The Impacts of Schedule Changes and Service Suspensions at the Notre Dame Health Centre Emergency Department

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Abstract

In July 2022, the emergency department (ED) at the Notre Dame Health Centre, Manitoba, Canada shifted its schedule from 24 hours every other day to 12 hours 7 days a week. In this paper we evaluate the impacts of scheduling changes on access to ED services. Data was reviewed for 2021-2022 and 2022-2023 fiscal years focusing on Canadian Triage and Acuity Scale (CTAS) scores, monthly patient volumes, and suspension of service notifications. We found that most patients presented during daytime hours with 93% of patients in 2021-2022 and 98% of patients in 2022-2023 presenting between 08:00-23:59. Following ED schedule changes and temporary closure of the Tiger Hills Health Centre ED monthly patient volumes were increased in comparison to the previous year. Between July 11, 2022, and June 30, 2023, 71 days were affected by service suspensions. Full day suspensions were more frequent on weekends while partial suspensions, mean duration of 2.7 hours, were more frequent on weekdays. All but 1 of the 71 affected days was caused by nursing resource shortages. Considering existing trends in when patients seek care, 69% of patients in 2022-2023 presented during the 08:00-15:59 shift which is fully encompassed in the new ED schedule. A total of 27 out of 30 partial closures occurred at the end of day when the least patients typically sought care. We identified nursing shortages to be the main source of ED closures and can serve as a target for improvement in the future. Continued efforts should be made moving forward to ensure that the ED remains open earlier on in the day.

Keywords: ER visits, rural medicine, rural emergency departments, healthcare workforce

Conflict of Interest Statement: Chief of Staff Notre Dame, St. Claude, Swan Lake, Pembina/Manitou

Introduction: Accessing emergency care in rural communities is a challenge faced by many Canadians.[1] The residents of small agricultural communities are more likely to have riskier occupations and to be hospitalised for unintentional injury in comparison to the average Manitoban.[2] This highlights the importance of maintaining small acute care facilities that can provide services to rural populations.[3] While these centres may have a narrow scope of services available, they are still relied upon as an essential service in regions where walk-in clinic same day primary care availability is greatly limited.[1] Previously established best practices have also identified that the triage, stabilisation, and transfer from a local hospital is a safe practice for injured patients requiring higher acuity care.[4] Given the geographical distance that separates rural areas from tertiary care centres in Winnipeg, smaller rural emergency centres are needed to help ensure that timely intermediate level care is available where serious injuries may occur.[3]

The community of Notre Dame de Lourdes, located 120 km southwest of Winnipeg and, has a population of 756.[5] Located in Manitoba's Southern Health Region it serves as a bilingual healthcare hub for the 8,091 residents of the Lorne/Louise/Pembina District.[2] The Centre Albert-Galliot, located in Notre Dame de Lourdes, includes a campus with several facilities, including, a primary care clinic with a variety of allied health professionals and the Notre Dame Foyer, a 60 bed long-term care facility, as well as the Notre Dame Health Centre, a 9 bed hospital with an emergency department (ED), x-ray, and phlebotomy laboratory.[6]

Historically, the ED operated from 08:00-17:00 on weekdays and shared a call schedule with the Tiger Hills Health Centre, located 25 km away in Treherne, to offer expanded coverage.[7] Each site provided 24-hour on call ED coverage beyond their standard schedule (i.e. after 17:00 and on weekends) 50% of the time. In 2021 the Prairie Mountain Health Region's Tiger Hills Health Centre was subject to staffing challenges that led to fre-

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quent closures. In July 2022 the ED at the Tiger Hills Health Centre was closed, ending the shared call schedule, causing the ED at the Notre Dame Health Centre to modify its ED schedule to 08:00-20:00, 7 days/week.[7] Since these changes were implemented, the Notre Dame Health Centre has continued to face staffing shortages that led to periodic ED suspension. The Tiger Hills Health Centre ED re-opened in January 2023 and later restored services from 07:00-18:00 weekdays and every other weekend.[8,9] The aim of this research work is to understand the impacts of these changes in the Notre Dame Health Centre ED schedule on ED access in the community and to help guide local decision-making and planning.

Methods: Summarised data was obtained from the year end reports of Notre Dame Health Centre's statistical repository for 2021-2022 and 2022-2023 fiscal years. This included monthly ED patient volumes, the Canadian Triage and Acuity Scale (CTAS) scores, which triage patients based on acuity, and the time of presentation which were all compared year to year. CTAS scores are defined as level 1 resuscitation: patients who require immediate interventions, level 2 emergent: patients who require rapid interventions, level 3 urgent: patients who could progress to needing immediate interventions, level 4 less urgent: patients who have age related conditions or require reassurance, and level 5 non-urgent: patients with minor conditions that are stable.[10]

Time of presentation data for each fiscal year was broken down into three shifts, 00:00-7:59, 08:00-15:59, and 16:00-23:59 in the original reports. During the 2021-2022 fiscal year the ED would have been open during both the 16:00-23:59 and 00:00 – 7:59 shift when on call. Starting on July 11, 2022, however, the ED would not have been open after 20:00 nor during the 00:00-7:59 shift. The 2022-2023 fiscal year data includes both when the ED was open on the shared call schedule and the current 08:00-20:00 schedule.

The notifications of suspension of services for the site from July 11, 2022, to June 30, 2023, at the Notre Dame Health Centre were reviewed and details related to dates, times, and why closures occurred were compiled. Service suspension notifications were defined as official bulletins released by Southern Health notifying the region of a planned ED closure. Suspensions were defined as ED closures that resulted in the public being unable to access care through the ED during normal scheduled hours of operation. Closures were categorised as full or partial and weekend/holiday or weekday. Partial closures were defined as a closure where ED services were still available during a given day, but not for the entire 08:00-20:00 hours of operation. Full closures were defined as days when ED services were not available. The mean duration of partial closures was also calculated. Partial closures were further categorised as start of day, end of day, or middle of day closures. Start of day closures were defined as closures starting at 08:00 with services resuming before 20:00, end of day closures were defined as starting after 08:00 and lasting until 20:00 when the ED would normally close, and middle of the day closures were defined as closures where services were unavailable for a period of time in the middle of the day but were available at 08:00 and again before 20:00.

The average number of visits per hour the ED was open was computed for July 2022 to March 2023 using the monthly patient volumes and the monthly total hours the centre was open. The percentage of expected hours of operation that were affected by suspensions were also calculated for July 2022 to March 2023. Total expected monthly hours of operation using the 08:00-20:00 daily schedule as well as the total closure hours for each month were used for this calculation.

Results: The data presented in Figure 1, summarizes the ED patient volumes for the two fiscal years, 2021-2022 and 2022-2023. Patient volumes varied between the two years with larger volumes in 2022-2023. Coinciding with the schedule modification beginning in July 2022, and the closure of the Tiger Hills Centre ED there was an increase in patient volume for every month thereafter as compared to the previous fiscal year.

The CTAS scores for the patients presenting to the Notre Dame Health Centre ED for each fiscal year is displayed in Figure 2. A total of 1507 patients sought care in 2021-2022 while 1993 patients presented in 2022-2023. A single patient left without receiving care during the 2021-2022 fiscal year compared to 4 patients during the 2022-2023 fiscal year. Between the two fiscal years the percentage of patients who presented as levels 1 and 5 were similar. There was a lower percentage of patients in acuity levels 2 and 3, and an increase in patients in acuity level 4 in the 2022-2023 fiscal year.

Figure 3 displays when patients sought care. Presenting between 08:00 to 15:59 was the most common followed by 16:00 – 23:59 and 00:00 – 7:59. Daytime presentations (08:00-23:59) were higher at 93% in 2021-2022, and 98% in 2022-2023 when compared to overnight presentations (00:00-7:59), 7% in 2021-2022 and 2% in 2022-2023.

Table 1 summarizes the ED suspensions from July 11, 2022, to June 30, 2023. There were 54 service suspension notifications issued leading to 71 days with suspensions (see Figure **??** for a calendar of suspensions). Lack of minimum nursing resources to safely operate the ED was responsible for 70 out of the 71 total suspensions; one suspension was caused by a lack of x-ray availability. Weekends and holidays were frequently affected and usually resulted in full closure while reduced hours were more common on weekdays (see Table 1). A total of 30 partial closures with a mean duration of 2.7 hours occurred; 27 of these were end of day closures (see Tables 1 and 3). With a mean partial closure duration of 2.7 hours and considering that 27 out of 30 closures occurred at the end day the typical partial closure can be characterised as occurring from approximately 17:00-20:00.

The number of visits per hour ranged from 0.39 to 0.67 and the percentage of hours suspended ranged from 3% to 29% in 2022-2023 (see Table 2).

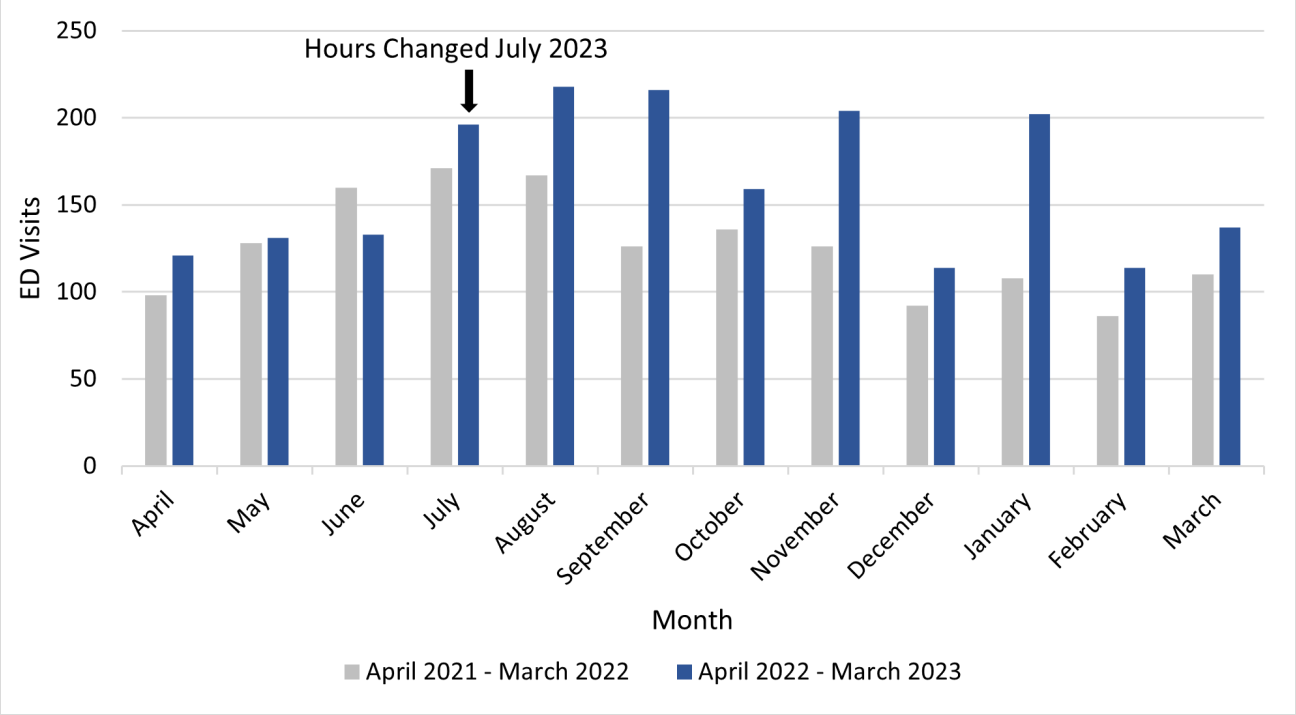

Figure 1. Number of monthly ED patient visits for the Notre Dame Health Centre 2021-2022 and 2022-2023 fiscal years (April 1-March 31).

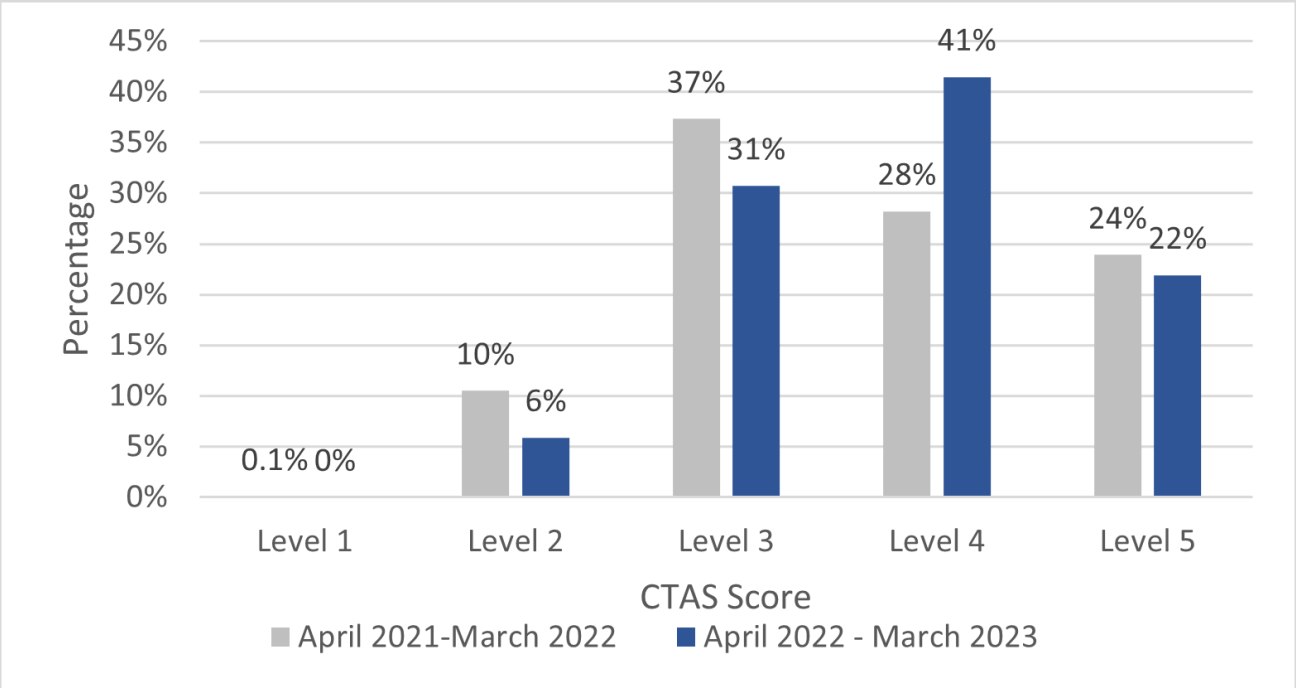

Figure 2. CTAS score percentages for patients presenting at the Notre Dame Health Centre ED between 2021-2022 and 2022-2023 fiscal years (April 1-March31).

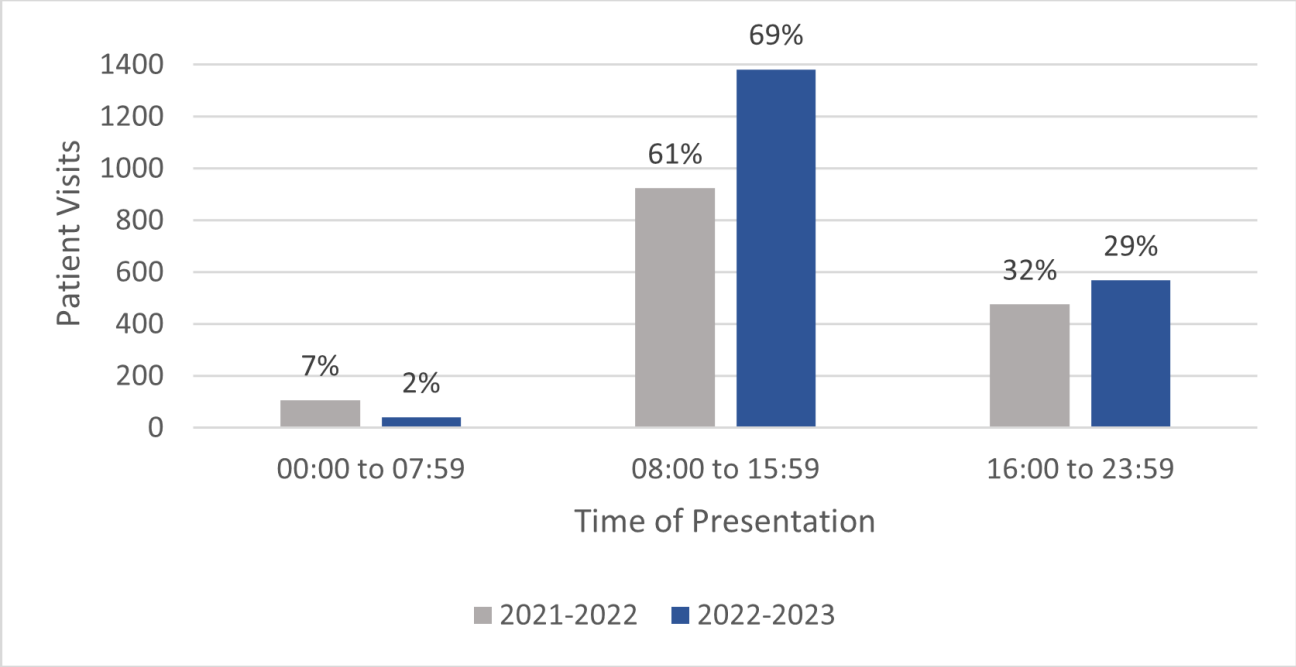

Figure 3. Total patient visits for the 2021-2022 and 2022-2023 fiscal years for each shift. Percentages are also displayed for the time intervals for each fiscal year.

	Total (days affected)	**Full closures (days)**	**Partial closures (days)**	**Mean duration of partial closures (hours)**
Weekend/Holiday	36	27	9	1.6
Weekday	35	14	21	3.8
Total	71	41	30	2.7

Table 1. Summary of service suspension data for the Notre Dame Health Centre ED between July 11, 2022, and June 30, 2023.

Month	**Ratio (visits/hour)**	**Percentage of Hours Suspended**
Jul-22	0.56	5%
Aug-22	0.67	13%
Sep-22	0.63	5%
Oct-22	0.53	19%
Nov-22	0.65	12%
Dec-22	0.43	29%
Jan-23	0.56	3%
Feb-23	0.39	13%
Mar-23	0.39	7%

Table 2. Visits per hour during which the ED was open and percentage of expected hours where services were suspended at the Notre Dame Health Centre ED from July 2022 to March 2023.

Partial Suspensions		
Start of Day	**End of Day**	**Middle of Day**
2	27	1

Table 3. Summary of time course for partial service suspension at the Notre Dame Health Centre ED between July 11, 2022, and June 30, 2023.

Discussion: Despite changes in the Notre Dame Health Center ED schedule and frequent service suspensions due to staffing challenges, overall visit numbers increased during the 2022-2023 fiscal year, suggesting service provision continued and local access to care was maintained. The increase in monthly volumes between the 2021-2022 and 2022-2023 fiscal years is an interesting trend when we consider that the volume increase continued after the Treherne site re-opened in January 2023.[8] This could also be representative of changing healthcare needs as a result of the COVID-19 pandemic.[11] Since in the past the Notre Dame ED shared a call schedule with Treherne the new more consistent schedule and increased volume could suggest that with regular ED hours those seeking care could do so more consistently at the same centre.[7] The initial increase could also suggest that service suspensions at other centres caused an increase in patients now accessing care at the Notre Dame Health Centre.[12] The increase in CTAS 4 presentations may represent a shift in care where acute cases preferentially seek care at regional sites with 24-hour coverage and additional services. Alternatively, a lack of access to ED services after 20:00 may have resulted in a deterioration of their condition leading to a more acute presentation at a regional centre with 24/7 ED services.[3] With limited resources this may reflect more appropriate use of a community ED, like the one in Notre Dame. Our work did not consider access to primary care which likely also plays a role.

Moving forward, looking at region-wide ED volumes so see if the volume trends seen at the Notre Dame Health Centre ED are similar to those at other sites across the region would be beneficial. This could characterise if the changes were seen at all sites or only at the sites where significant schedule changes occurred. The prevalence of seasonal illnesses should also be considered. Region-wide data could also highlight the effects that closing one ED has on neighbouring centres such as the Carman Memorial Hospital ED and the Boundary Trails Health Centre ED. When services are suspended patients must seek care at larger EDs that remain in operation, further increasing the patient load that other sites must address.[3] Other research has demonstrated how closures have a wide-reaching impact and how it is imperative to ensure that some redundancy is available in the system.[3,13]

Since 70 of the 71 suspensions were caused by a shortage of sufficient nursing staff needed to safely operate the ED a clear resource gap has been identified. Since the full day suspensions were more frequent on weekends and holidays solutions that target these temporal trends would likely be beneficial. Recruiting staff to work rurally has been a longstanding challenge however and other solutions should also be considered.[3] Considering visit volumes and prioritizing current staff resources to ensure coverage during busier times or reconsidering sharing staffing resources could be considered to improve patient access to healthcare resources. Literature suggests that developing a local strategy that is tailored to the unique circumstances at the Notre Dame Health Centre would be likely be beneficial.[1]

Partial day suspensions were more likely to occur later in the day when less patients typically presented. The data also suggests that closures that take place from 08:00 to 15:59 are the most disruptive since this is when patients most commonly seek care. Since closures during the 08:00 to 15:59 shift was the least frequent however, disruptions are already being minimized. Focusing on ensuring that service suspensions do not take place earlier on the in the day would help continue this trend. The small number of patients who presented overnight in the 2021-2022 fiscal year also demonstrates that closing the ED from 20:00-08:00 was a reasonable option. Given the finite nursing resources, maintaining the old schedule could have resulted in more schedule inconsistencies since more nursing duty hours would have been required. The schedule modification ultimately prioritised shorter but more consistent hours leading to a more stable schedule. Since full closures were more frequent during weekends and local primary care access was limited on weekends, gathering weekend volume data would play a vital role in further characterising the impacts of suspensions. Considering the role other options like virtual care may have in ensuring consistent access to same day primary care is also warranted.

The CTAS scores compiled demonstrate that more than half of patients had acuity levels of 4 or 5. These concerns can often be addressed in different settings such as in primary care and could suggest a lack of primary care access.[10,14] Thirty-seven percent of presentations in 2022-2023 had CTAS acuity score of 1-3 indicating urgent and emergent care needs for a significant portion of patients.[10] This highlights the need for maintaining access to emergency care in smaller rural communities like Notre Dame de Lourdes. Our data is limited as CTAS scores were not broken down by time. Identifying if trends exist regarding when acuity levels 1-3 patients are more likely to seek care is important to consider in fully assessing the repercussions of modifying ED availability. Ensuring that appropriate care is available when the most acute cases present is important in addressing rural health inequities.

Visits per hour and the percentage of total hours suspended were variable. This reflects the nature of an ED, where it is often difficult to predict patient volumes accurately.[15] Other research has demonstrated that travel time is a major influence in deciding where to seek care and could help explain why patients seek care locally despite an, at times, inconsistent schedule.[16] The monthly variation in the number of closures is also of interest since if these patterns repeat themselves in subsequent years, it could be used to predict times to prioritize for additional staffing. For example, in December 2022, 29% of expected hours were suspended which could suggest additional challenges during the holiday season when staff are more likely to be on vacation. Looking closely at staff schedules and seeing if this trend repeats itself in the future could help confirm this suspicion and assist in guiding targeted

recruitment and retention efforts.

While this study revealed many interesting findings it did have several limitations. This work only focused on the last two fiscal years, with a more detailed focus on the time since the schedule was modified. This is still a relatively new change and looking at the volumes and suspensions from a single year may not be sufficient. This short time frame could be subject to confounding factors that originated from the recent changes such as staff adjusting to these variations, and the community being unfamiliar with the service fluctuations. Continuing to monitor patient volumes and looking at changes to service suspensions in the coming years are still necessary. The data also lacked the granularity needed to determine the exact number of patients who presented outside of the current schedule and did not provide us with information on when the most acute patients, levels 1-3, were most likely to present. Subsequent research with a multi-year focus that addresses the limitations of this work would help further guide the efficient use of limited resources in rural areas.

Modifying the schedule allowed staffing resources to be re-purposed towards keeping the ED open when most patient seek care while ensuring that physician resources were still available for primary care. The previous schedule would have put significant strain on nursing resources and likely would have led to a more unpredictable schedule. Prioritising shorter but more consistent hours resulted in a more stable schedule in the ED. With this comes a better staff experience, more consistent patient care, and the potential for improved care such as through less interfacility transfers.[13] This work shows that despite a significant schedule change and suspensions the provision of care was still frequently available for the local community. Continuing to evaluate service availability and considering changes such as bolstered nursing resources when needed would help further improve health of the region, enhance the care experience, advance health equity, and bridge the inequities between urban and rural populations.[17]

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