

Goodman SG¹, Mackinnon ES², Grégoire JC³, Raggi P⁴, Wani RJ², Packalen M², Avcil S², Farris MS⁵, Graves E⁵, Cowling T⁵, Anderson TJ⁶

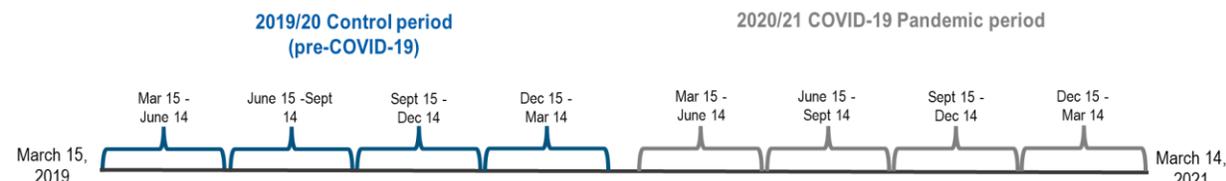
¹Division of Cardiology, St. Michael's Hospital, Toronto, ON, and Canadian VIGOUR Centre, University of Alberta, Edmonton, AB; ²Amgen Canada Inc., Mississauga, ON; ³Institut de Cardiologie de Montréal, Université de Montréal, Montreal, QC; ⁴Mazankowski Alberta Heart Institute, University of Alberta, Edmonton, AB; ⁵Medlior Health Outcomes Research Ltd. Calgary, AB; ⁶Libin Cardiovascular Institute, Cumming School of Medicine, University of Calgary, Calgary, AB

INTRODUCTION

- Atherosclerotic cardiovascular disease (ASCVD) is a leading cause of morbidity and mortality in Canada and worldwide. Laboratory tests, including troponin and low-density lipoprotein cholesterol (LDL-C), are important biomarkers of ASCVD risk.
- Our objective was to investigate patterns of testing for troponin and LDL-C test volumes among Alberta residents during the COVID-19 pandemic.

METHODS

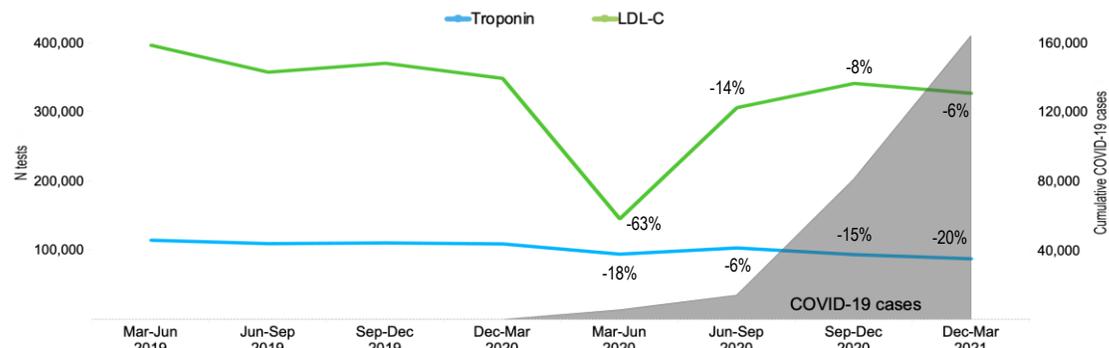
- A repeated cross-sectional study design captured population-level laboratory test volumes between March 15, 2019, and March 14, 2021.
- Three-month cross-sections were derived to report laboratory test volumes by different COVID-19 restriction periods during 2020-2021 and using 2019-2020 as a preceding control period.
- Percent change for troponin and LDL-C test volumes were calculated for both control and COVID-19 periods among adult (≥18 years of age) Alberta residents. These results were also stratified by age (18-49, 50-65, 66-79, and ≥80 years), sex, and geographic zones (urban, rural).



RESULTS

- Among the Alberta population, 381,007 troponin and 1,122,413 LDL-C tests were captured between March 15, 2020, and March 14, 2021, relative to 445,690 troponin and 1,475,636 LDL-C tests between March 15, 2019, and March 14, 2020.
- Testing patterns during the COVID-19 restriction period showed marked reduction in test volumes from the previous year.
- The initial cross-section of the COVID-19 period (Mar-June 2020) was characterized by the largest overall reduction, with troponin test volumes decreasing by **18%** (20,152 fewer tests) and LDL-C test volumes decreasing by **63%** (251,217 fewer tests), compared to the year prior.
- As restrictions eased in the summer months of 2020, testing volumes rebounded to near pre-pandemic volumes for both tests. However, in the winter of 2020/21, troponin tests decreased again (-20%; 21,477 fewer tests).

Figure 1. Laboratory test volumes and cumulative COVID-19 cases across Alberta in control and COVID-19 periods



Abbreviations: COVID-19: coronavirus disease 2019; LDL-C: low-density lipoprotein cholesterol; N: number.
Note: Cumulative COVID-19 cases were derived from Alberta Health Interactive Data Application.

STRATIFIED RESULTS

- Within the observed decreases in utilization, slightly larger relative declines were observed for troponin tests in women (-20%) and patients ≥80 years-old (-25%) and for LDL-C test volumes among urban residents (-64%), women (-67%) and patients 18-49 (-66%) and 50-65 (-65%) years old.

Table 1. Laboratory test volumes in the Mar-June 2020 control and COVID-19 periods stratified by age, sex, and geographic zone

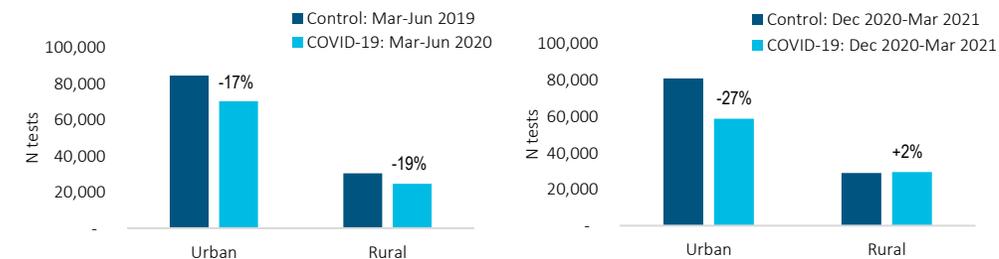
Stratifications	Troponin			LDL-C		
	Control, n	COVID-19, n	Control to COVID-19, % Change	Control, n	COVID-19, n	Control to COVID-19, % Change
Age, years						
18-49	27,410	24,815	-10%	141,728	48,673	-66%
50-65	32,824	27,235	-17%	146,523	50,872	-65%
66-79	31,712	25,419	-20%	85,523	32,635	-62%
80+	23,034	17,359	-25%	23,411	13,788	-41%
Sex						
Female	53,861	43,217	-20%	201,095	67,068	-67%
Male	61,119	51,611	-16%	196,090	78,900	-60%
Geographic zone ^a						
Urban	84,525	70,175	-17%	324,098	115,878	-64%
Rural	30,455	24,653	-19%	73,087	30,090	-59%

Abbreviations: COVID-19: coronavirus disease 2019; LDL-C: low-density lipoprotein cholesterol; n: number.

^a The geographic zone stratification was derived based on the Alberta Health Services geographic zones and were dichotomized as urban (Calgary, Edmonton) and rural (Central, North, South).

- In the initial COVID-19 period (Mar-June 2020), reductions in troponin testing were similar across urban and rural regions (-17% vs. -19%). However, in the Dec 2020-Mar 2021 COVID-19 period, reductions in urban troponin test volumes were larger (-27%), relative to rural zones (+2%).
- Urban and rural LDL-C test volumes did not vary across COVID-19 periods.

Figure 2. Troponin laboratory test volumes in the March 15-June 14 (left) and December 15-March 14 (right) periods, stratified by geographic zone



CONCLUSIONS

- This study observed decreases in troponin and LDL-C test volumes in the COVID-19 lockdown periods across Alberta. Women had smaller overall total troponin and LDL-C test volumes and larger relative declines during the pandemic.
- The decrease in these ASCVD-related laboratory test volumes during the pandemic may have been accompanied by other important changes in indicators of healthcare utilization and associated clinical outcomes. Ongoing analyses will further explore the impact of the pandemic in this patient group.

ACKNOWLEDGEMENTS

This study is based on data provided by Alberta Precision Laboratories (APL). The interpretation and conclusions contained herein are those of the researchers and do not necessarily represent the views of the Government of Alberta. Neither the Government of Alberta nor APL express any opinion in relation to this study.

DISCLOSURES

This study was sponsored by Amgen Canada Ltd (Amgen). Farris MS, Graves E, and Cowling T are employed by Medlior Health Outcomes Research Ltd., which received funding for the study from Amgen. Mackinnon ES, Wani RJ, Packalen M, and Avcil S are employed by Amgen Canada who funded this study. Mackinnon ES, Wani RJ, Packalen M, and Avcil S also hold Amgen stock. Goodman SG has received research grant support and/or speaker/consulting honoraria from Amgen, AstraZeneca, CSL Behring, Esperio, HLS Therapeutics, Novartis, Pfizer, Regeneron, and Sanofi. Grégoire JC has received consulting/Speaker's Bureau honoraria from Amgen, Novartis, and Sanofi. Raggi P has received Speaker's Bureau honoraria from Amgen, Johnson & Johnson, and Sanofi. Anderson TJ has no conflicts to disclose.