved with commuting to appointments, making for better patient-physician relationships. In addition, providing care closer to patients' home communities may in fact encourage some patients to seek care in circumstances where care would otherwise be inaccessible to them.

Further analysis is needed to concretely determine whether a satellite fracture clinic in Dauphin would meet Shared Health Services' criteria of "[use of] financial resources in the best way possible".³ More information would need to be gathered concerning mode of patient transport (i.e. medical van, personal vehicle, ambulance transferring a patient from a personal care home or hospital), an estimate of costs due to lost productivity when patients travel to appointments and/or require someone to drive them, etc. In addition, it would be helpful to expand the data set and look at data from other years. Finally, accessing data for patients followed up at the Brandon Clinic after initially being seen in the Fracture Clinic would also help to make the data set more robust.

REFERENCES

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