Supplemental materials for

Leslie M, Hansen B, Abboud R, et al. Building a data bridge: policies, structures, and governance integrating primary care into the public health response to COVID-19. *Ann Fam Med*. 2023;21(1):4-10.

Supplemental Appendix 1. Primary Care, Public Health and COVID-19 in Alberta

Appendix 1 - Primary Care, Public Health and COVID-19 in Alberta

Alberta recorded its first COVID-19 case on March 6, 2020.[30] The province immediately mounted an integrated public health response[25] which included centrally managed testing and contact tracing programs that were executed at the health zone level.[31] Alongside movement restrictions and masking mandates, walk-in and drive-through testing centres were created to collect samples from patients in the community with eligibility thresholds for booking a test, and processes for communicating results to patients, evolving over time. The testing centres as well as the lab facilities to handle the large volume of samples were financed and managed by the provincial government, with AHS personnel in the Health Zones generally taking charge of local sample collection, and Alberta Public Labs (APL) processing the samples and entering results into an electronic database.

Alongside central AHS Public Health's efforts to collect and electronically record test results, independent PC also mounted a range of responses to the pandemic. In the Calgary Health Zone, the PCNs leveraged four already active 'Access Clinics,' re-designing them specifically to serve patients with SARS-CoV-2 and their families. As the first wave began, AHS public health staff had access to the APL database of positive and negative test results, but not to individual patient records as held by PC clinics. In turn, PC clinicians did not receive notifications about their patients' test results. This is to say, AHS public health personnel in the health zones were able to access the data they needed to run their contact tracing programs, but independent PC teams were not informed of a given patient's SARS-CoV-2 status or any need for follow-up care.

Supplemental Appendix 2: Study Design

In the broader project from which the data quoted here were taken, we deployed a mixed-methods, concurrent triangulation study design. This design gathers qualitative and quantitative data at the same time comparing them to determine if there is convergence, divergence, or some combination.[32] To gather the qualitative data used in the present paper, we conducted semi-structured interviews with a broad range of stakeholders who were identified using both purposive and snowball sampling techniques. We conducted the interviews (n=57) between

January and March 2021. Almost all interviews were conducted one-on-one, with two interviews that included two or more participants. The study population included persons working for the Public Health (n=1), and Primary Care (n=5) divisions of AHS; the Calgary Health Zone's Primary Care Networks (PCNs) (n=36); and clinicians in both independent (n=10), and AHS-run (n=3) PC clinics in the Health Zone.

A range of stakeholders were represented: 59% were from PCNs in the Calgary Zone (n=37, Clinical Managers, Executive Leadership, Data Analysts), 3% were Zone Business Unit staff (n=2, Project Manager and Director), 16% were AHS staff (n=10, Executive Clinical Directors, Program Managers, Data Managers, and Physicians), 13% were community physicians (n=8, connected to PCNs in the Zone)

Recruitment and Interview Protocol

To recruit representatives from AHS, PCNs and community physicians, an e-mail invitation was sent out by the PCN Zone Business Unit to individuals identified by the Research Committee. The Research Committee was comprised of 8 members, including primary care and public health physicians, academic researchers, and staff from Calgary and Area PCNs. The committee was formed for the purpose of studying how the PC response to COVID-19 played out in the Calgary Zone. Members were selected by invitation based on their familiarity with Calgary's PC system. A total of 79 individuals were invited to participate in the study. 57 individuals representing AHS, PCNs, and community physician stakeholder groups responded to the invitation to take part. These responses resulted in 57 interviews lasting between 45 and 75 minutes (average length = 60). Interview participants were emailed an informed consent form prior to participation, and verbal consent was obtained and recorded at the beginning of the interview. Participants were provided with the interview guide (see appendix 1) so they could consider the

questions in advance. Interviews explored various aspects of the data bridge, focusing on who was involved in the development of the information sharing infrastructure; why/how processes evolved; and how PC physicians ultimately used the testing data and information that were distributed through the infrastructure. Open-ended, narrative interviewing techniques were used to encourage participants to discuss their thoughts and experiences in whatever order and manner they felt was most meaningful. Narrative interviewing[33] is a method of qualitative data collection whereby the participants speak to their own experiences for the researcher, allowing them to prioritize their perspective rather than adhering to a strict agenda. While a semi-structured research guide was used to probe and ask questions, the interviewers followed the participant's lead in terms of what they prioritized as important to share based on their experiences. Summary field notes were produced immediately following each interview to rapidly capture emerging themes and observations from the interview.

Interviews were conducted over Zoom and audio-recorded and transcribed verbatim. This study was approved by the University's Conjoint Health Research Ethics Board (REB20-0959).

Analysis

This project utilized the Interpretive Description approach. This involves an agile and continuous relationship between data collection and analysis, with interviews being conducted and field notes taken to capture the observations made during the interviews to help contextualize the data during analysis.[34] Once the interviews were completed, both of the two core analysts reviewed the transcripts and field notes in detail several times to develop a comprehensive sense of the data. From these reviews a set of provisional themes that were subject to modification or removal were identified and open coding was performed, assigning a conceptual code to each segment of the text to classify and organize the data. Coding employed constant comparative analysis,

whereby each code was developed in consideration of all the other codes to determine analytic distinctions.[35] The analysis was considered complete when no new codes emerged and the established themes adequately described the patterns in the data, thus indicating theoretical saturation.

Supplemental Appendix 3. Interview Guide

This is a study about a pair of interventions that have been labelled the "COVID-19 Integrated Pathway" (the CIP). Those interventions are: 1) a ***data pathway*** between provincial lab services, public health, AHS primary care, and PCN primary care, and 2) a ***clinical algorithm*** created to support family physicians in delivering care to SARS-COV-2+ patients. You might know this second one as: ***The COVID-19 Clinical Pathway.*** We want to understand the people, organizations, and relationships that made both of these elements of the CIP come together initially; change over time; and potentially spread across the province.

Q1: Is the CIP in one, or both, of these interventional forms, a label or activity that you've come across since the pandemic started?

Q1FU1: If yes, when and in what capacity? If no, end interview.

Q1FU2: Were you part of designing, delivering, or updating either or both parts of the CIP?

Q1FU3: How so, what was your role specifically?

Q1FU4: How did you come to have that role?

Q1FU5: Did that role change over time?

Q2: How, if at all, have the two interventions in the CIP–the ***data pathway***, and the ***clinical algorithm*** – shaped your work during, or experience of, the pandemic?

Q2FU1: Do you see the two interventions as related?

Probe: We have begun to see the clinical algorithm as the end point of the data pathway, but are not sure how much uptake of the clinical algorithm there is amongst clinicians.

Q2FU2: Do you see places where one or both of the interventions could be made more effective?

Focusing in on the ***data pathway***, I'd like to talk about how you saw it evolve over the course of the pandemic.

Q3: What, in your mind, made it necessary/desirable in the first place?

Q3FU1: What has worked well with the data pathway?

Q3FU2: What challenges have there been?

Probe: technology, policies, communication, resources

Q4: Were there particular people or organizations that made that first iteration possible?

Q4FU1: Who were they?

Q4FU2: How did they share their ideas?

Q4FU3: How did they gain consensus/buy in/resources for the idea?

Q4FU4: Are any of those people, organizations, meetings, or consensus techniques critical to the export of the idea to another zone?

Q4FU4FU1: If yes, which ones and how so?

Q4FU4FU2: Can you think of ways that the idea might be exported or scaled without some or all of those people, organizations, meetings, or consensus techniques?

Q5: How did you, or others, determine that the pathway process needed to be adjusted/evolved (i.e., what were the signals?)

Q5FU1: What resources or relationships made those adjustments/evolutions possible?

Q6: Were there particular people or organizations that made the evolutions and iterations possible?

Q6FU1: Who were they?

Q6FU2: How did they share their ideas?

Q6FU3: How did they gain consensus/buy in/resources for making the changes?

Q6FU4: Are any of those people, organizations, meetings, or consensus techniques that are, in your mind, critical to the export of the idea to another zone?

Q6FU4FU1: If yes, which ones and how so?

Q6FU4FU2: Can you think of ways that the idea might be exported or scaled without some or all of those people, organizations, meetings, or consensus techniques?

Q7: What, in your experience, was the most important or salient element of the ***data pathway*** of the CIP?

Prompt (data capture, data management, patient attachment, patient contact)

Q7FU1: How so?

Q7FU2: Were there particular benefits or drawbacks to this data pathway?

Focusing in on the ***clinical algorithm – which you may know as the COVID-19 Clinical Pathway*** - I'd like to talk about how you saw it evolve over the course of the pandemic

Q8: Did you and/or your colleagues make use of the ***clinical algorithm***?

Q8FU1: **If yes**, How does the algorithm fit into your clinical management practices for COVID-19 positive patients?

Are there benefits and/or drawbacks?

Have you developed new protocols or workaround in your practice, or EMR to deal with these?

How have you handled the scheduling and delivery of follow up calls, particularly for high risk patients who may need follow up in off hours?

How is the algorithm facilitating, or hindering the transfer of care responsibility from AHS-PH/C4/PCN Access into your clinic?

What, if anything, could be improved?

How do you find patients are reacting to the follow ups or other algorithm-induced interventions you are making?

Q8FU2: **If no**, or limited use, What were the factors that drove your decision not to use the algorithm?

Q9: Do you see the ***clinical algorithm*** as integrating with the ***data pathway***?

If the CIP – both the clinical algorithm and the data pathway – were an attempt to integrate Provincial lab services, AHS Public Health, AHS Primary Care, and the PCNS,

Q10: Was the attempt at integration successful?

Q10FU1: If yes, what would be required to move this integrative approach outside the Calgary Zone?

Q10FU2: If no, are there any factors that should be considered in improving the CIP's capacity to integrate these parts of the health system?

If NO: What tools are you using to manage your patients (Prompt – inside your EMR? Via college or AMA? Nothing at all? How do you manage

Q11: Any thing else? Who else should we be interviewing on this topic?