

The Serologic Prevalence of SARS-CoV-2 Amongst Incarcerated Persons in Provincial Correctional Facilities in Saskatchewan

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Introduction

The Regina Provincial Correctional Centre (RPCC) houses 600-700 inmates at any given time with a high turnover rate. The COVID-19 Immunity Task Force (CITF) and ID Clinic conducted a study to determine the prevalence of SARS-CoV-2 antibodies throughout RPCC. This included a lifestyle survey and serologic COVID-19 antibody testing to better understand rates of infection and antibody prevalence inside a Saskatchewan correctional setting.

Objective

To determine the proportion of persons in a large men's provincial correctional facility in Saskatchewan exposed to SARS-CoV-2, either through natural infection or immunization, and whether exposure correlates with demographics, lifestyle factors, social distancing practices, and chronic disease status using a comprehensive survey.

Methods

Poster advertisements were used to recruit 400 participants at Regina Provincial Correctional Centre. Informed consent was obtained and participants completed a comprehensive survey along with phlebotomy for SARS-CoV-2 nucleocapsid and spike antibody proteins.

Up to and including participant 121, serologic testing was performed using a qualitative DiaSorin Liaison anti-S1/S2 protein assay. After participant 121, testing was performed using the DiaSorin semi-quantitative anti-trimeric anti-S and anti-N assays in which the nucleocapsid protein was separated out to better differentiate between natural infection and vaccination. Participants were notified of their serologic results either in-person or, if released, remotely via telephone.

Results

Of 400 participants, the majority ethnicities included 63% self-identifying as Indigenous, 31% as Caucasian, and 4% as mixed, with a median age of 33 (Figure 1).

Serologic testing using the semi-quantitative anti-trimeric anti-S and anti-N assays revealed 40.5% (113/279) of participants were positive for both nucleocapsid and spike proteins. Conversely, only 4.3% (12/279) were negative for both (Figure 2). Initiation of the semi-quantitative anti-trimeric anti-S and anti-N assays produced a 59% decrease in the number of inconclusive results. Separating the nucleocapsid protein revealed a high number of positive spike protein results at 94.3% (263/279) (Figure 3). Re-analysis of the initial 121 participant samples with the anti-trimeric assay is pending.

Figure 1. Proportion of ethnicities and age ranges.

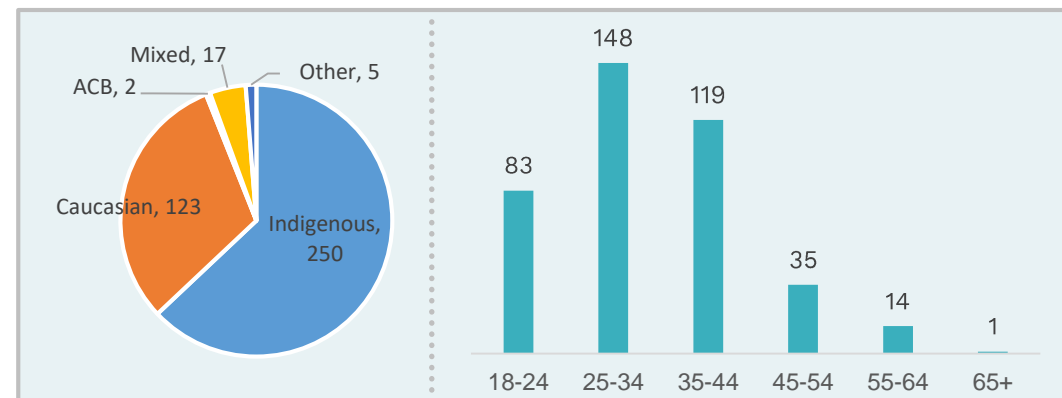
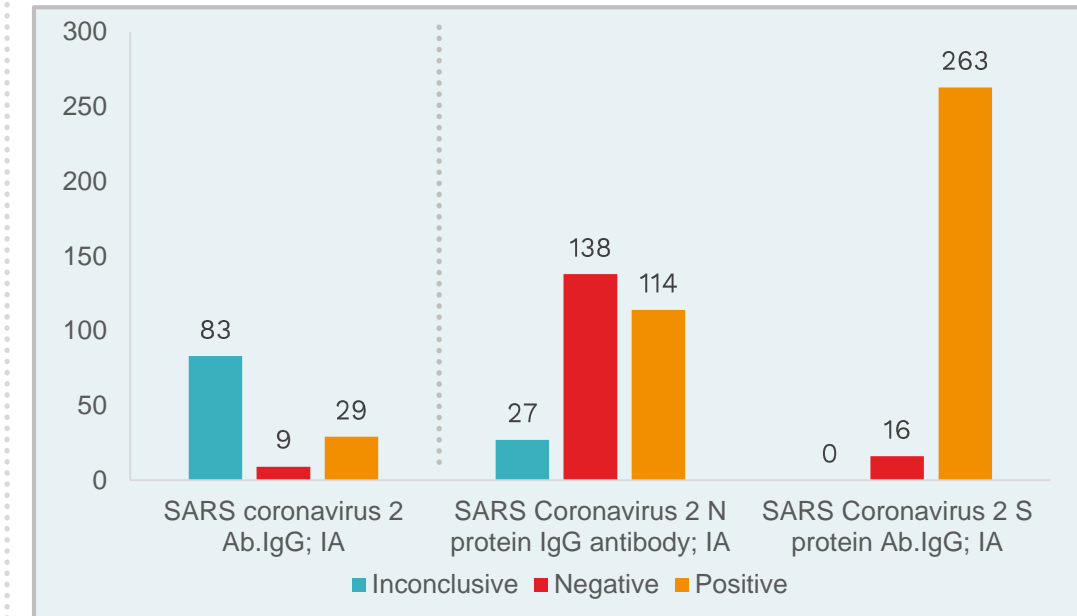


Figure 2. COVID-19 serology results for final 279 participants.

	SARS-CoV-2 S Ab+	SARS-CoV-2 S Ab-
SARS-CoV-2 N Ab+	113	1
SARS-CoV-2 N Ab-	126	12
Inconclusive	24	3

Figure 3. Comparison of old and new serologic antibody tests.



Lessons Learned

Challenges faced during recruitment included multiple COVID-19 outbreaks which limited access to the facility, human resource challenges, and maintaining ongoing communication at the facility regarding the study and its outcome and purpose. Regular communication between our study site and RPCC as well as identifying and supporting a facility champion for the study could have expedited recruitment and completion of the study.

Acknowledgements

We wish to acknowledge the RPCC leadership and staff including Karen Merkle, Delphine Gossner, Maurice Munro, Kim Skinner, Rakesh Jayarajan, Betty-Lynn Halcro and Julie Poitras and many others. We are grateful for the excellent collaboration, help and support in completing this important work. We also acknowledge the important scientific and financial support from the CITF. Lastly, we thank all participants and their families for helping contribute to this important work.