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Alberta Stroke Program

DTN in Alberta: Current State of Affairs

Alberta Acute Stroke Day
May 29, 2017
Edmonton, AB

UNIVERSITY OF ALBERTA
FACULTY OF MEDICINE & DENTISTRY
ALBERTA INNOVATES
Alberta Health Services
UNIVERSITY OF CALGARY
CUMMING SCHOOL OF MEDICINE

Disclosures

- None

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Background: Why?

- Deliver tPA such that it is most beneficial

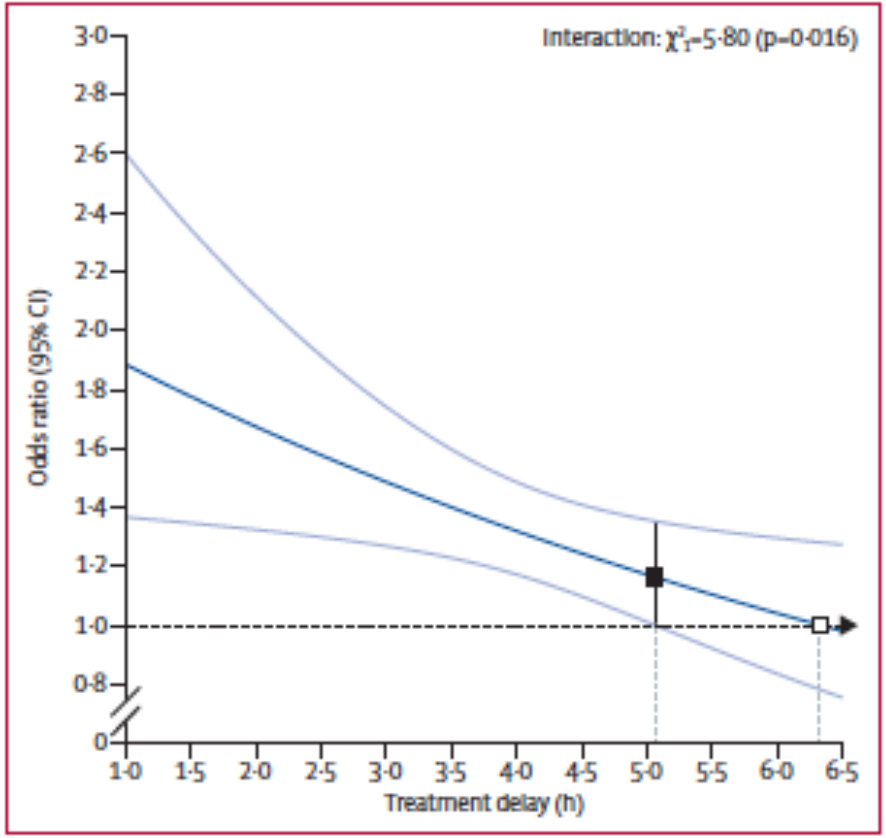

Figure 1: **Effect of timing of alteplase treatment on good stroke outcome (mRS 0–1)**

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Background: National Consensus

COMMENTARY

Good is not Good Enough: The Benchmark Stroke Door-to-Needle Time Should be 30 Minutes

Noreen Kamal, Oscar Benavente, Karl Boyle, Brian Buck, Ken Butcher, Leanne K. Casaubon, Robert Côté, Andrew M Demchuk, Yan Deschaintre, Dar Dowlatshahi, Gordon J Gubitz, Gary Hunter, Tom Jeerakathil, Albert Jin, Eddy Lang, Sylvain Lanthier, Patrice Lindsay, Nancy Newcommon, Jennifer Mandzia, Colleen M. Norris, Wes Oczkowski, Céline Odier, Stephen Phillips, Alexandre Y Poppe, Gustavo Saposnik, Daniel Selchen, Ashfaq Shuaib, Frank Silver, Eric E Smith, Grant Stotts, Michael Suddes, Richard H. Swartz, Philip Teal, Tim Watson, Michael D. Hill

doi:10.1017/cjn.2014.41

Can J Neurol Sci. 2014; 41: 694-696

The importance of treating ischemic stroke patients quickly has long been recognized, and the mantra "Time is brain", is now ubiquitous.[1,2] Unfortunately, the thinking "We still have time in the treatment window…" is occurring too often during the acute stroke code. The treatment window from time of onset is 4.5 hours[3] in most guidelines,[4,5] yet there is declining benefit as time elapses. A 1997 National Institute of Neurological Disorders and Stroke (NINDS) Symposium and the subsequent Brain Attack Coalition[6] set the standard of 60 minute door-to-needle time.[7] This door-to-needle time was arbitrary but designed to provide a useful metric. It has now been incorporated into both national guidelines and accreditation standards[8–10] but has been treated more like a guide or a range rather than a hard target. Parkinson's law - "The job expands to fit the time available" - is as true in stroke care as it is in economics.[11] We argue that to change this progression and individual patients may vary substantially, the damage is staggering. Acute ischemic stroke is a medical emergency that is as, or more, time sensitive than myocardial infarction[14] and trauma.[15] We need to treat it as such. Using conservative calculations of 800 000 strokes per year in North America, where 40 000 are treated with intravenous tissue plasminogen activator (tPA), and 16 000 (40%) of these have a good outcome, an additional 3 000 patients will have good outcomes based on a decrease of 30 minutes in time to treatment.[16] In addition, this calculation does not allow for a projected increase in the number of patients treated. The optimal door-to-needle time is the fastest possible time that preserves safety and appropriateness.

When hospitals and stroke teams use a systematic quality improvement approach to stroke thrombolysis, significantly lower door-to-needle times can be realized. In Helsinki, an initial

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Goals and Objective

- Median Door-to-Needle time = 30 min
- Percent treated within 60 min = 90%
- Across all of Alberta
- First jurisdiction to achieve this across an entire population

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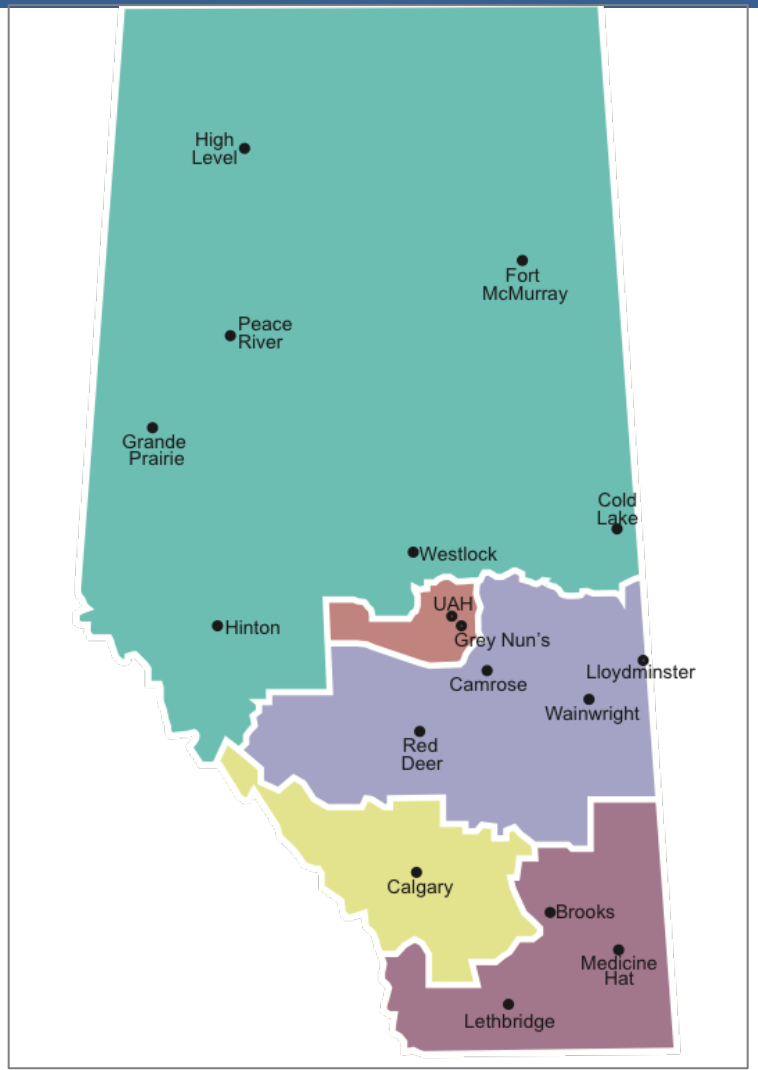
Our Stroke Centres



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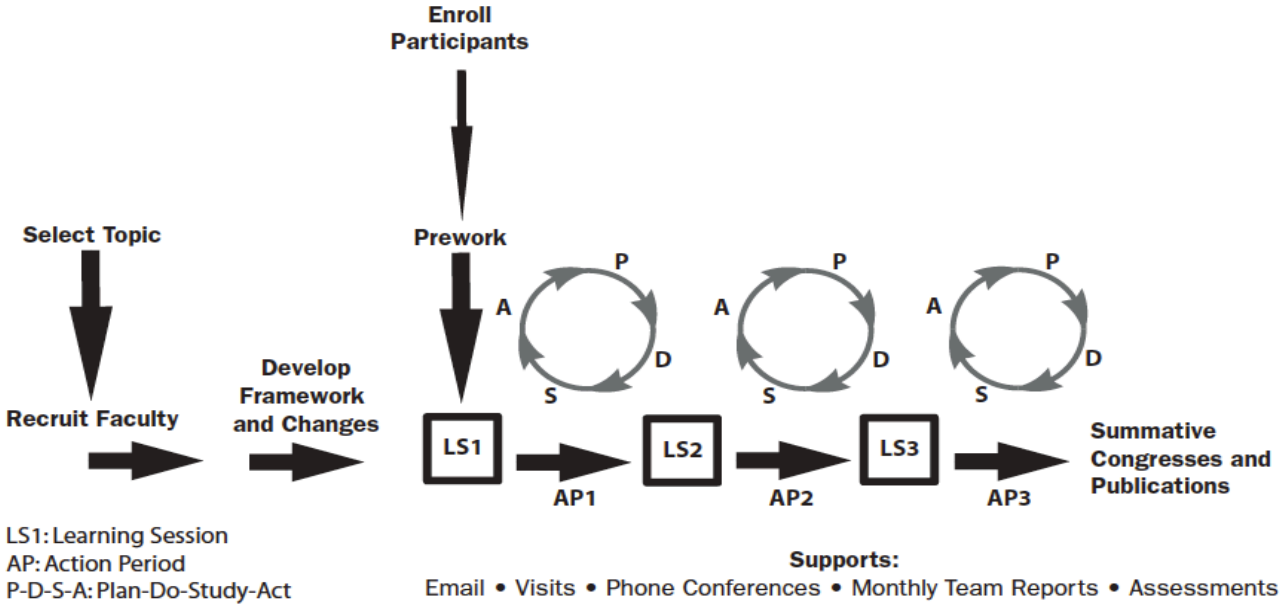
Methodology: IHI's Improvement/Innovation Collaborative Model

- Allows for improvement to occur across many hospitals -> **for QuICR through the entire AHS health system**



QuICR's DTN Improvement Collaborative

Sep 29 2015 Calgary | Nov 24 2015 Edmonton | Mar 8 2016 Calgary | Sep 23 2016 Edmonton

- Participation from 17 hospitals (all PSCs and CSCs)
- Each site had teams made up of representatives from
  - ED physicians, ED nurses, Radiologists, EMS, DI technicians, Administrators
- Over 225 participants from these sites, EMS, RAAPID, Cardiovascular Health & Stroke SCN
- Site Visits conducted to all 17 Stroke Centres
- Webinars during Action Periods
- Data Collection and Feedback
- Process Mapping

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Changes for Improvement

1. Pre-notification by EMS of a possible Acute Stroke Patient that may be eligible for treatment
2. EMS placing IV lines enroute to the hospital
3. Swarm the patient upon arrival to obtain patient history and assess for stability
4. Rapid registration, pre-registration, or registration as *unknown* (based on local context)
5. Not waiting for lab work unless otherwise indicated by patient history
6. Moving patient direct to CT scanner on EMS stretcher
7. Rapid imaging (CT & mCTA) protocol
8. Rapid process for telestroke consult: heads-up call, active connection
9. Administering tPA in the scanner

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Results Table

Hospital Type	PRE (Jan 2009-Dec 2014)		POST (Mar 2016-Feb 2017)		p
	Number	Median DNT (IQR) min	Number	Median DNT (IQR) min	
All	1,846	68 (49-93)	476	36 (26-54)	<0.0001
Urban-tertiary (n=2)	1,221	63 (45-87)	263	32 (24-45)	<0.0001
Community with 24/7 neurology (n=2)	308	73 (53-102)	91	32 (24-43)	<0.0001
Community with limited or no neurology (n=4)	210	85 (69-120)	64	62 (40-81)	<0.0001
Rural (n=9)	107	74 (62-93)	58	53 (39-78)	0.0002

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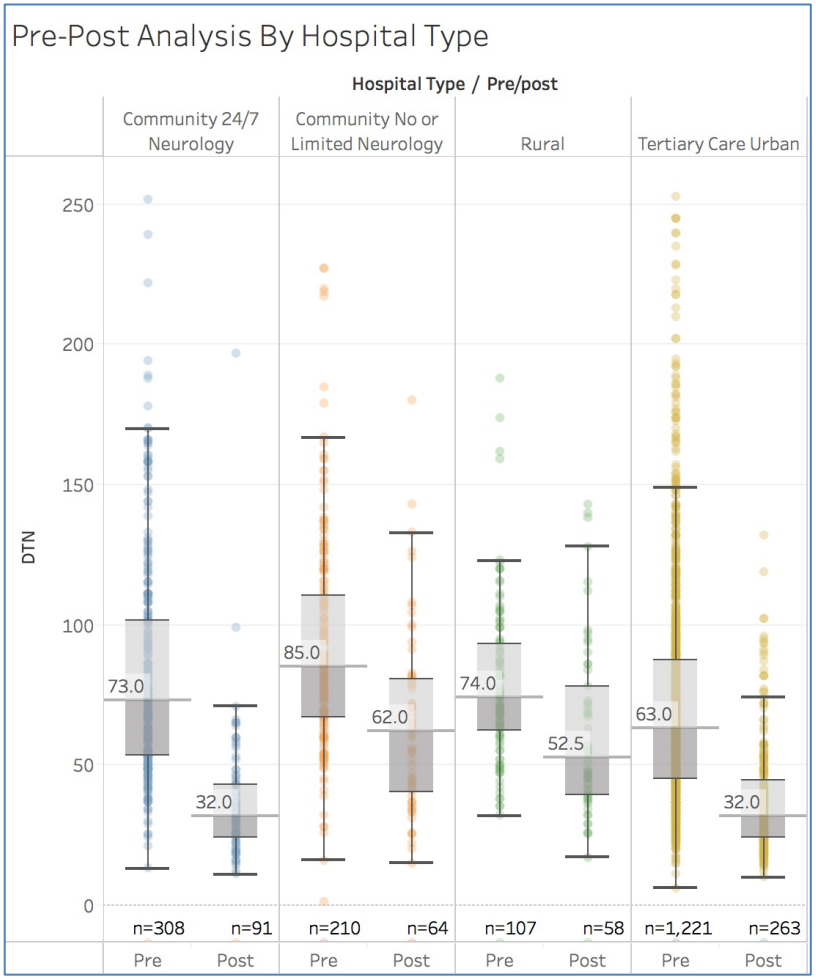
Results Figure



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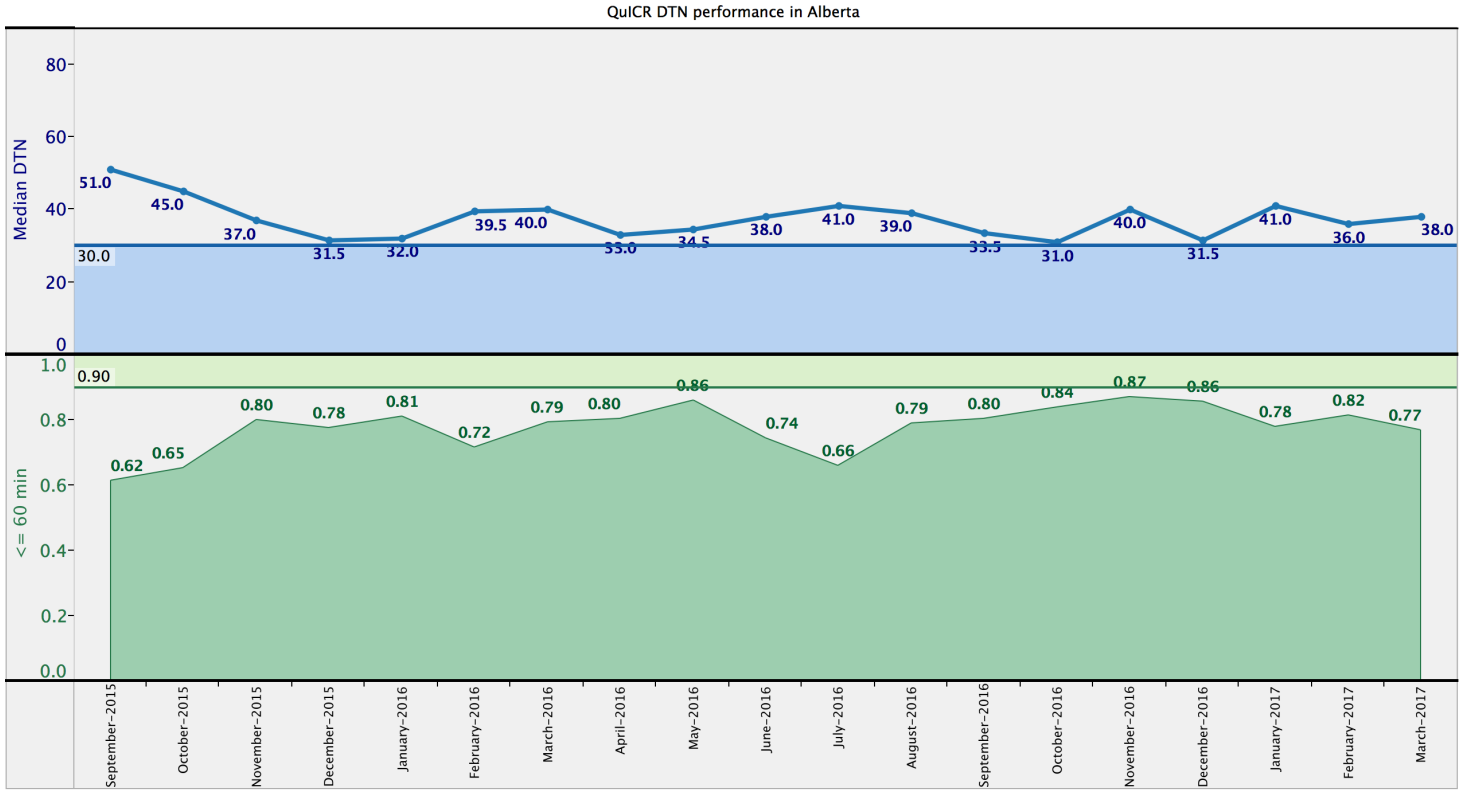
DTN Trend (monthly)



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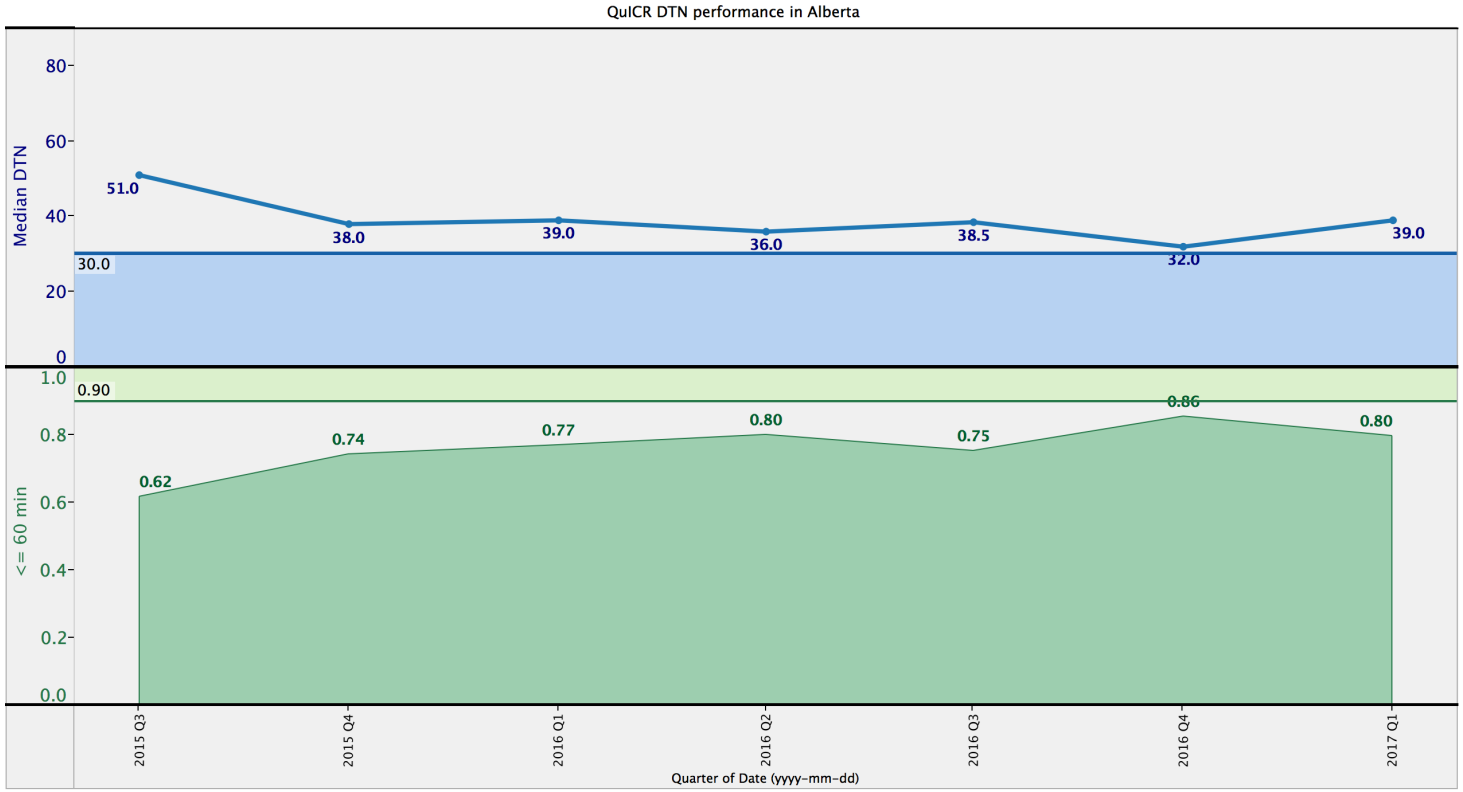
DTN Trend (quarterly)



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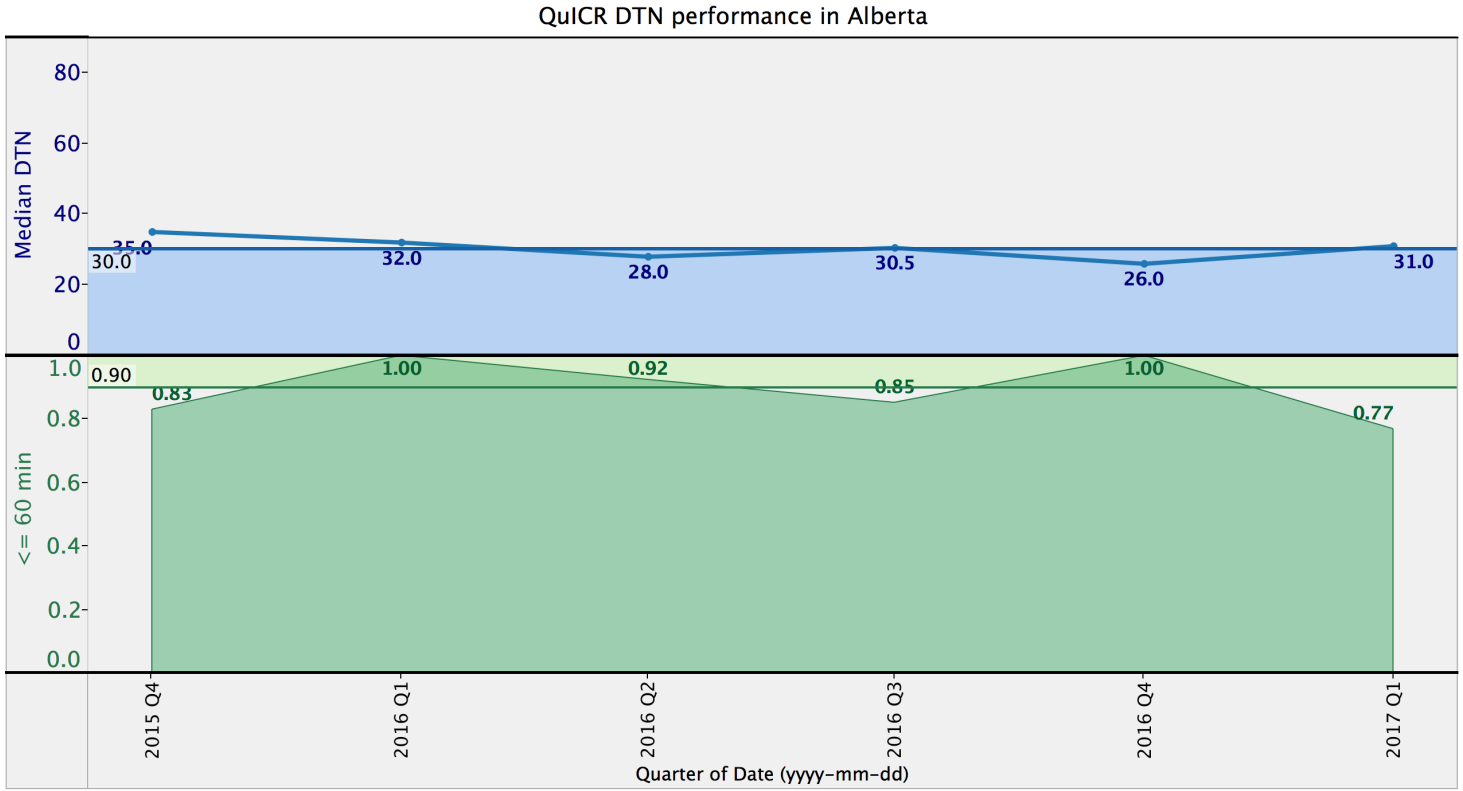
DTN Trend - Calgary



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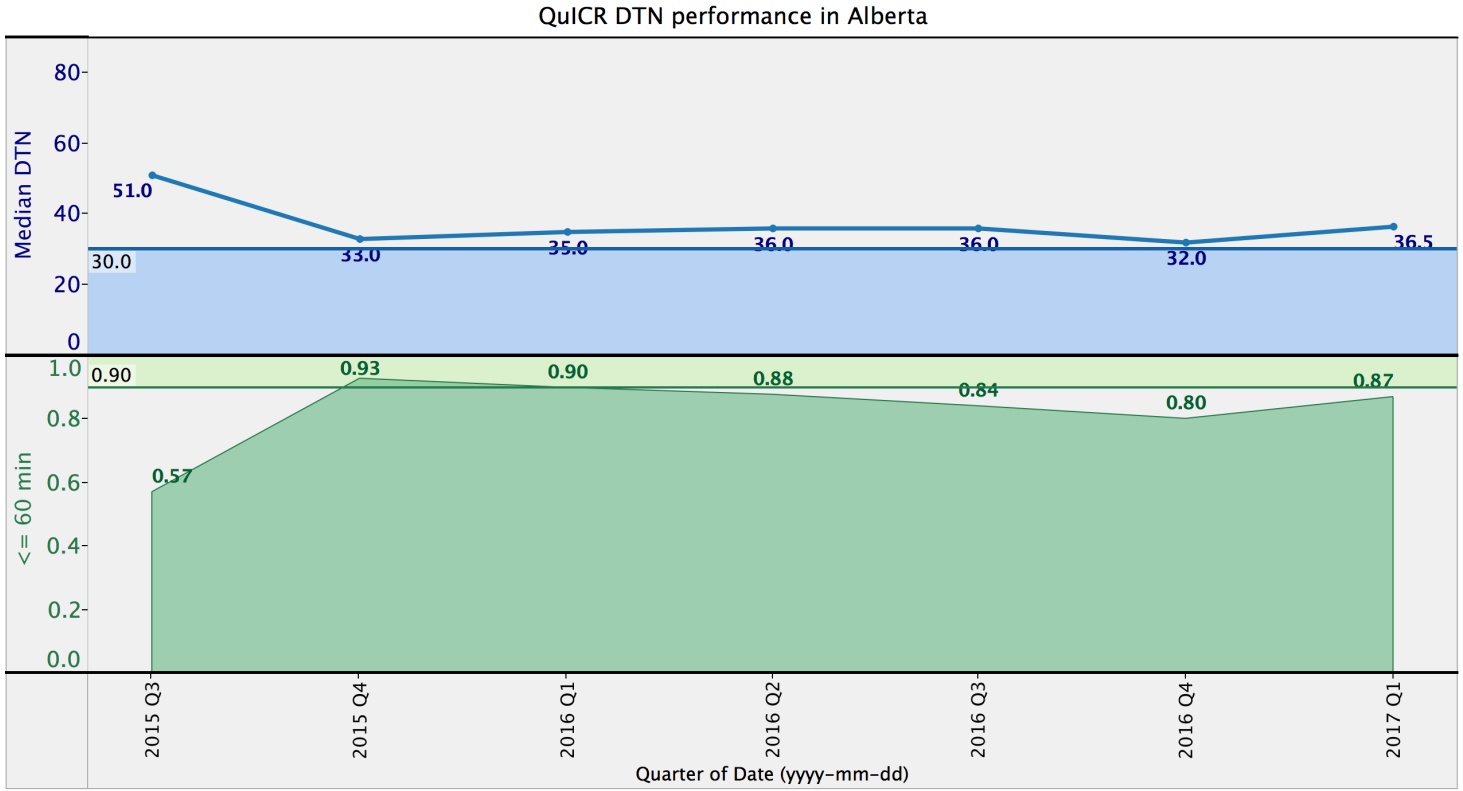
DTN Trend - Edmonton



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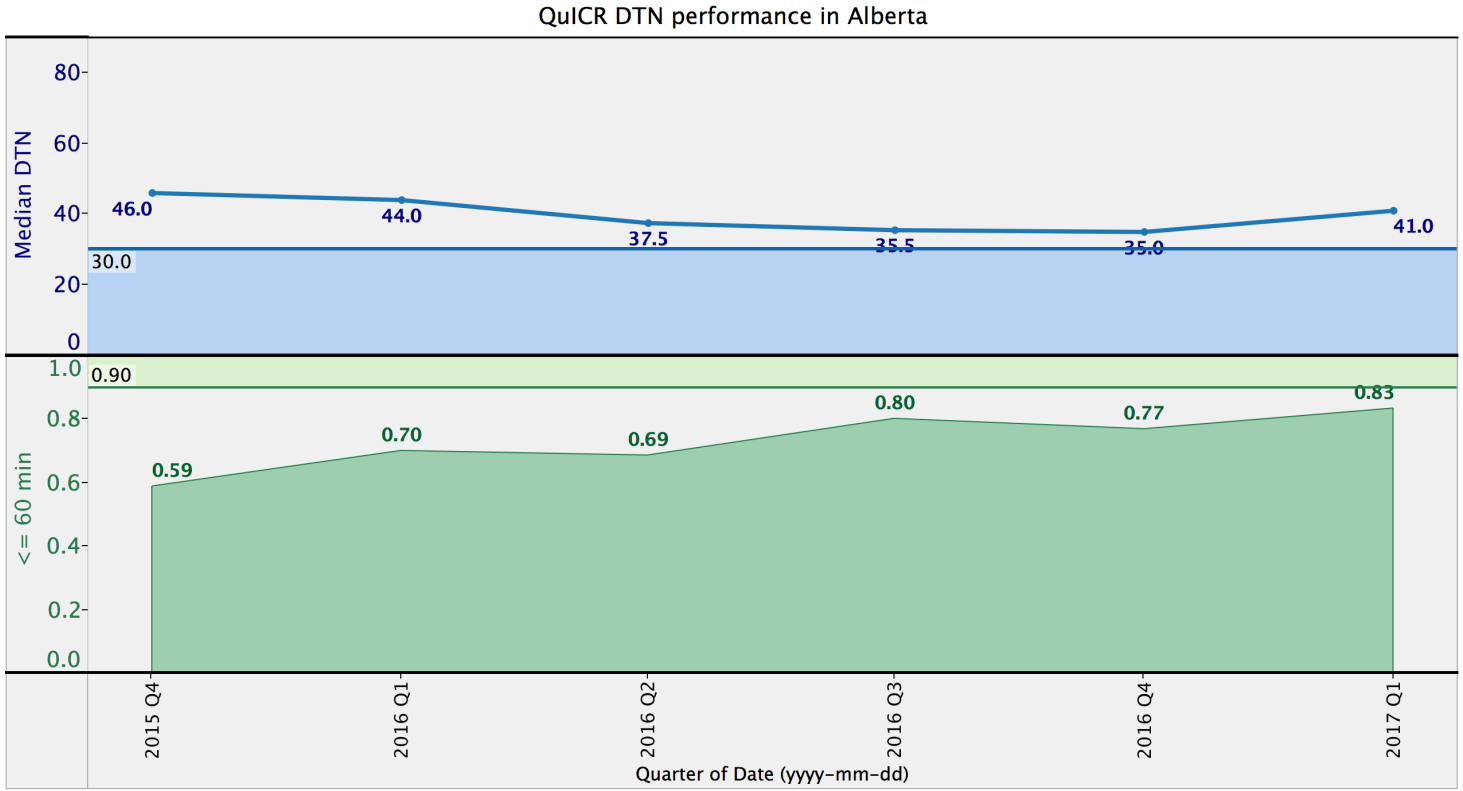
DTN Trend - Central



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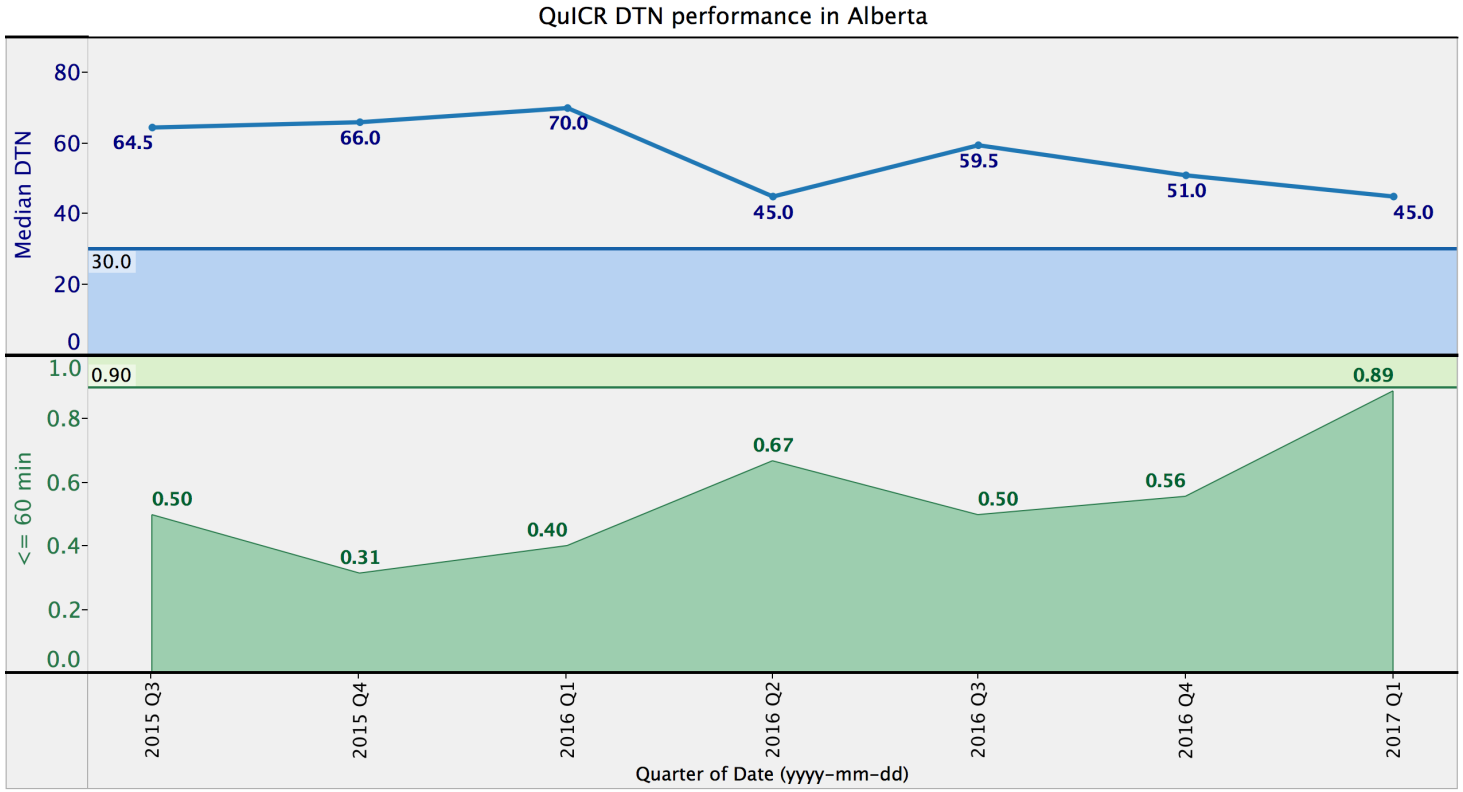
DTN Trend - North



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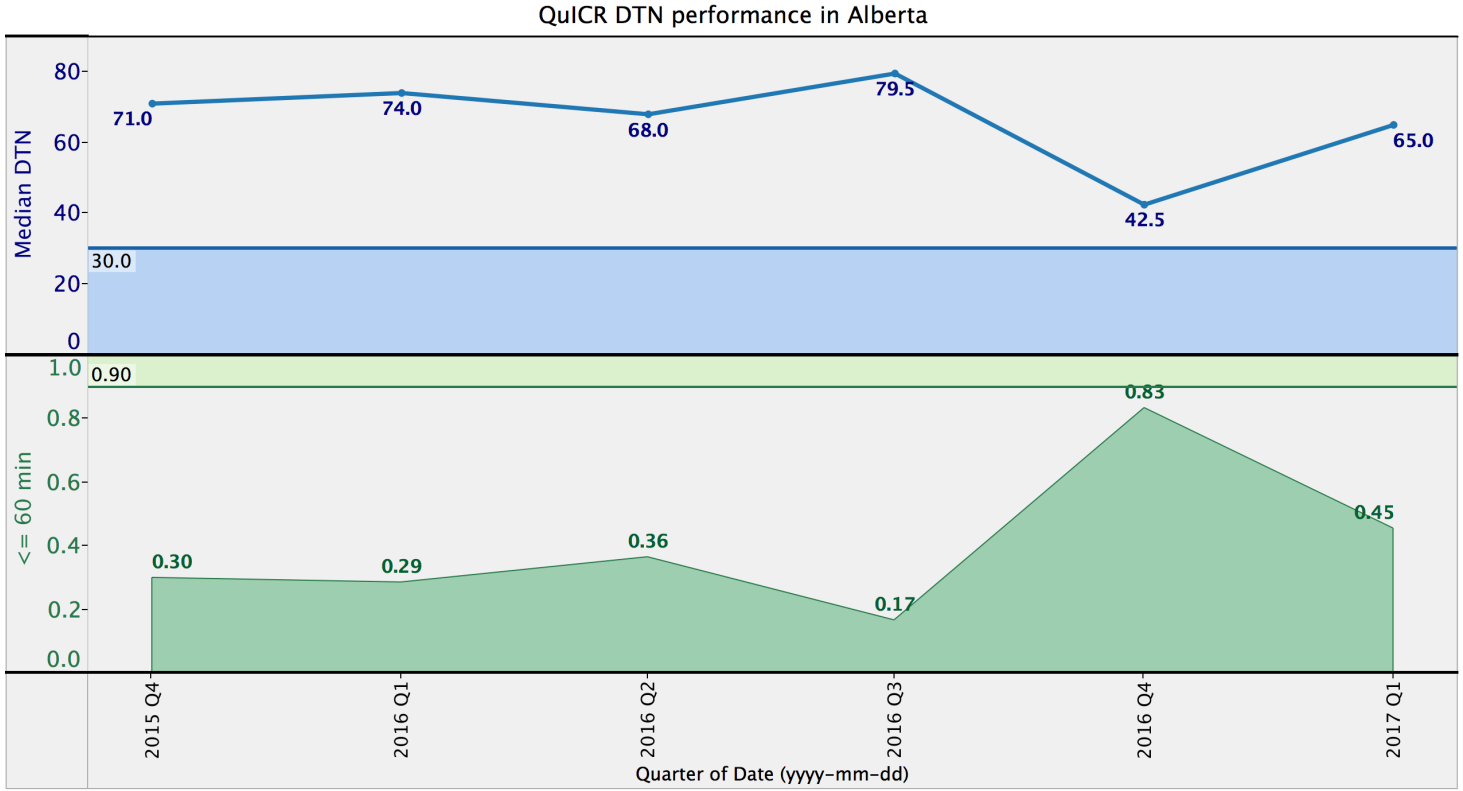
DTN Trend - South



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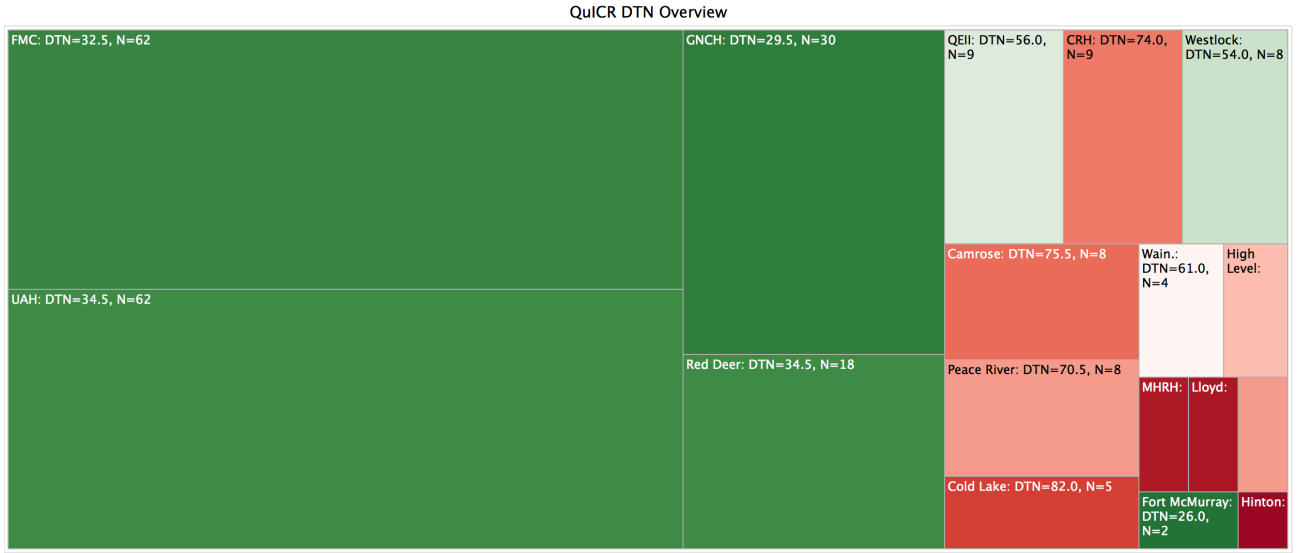
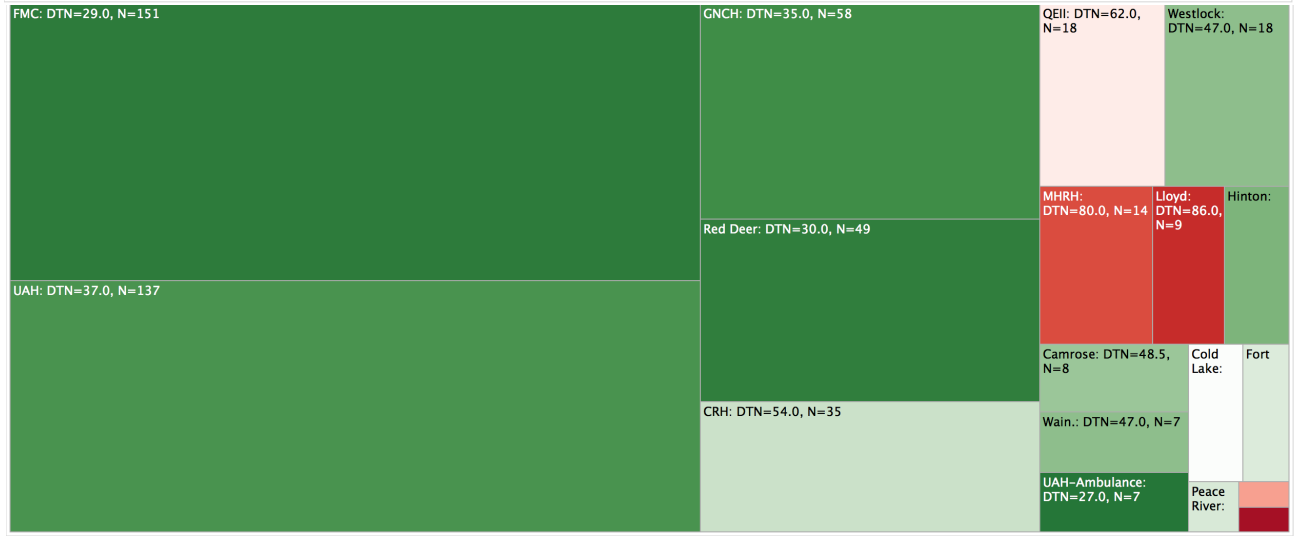
Alberta Heat Map

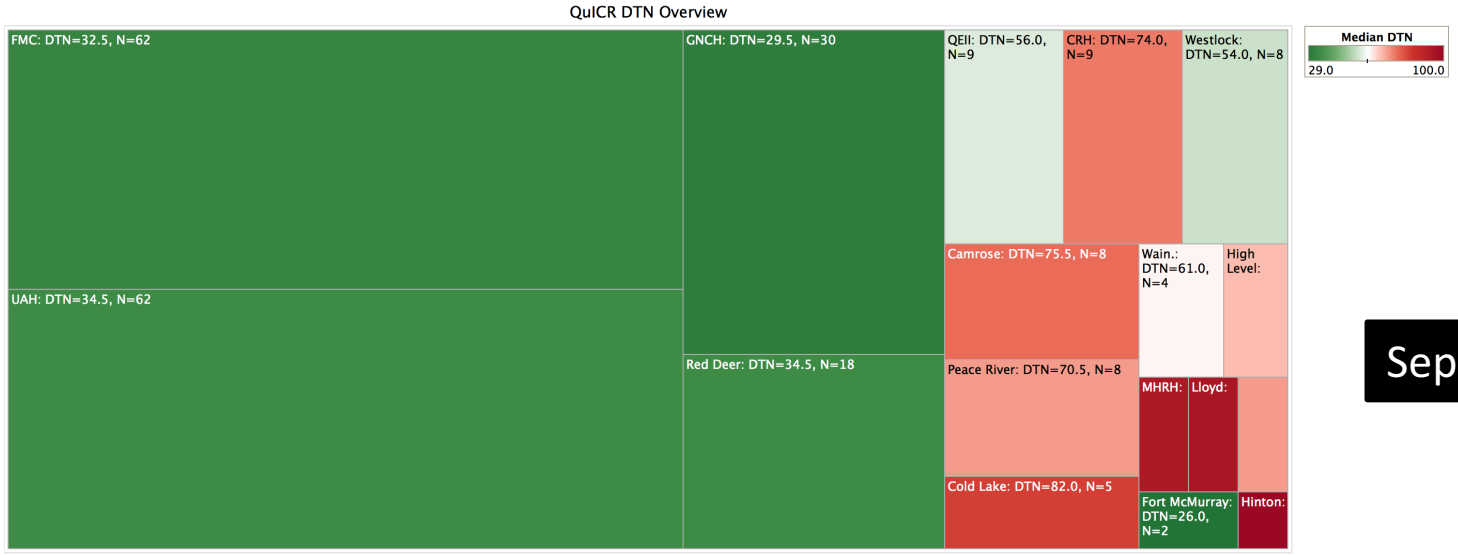


Sep 2015 – Feb 2016

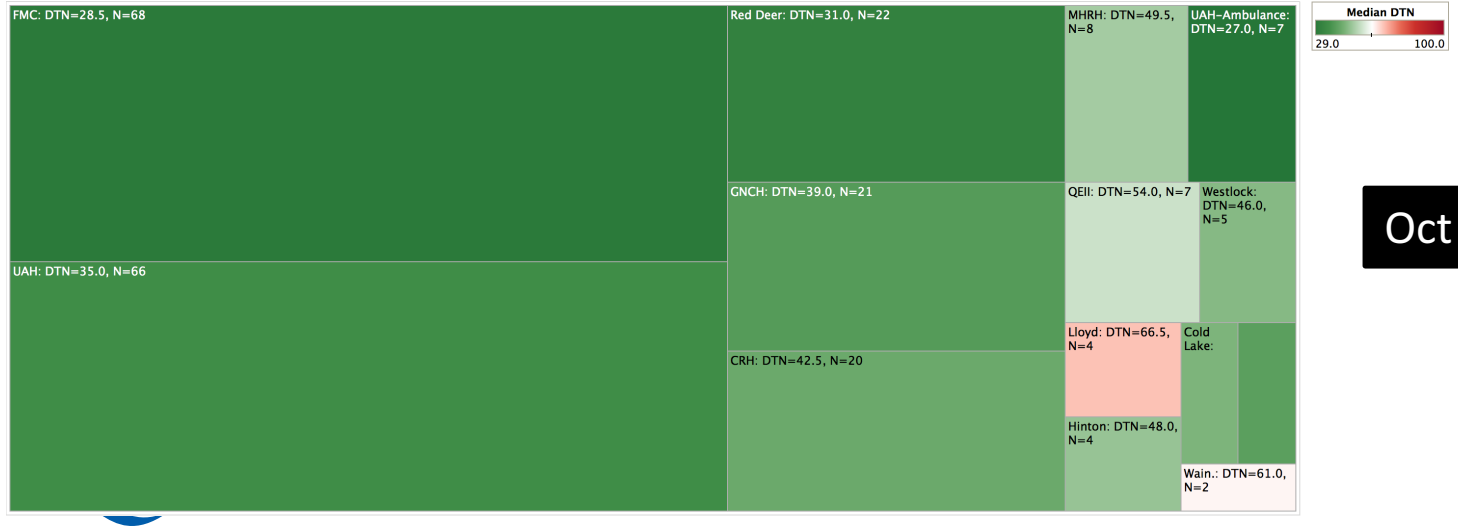


Mar 2016 – Mar 2017

Alberta Heat Map (after Collaborative)

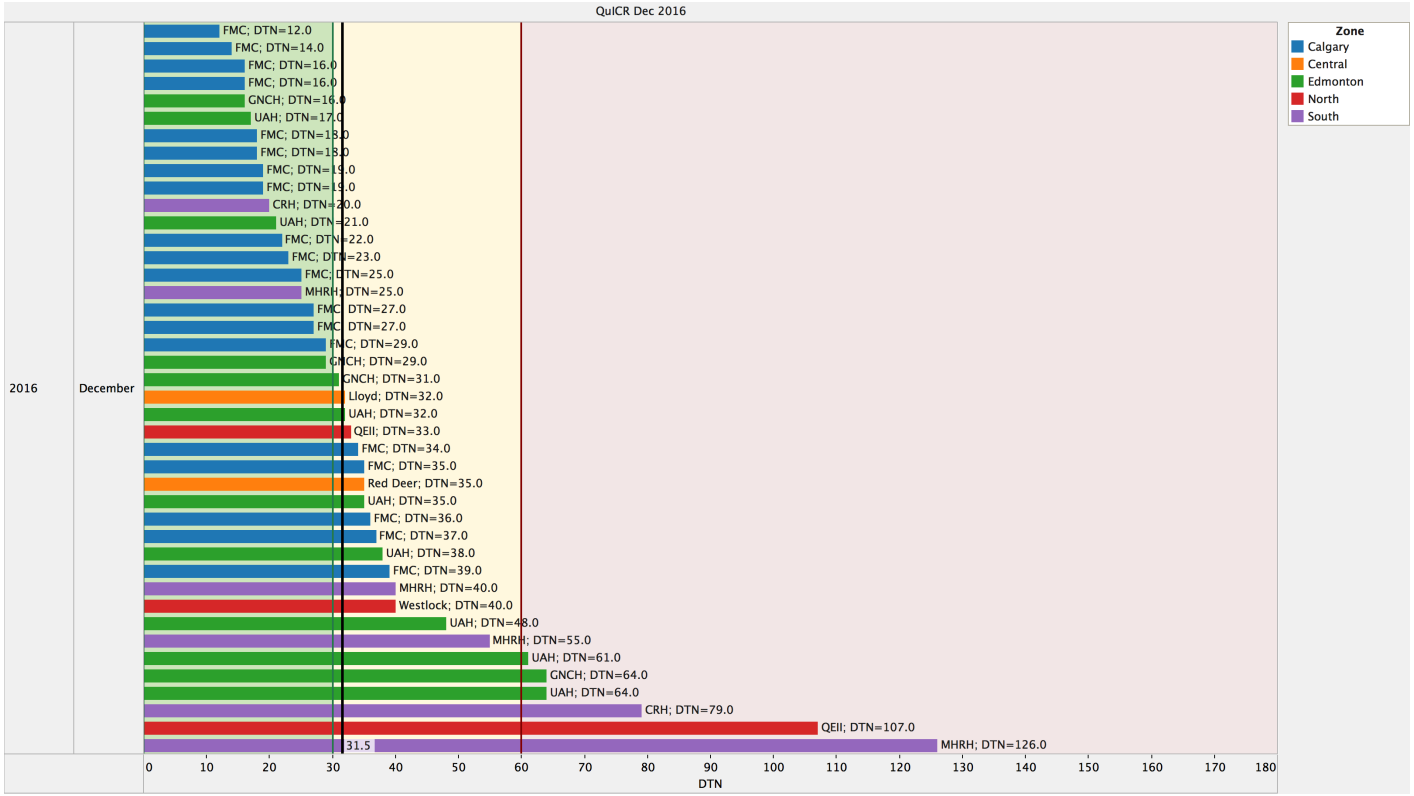


Sep 2015 – Feb 2016



Oct 2016 – Mar 2017

Best Month (Dec 2016)



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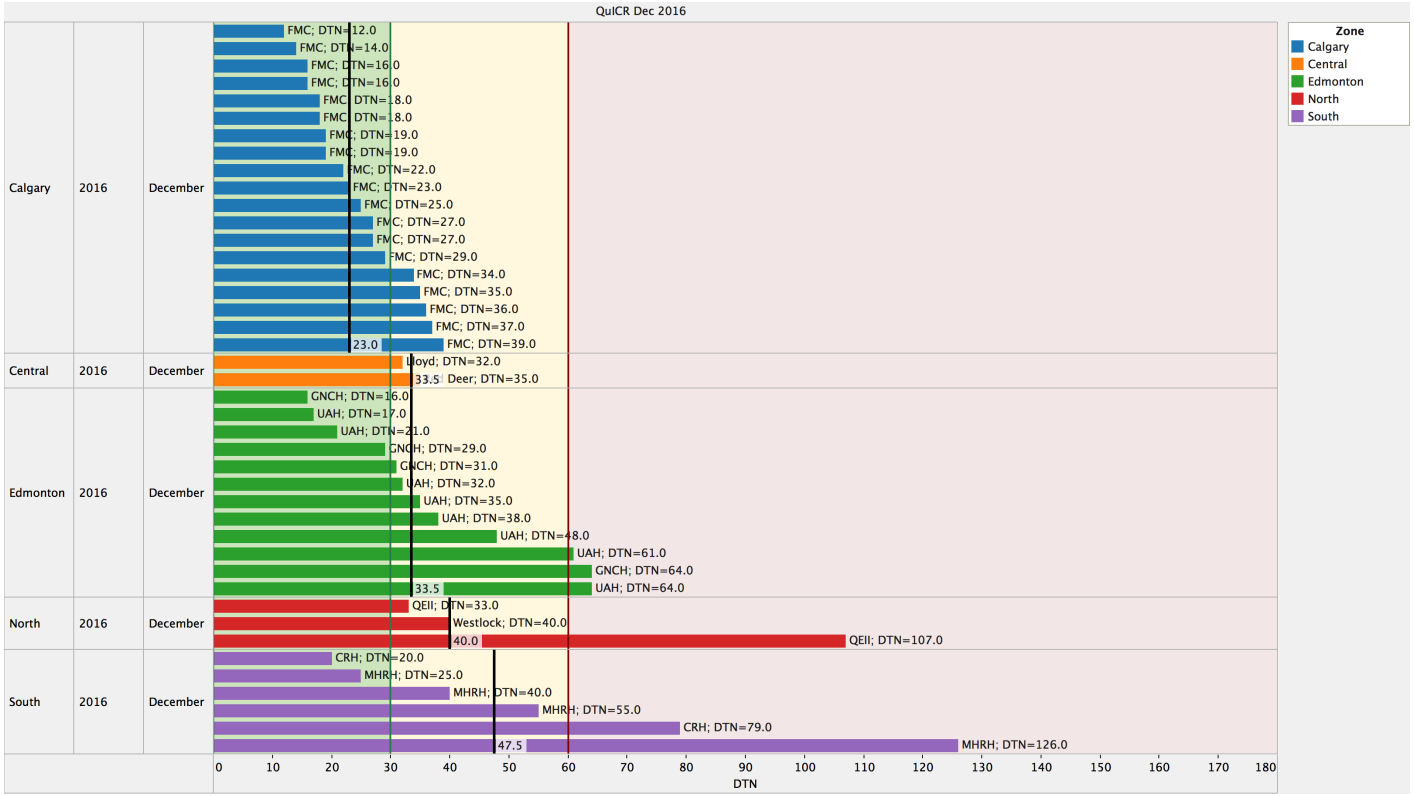
Best Month (Dec 2016)



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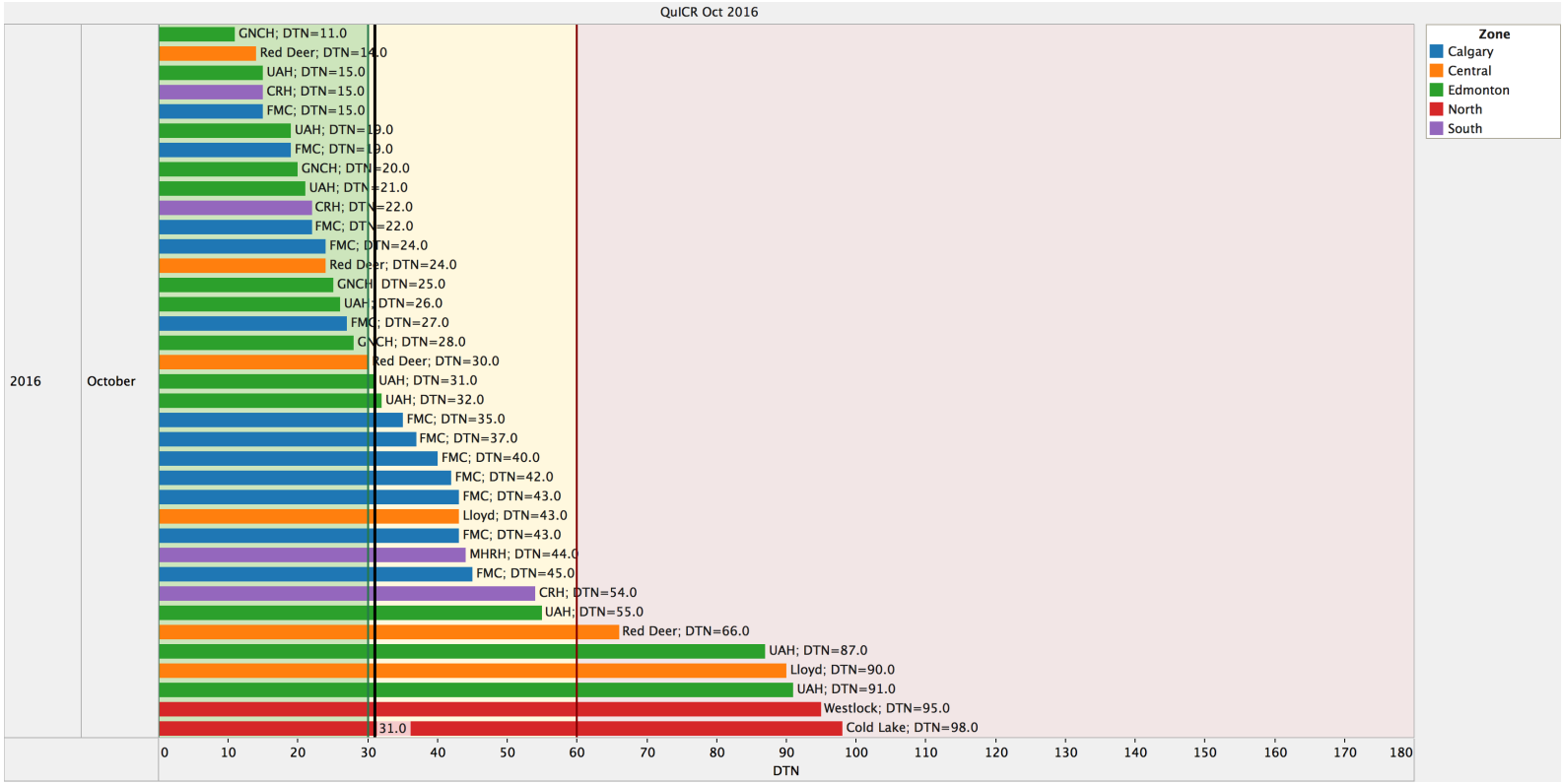
Best Month (October 2016)



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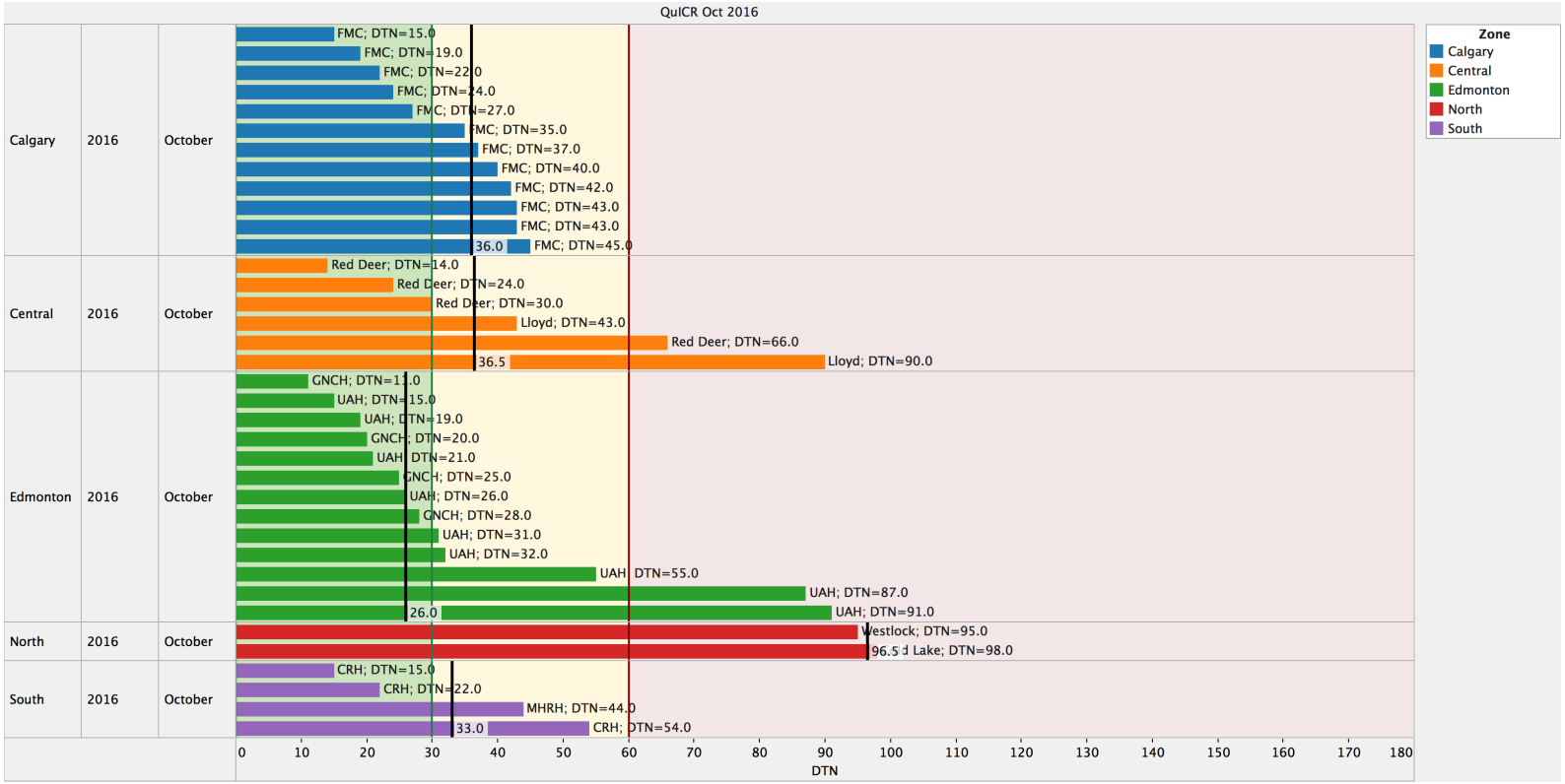
Best Month (October 2016)



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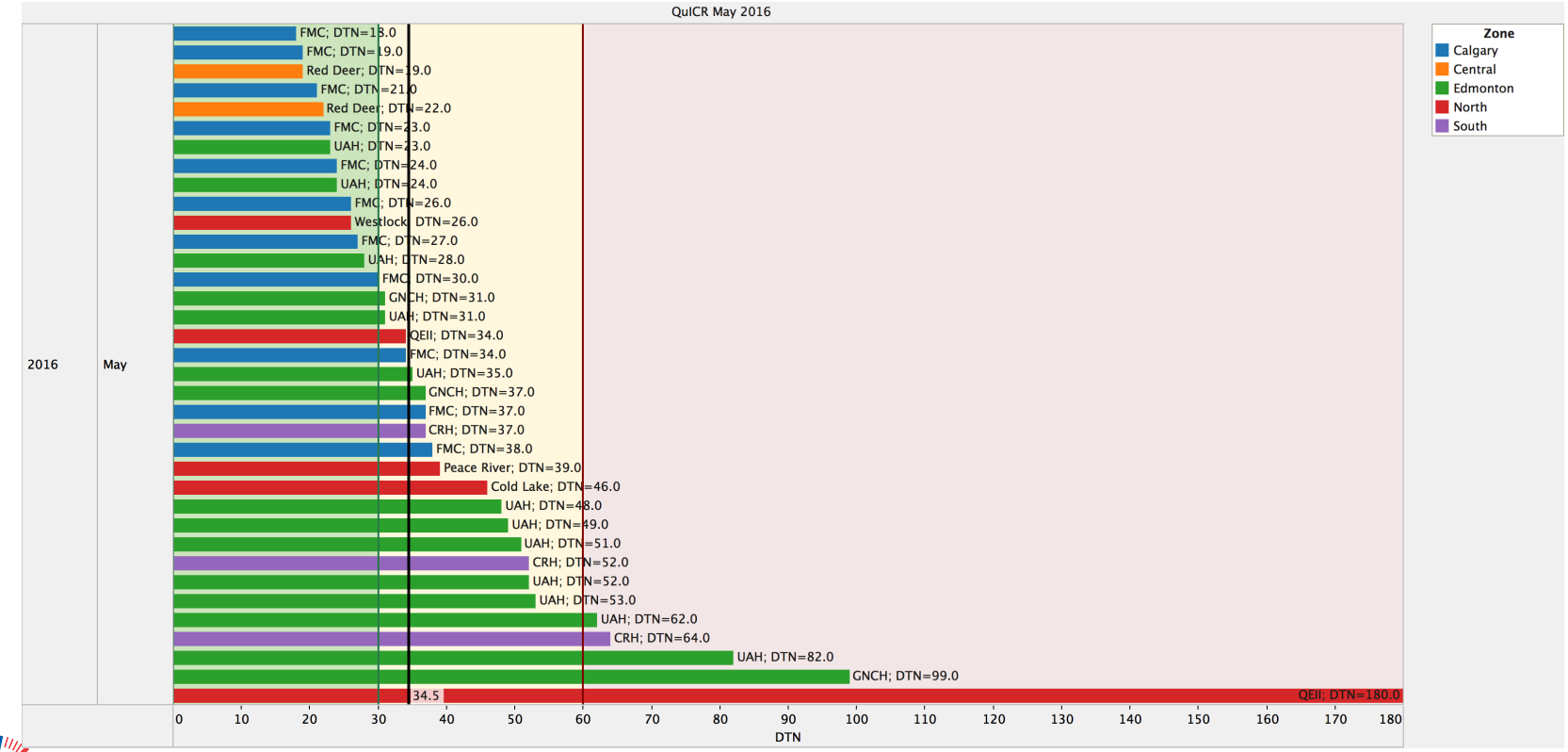
Best PSC Month (May 2016)



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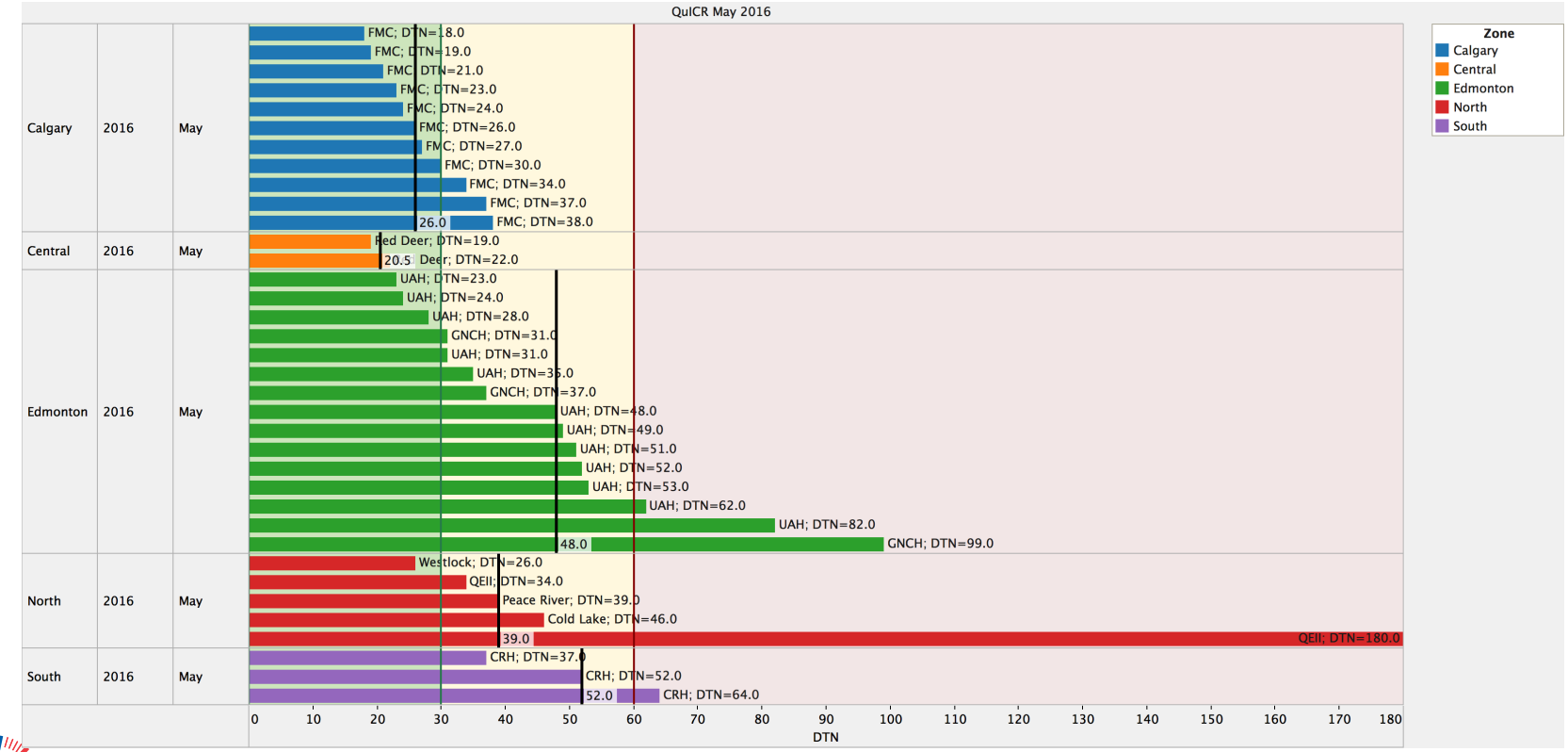
Best PSC Month (May 2016)



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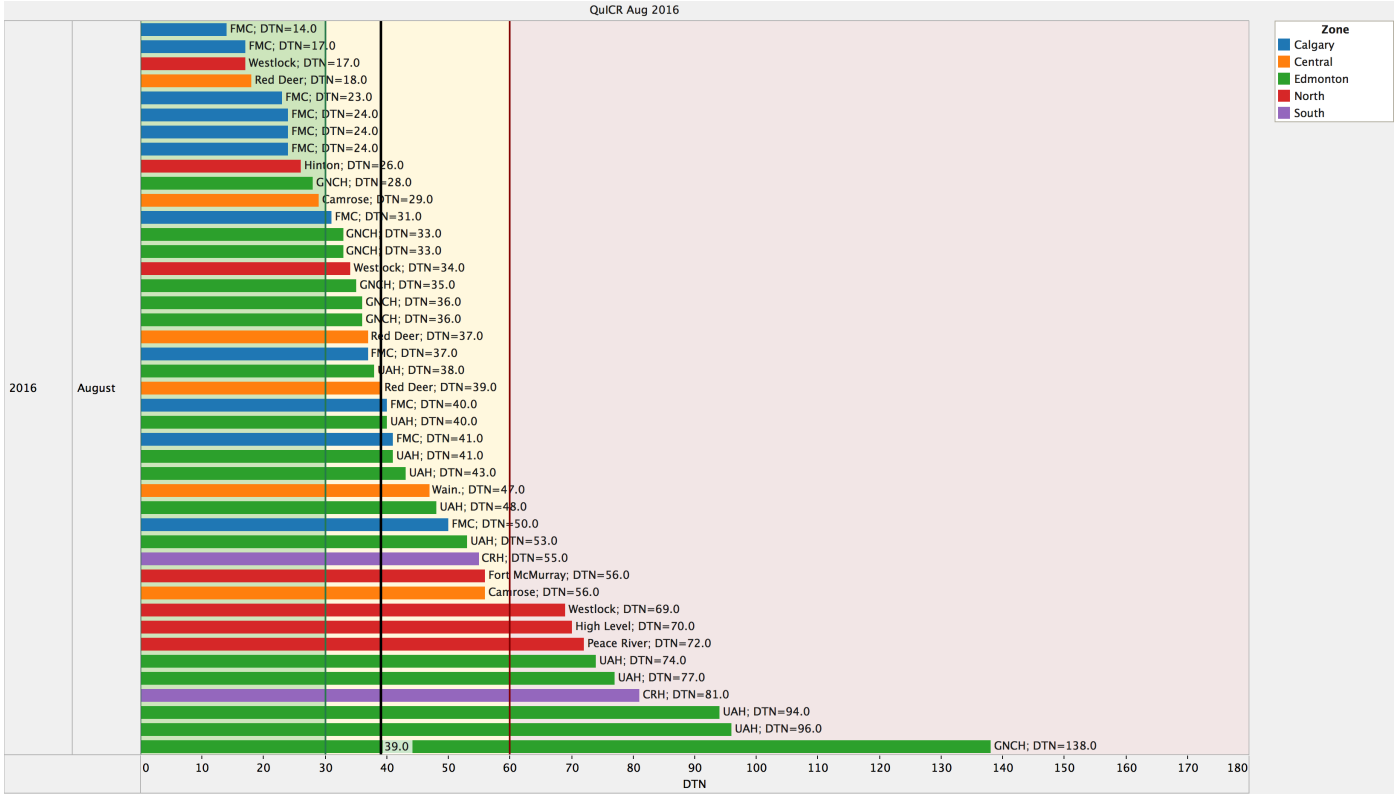
Best PSC Month (August 2016)



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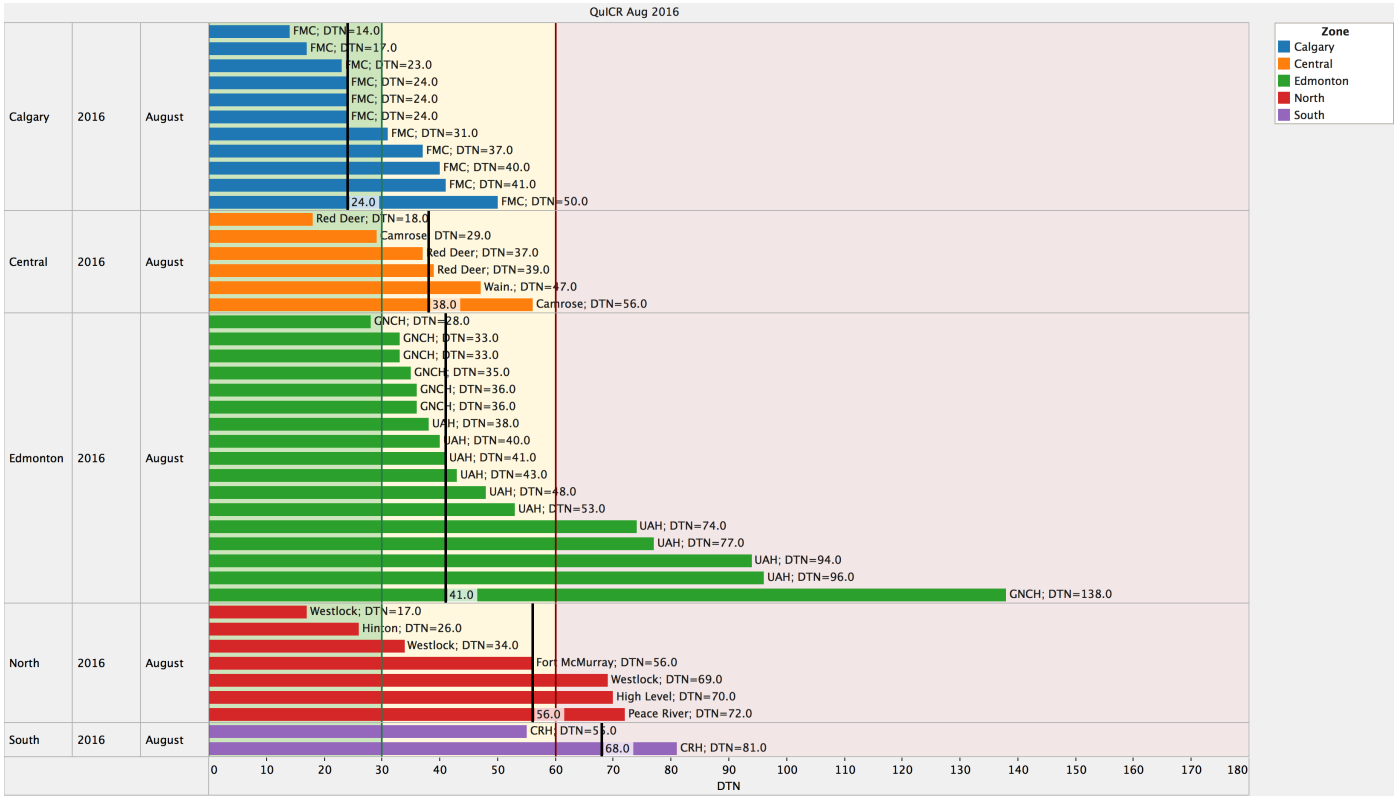
Best PSC Month (August 2016)



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Summary

- Continue to push DTN time down
- Feedback performance to:
  - Your site team
  - The care team involved
  - Telestroke service and RAAPID
- Celebrate successes

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Next Steps for Stroke Centres:

- Reduce Door-In-Door-Out times (for EVT)
  - Target a median of 45 minutes
- Reduce time to alteplase treatment for stroke that occur in hospital
  - Target a median Recognition-to-Needle of 30 minutes

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