



MANAGEMENT FRAMEWORK OF THE QUEBEC COVID-19 BIOBANK (BQC19)

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THE ROYAL INSTITUTION FOR THE ADVANCEMENT OF LEARNING (RIAL)/ MCGILL UNIVERSITY, having its head office is located on 845 Sherbrooke W street, Montreal, Quebec, Canada.

VERSIONS HISTORY

Date DD/MM/YYYY	Version	Description of the modification
03/06/2020	03	Approved version by the BQC19 Governing Committee
11/09/2020	04	Revision of sections 8 and 9 (addition of roles of the BQC19 staff and detailed description of the sample and data access process) Approved version by the BQC19 Governing Committee Precision on the hosting of biological data and Material, the security of data transfer, the centralized data processing system and the intellectual property and marketing.
09/10/2020	05	Removal of problematic sentence with the inter-institutional agreement (section 9.5). Modification of the affiliation of Catherine Laprise, PhD, Karine Tremblay, PhD and Luigi Bouchard, T.M/R.T., PhD
05/11/2020	06	Remove problematic sentence with the inter-institutional agreement (section 9.5) and restate the previously removed sentence that was not problematic with the inter-institutional agreement.
24/11/2020	07	Insertion of an advertisement in the participant recruitment process (Section 5.1.3). Inclusion of a section on the core analyses to be performed by the BQC19 (section 7). Inclusion of a section on data sharing with the partnerships initiatives (section 10.8) : Sharing of data collected by the BQC19 through partnerships (section 10.8.1) and the CGEN HostSeq (section 10.8.2)
18/12/2020	08	Inclusion of the IRCM site and Emilia Liana Falcone, MD, Ph D. to the BQC19. Corrections typos in text. In 5.3.1, replace the terms « T » with « J » and months by days in order to standardize the information in the Management Framework and the EII (budget). In the Core Analyses table, row « basic laboratory for non-hospitalized patients, the sentence « on the non-hospitalized patients (cohort 2) » has been removed.
15/04/2021	09	Information regarding the appointment of a new Chair for the Governing Committee, modifications in the participant selection criteria (inclusion and exclusion criteria, changes in the longitudinal follow-up for both populations), modifications/clarification regarding data returned to the BQC19, clarification regarding the process of collecting test results (no results but a note mentioning the completion of the test), a, addition of Guillaume Bourque to the Steering Committee, deletion of Michaël Chassé from the Steering Committee;
23/07/2021	10	Addition of Madeleine Durand to Steering Committee; update of Section 10 : Access Committee of the BQC-19; update of points 6.1 to 6.3 of Section 6 : Storage of Biological Material and Data; adjustment of responsibilities of the BQC19 coordinator and access officer, addition of ethics coordinator from the CHUM; addition of Appendix 3A : MUHC Biobank Management Framework and 3B : IUCPQ Biobank Management Framework
30-09-2021	11	Addition of Dr. Jean Paul Praud at Université de Sherbrooke; Correction of typos and clarifications; Removal of the CIUSSS de l'Ouest-de-Île-de-Montréal site (Douglas Mental Health University Institute) site; Appending the BQC19 management framework for the JGH site in Annex 3C; Addition of details in section 5, as well as Annex 4A, detailing the methods of contacting potential participants by text message to offer participation in the BQC19; Addition of

		the month 18 (day 545) visit, which was removed in previous versions of the BQC19 management framework; Addition of the role of data manager; Addition of the role of participant engagement and knowledge transfer coordinator; Addition of the role RAMQ data access coordinator; Clarifying the methods of access and provision of experimental data from local researchers to other BQC19 collaborators; Addition of details related to security requirements when downloading BQC19 data via the Globus application.
14-12-2021	12	Addition of a paragraph to section 6.1.1. detailing the instances and modalities by which nominal data will be shared with the BQC19 data management team in order to gain access to medico-administrative data from provincial institutions external to the BQC19; Addition of Appendix 5A : Transfer of nominal data to institutions external to the BQC19; Removal of the site CIUSSS de l'Est de l'Île de Montréal (Maisonneuve Rosemont Hospital); Addition of details regarding the core analyses performed by the Laboratoire nationale de microbiologie; Update of the BQC19 website; Addition of Christel Renoux, in her role as data access coordinator, to the BQC19 Steering Committee
07-11-2022	13	Modification in the co-direction of the BQC19; Precision that the site 'CIUSSS du Saguenay-Lac-Saint-Jean' also includes 'Université de Québec à Chicoutimi'; Precision that Dr. Catherine Laprise is associated with the 'CIUSSS du Saguenay-Lac-Saint-Jean / Université de Québec à Chicoutimi' site; Addition of Simon Décary to the steering committee; Addition of section 5.2.3 "Reinfected participants" specifying the procedures for the collection of additional samples from participants who are rehospitalized for COVID; Addition of sub-paragraphs to section 10.8.2 "BQC19 partner initiatives" detailing the partnership between BQC19 and EGA; Added section 8.3 "Discovery platforms and data visualization"; Adjustments to section 9.2 (Steering Committee) and 9.4 (Coordinators)
14-12-2023	14	Addition of the Section 10.4.3 : <i>Access provided to reviewers</i> to define the level of access that will be provided to reviewers of scientific publications using BQC19 data.
21-05-2024	15	Update of section 6.1.1 : <i>BTRSR Database Structure and Principles</i> , indicating that BENTO, the cloud-based data sharing platform, is now housed within the servers of SecureData4Health. The SecureData4Health servers will replace those from Calcul Quebec (Beluga).
04-10-2024	16	Update of section 6.1 (Data Storage), and section 6.4 (Privacy and Confidentiality) detailing how nominal data will now be saved in RedCAP (instead of the BTRSR Local), and that sample inventory management will be done in AtiM (instead of BTRSR Network); Update of <i>Figure 1 – Database architecture and detail on utilization of each different identifier</i> & <i>Figure 2: Database architecture and the content of each different database</i> to reflect this new database architecture.
27-02-2025	17	Addition of the section 10.8.2.3 describing the partnership between BQC19 and the Pan-Canadian Genome Library (PCGL).

*excluding appendices

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PREAMBLE

This Management Framework contains the operating rules and procedures of the Quebec COVID-19 Biobank (BQC19). The BQC19 was established following an emergency mandate received from the *Fonds de recherche du Québec - Santé* (FRQS) and Génome Québec (GQ) to provide Québec with a provincial infrastructure for the banking of samples and data that can be used by the scientific and medical community to better understand, fight, and ultimately limit the impact of COVID-19.

This Management Framework was drafted during the public health emergency declared on March 14, 2020, in order to rapidly put in place an infrastructure efficient in mobilizing samples and data from people infected with COVID-19 during the pandemic. Given the urgency of the situation and the challenge of undertaking such an exercise, this Management Framework is being developed and approved in several distinct phases to both address the urgent need to start the operations, while respecting the core values of ethics and transparency. This procedure will enable the BQC19 to be receptive to the realities on the ground, both scientifically and ethically, and will enable the Management Framework to adapt quickly to reflect these realities while remaining innovative, anticipatory and forward-looking.

1. OBJECTIVES AND DESCRIPTION OF THE BQC19

Research is essential to better understand the evolution and determinants of the SARS-CoV-2 infection responsible for the COVID-19, to identify those at risk and take appropriate measures to protect them, to help the government take social measures to control the spread of the infection, and to anticipate and be better equipped for future pandemics.

Access to high-quality biological Material and data from SARS-CoV-2 infected and uninfected patients is absolutely essential. The urgency and the magnitude of pandemics, as well as a proper resource management and the protection of personnel, dictate immediate action and coordination of efforts at the local, regional, national and international levels.

Following the initiatives put forward to find a solution to the COVID-19 pandemic, the FRQS and GQ have mandated a group of researchers to establish the BQC19.

This decentralized infrastructure will align the research efforts of all research institutions in Quebec and facilitate national and international research collaborations.

The mission of the BQC19 is to support the institutions of the health and social services network (HSSN) by facilitating the supervision and common resource management of the unique biological Material and data stored in the BQC19 in order to make them accessible for research on COVID-19 and related diseases. To this end, the academic partners of the HSSN also play an integral role.

The BQC19 ensures provincial coordination and identification of the expected standards of various banking infrastructures established in the HSSN institutions and federated to constitute the BQC19. The notion of sharing research results is at the heart of the BQC19 mission. More precisely, the BQC19 will support efforts to discover and develop new biomarkers of disease sensitivity and progression, therapies and vaccines that are new or re-directed to address COVID-19, as well as any research effort related to the prevention, treatment and epidemiological and population management of COVID-19. Finally, the BQC19 will encourage health research and precision medicine on COVID-19.

2. OWNERSHIP OF THE BQC19 INFRASTRUCTURE

The infrastructure required for the BQC19 is owned by the participating institutions.

The BQC19 includes several participating institutions of the health and social services network (HSSN), and each institution acts as a trustee with regards to the stored data and biological Material. A researcher is responsible for the BQC19 in each participating institution. The Lead Researcher is nominated by the participating institution. Every institution has the infrastructure necessary for the operation of the BQC19 and may use it for the hosting of the BQC biological Material and data as directed by the BQC19. A list of the infrastructure at each participating institution is available in Appendix 1.

BQC19 Participating Institution	Lead Researcher for the BQC19
Centre hospitalier de l'Université de Montréal (CHUM)	Madeleine Durand, M.D.
Institut universitaire de cardiologie et de pneumologie de Québec (IUCPQ)	François Maltais, MD, FRCPC
CIUSSS du Saguenay-Lac-Saint-Jean / Université de Québec à Chicoutimi (UQAC)	Karine Tremblay, PhD Catherine Laprise, PhD
CHU de Québec- Université Laval	Alexis Turgeon, MD
CHU Ste-Justine	Sze Man Tse, MD, FRCPC
CIUSSS du Centre-Ouest-de-l'Île-de-Montréal (Jewish General Hospital)	Brent Richard, MD, M. Sc.
McGill University Health Centre (MUHC)	Donald Vinh, MD, FRCPC, FACP
CIUSSS de l'Estrie- CHU de Sherbrooke	Alain Piché, MD, M. Sc., FRCPC
CIUSSS du Nord-de-l'Île-de-Montréal (Hôpital Sacré-Cœur)	Nicolas Gauthier, PhD, CSPQ, FCACB
CIUSSS de l'Est-de-l'Île-de-Montréal (Hôpital Maisonneuve-Rosemont)	Han Ting Wang, MD, FRCPC
Montreal Clinical Research Institute (IRCM)	Emilia Liana Falcone, MD, PhD

Other institutions may join the BQC19 in the future. Institutions wishing to join the BQC to recruit adult populations must submit an application to the Director of the BQC19. Applications to add new institutions to recruit pediatric populations must be made to Dr. Sze Man Tse. The required procedures to regulate the participation and ensure the safety of the pediatric populations are provided in Dr. Sze Man Tse study entitled « Biobank of samples and data for pediatric respiratory disease research » (Appendix 2 – approved documents of the CHU Sainte-Justine). At the MUHC, participation in the BQC19 and participant safety falls under the purview of the MUHC project COVID BB (MEO-02-2021-6576). The biobank management framework for the MUHC is in Appendix 3. Applications for the addition of new institutions will be forwarded to the BQC19 Governing Committee (see sections 3 and 9 of this Management Framework) for final decision.

2.1 BQC19: PROVINCIAL ET LOCAL COLLECTIONS

Each participating institution of the BQC19 is committed to collect a minimum set of data and samples, as described in section 5.

In the minimal sample set, a fraction of the collected samples will be labeled for the « local biobank » by the centres responsible of collecting for the BQC19.

- For the nucleic acids extracted from blood (DNA and RNA), the distribution between the BQC19 and the local biobanks is 80%:20%;
- For plasma and serum, it is 70%:30%;

- For PBMCs, it is 50%:50%. ⁽¹⁾

The first tube of plasma or PBMC (*Peripheral blood mononuclear cells*) will always be prioritized for the local biobank, and the second tube will always be for the BQC19.

The institutions are authorized/encouraged to collect beyond the minimal set, in order to respond to the local projects. These collections are also referred to as « local biobanks ». Their Management Framework is, to date, integrated with that of the BQC19, in the absence of other frameworks. Local researchers will be encouraged to share the results of their analyzes and experimental data obtained from their local samples with other researchers at BQC19, via the data sharing modalities detailed in section 6. For more details on data sharing, see Annex 9.

⁽¹⁾ For the pediatric PBMC, see Appendix 2.

3. MANAGEMENT OF THE BQC19

The Steering Committee is responsible for the administration of the BQC19. It reports to the BQC19 Governing Committee, initially chaired by representatives of the granting agencies. A new Chair, duly nominated by a nomination sub-committee of the Governing Committee and elected by the latter at its meeting on January 27, 2021, has been appointed on that date. The Governing Committee is composed of leaders of the participating institutions and other experts, in particular experts in legal matters and in patient-partner relationships.

The BQC19 Access Committee is responsible for authorizing access to the biological material and associated data for studies involving more than one site. Access to the data and material of one site is made through the local Access Committee or through the BQC19 Access Committee if desired by the local institution. The composition and operation of these committees is detailed in sections 8 and 9 of this Management Framework.

4. FUNDING

The BQC19 is funded by the FRQS, the *Ministère de la Santé et des Services Sociaux (MSSS)*, GQ and the Public Health Agency of Canada (PHAC).

5. RECRUITMENT

5.1 RECRUITED POPULATION

5.1.1 INCLUSION AND EXCLUSION CRITERIA

- Initial inclusion:
 - Patients who were tested for COVID-19 at one of the participating institutions of the BQC19;
 - Adults capable of consent to research;
 - Adults rendered incapable of consent to research due to COVID-19 (sudden and temporary incapacity);
 - Adults incapable of consent to research due to a condition other than COVID-19, if represented by an agent, guardian or curator;
 - Children under the criteria outlined in Dr Sze Man Tse's study « Biobank of samples and data for pediatric respiratory disease research » (Appendix 2);
 - A targeted percentage of 50% of the BQC19 participants will have tested negative for COVID-19.

Due to the evolution of the pandemic in Quebec, the ongoing vaccination and the population already recruited in the BQC19 cohorts, the inclusion criteria for participant recruitment were modified and approved by the Steering Committee on March 25, 2021 (participants with severe illness) and April 1, 2021 (participants with mild illness or asymptomatic).

Inclusion criteria may be re-evaluated due to future changes in the pandemic situation in Quebec.

5.1.2 PLACE OF RECRUITMENT

Participants will be recruited from the institutions participating in the BQC19 (Section 2.0).

5.1.3 IDENTIFICATION OF POTENTIAL PARTICIPANTS

The Lead Researcher for the BQC19 at each participating institution shall ensure that potential participants to the BQC19 are identified for recruitment in accordance with this Management Framework and the applicable laws and regulations at their institution.

The approval of the institutional Director of professional services is required when the identification of potential participants is achieved through medical records.

In certain institutions, the attending physician may be involved in the identification of potential participants.

Recruitment of participants may be achieved using the following methods:

- Posting advertisements at participating institutions
- Disseminating these advertisements on the websites of the BQC19, participating institutions, and in selected targeted social medias.
- By calling or sending text messages directly to potential participants.

Individuals interested in participating in the BQC19 will contact the research teams. The advertising poster was requested and approved by the CIUSSS-SLSJ. This advertisement was approved by the BQC19 Communications subcommittee and by the CHUM Research Ethics Board as the REB reviewer for the HSSN institutions. This advertisement may be used by all participating institutions and is available upon request.

The system used to send text messages to potential participants was prepared upon request by the BQC19 team at the Jewish General Hospital. This text-message system has been approved by the communications subcommittee of the BQC19 and by the CHUM ethics committee acting as REB evaluator for the institutions of the RSSS. The text-message system can be used by all establishments upon request - see appendix 4A for further details.

5.2. OBTAINING CONSENT

5.2.1 WHO MAY CONSENT

- A competent adult may consent to his/her participation in the BQC19 for him/herself;
- The consent of an incapacitated adult shall be given by a representative legally authorized to consent to the care required by their state of health;
- The consent of a minor is outlined in Dr Sze Man Tse's study « Biobank of samples and data for pediatric respiratory disease research » (Appendix 2).

5.2.2 RECRUITMENT AND CONSENTMENT PROCESS

Given the high risk of infection of the COVID 19 clinical and research staff, and the unique clinical context of each participating institution, acquiring and documenting consent will be modulated with respect to the usual standards that normally require a face to face meeting and obtaining a written consent using an Informed Consent form (ICF). In addition, the consent process should be adaptable, taking into account the patient's state of health. Given the fact that there were potential participants identified by the research teams who could not be approached during their visit to the emergency room and/or over the course of their hospitalisation, some people could be offered participation to the BQC19 after they are discharged from hospital, including those who were never admitted.

Each institution shall establish its unique consent process and reflect it in the Manuals of Operating Procedures (MOP) (Appendix 3). The MOPs should specifically address the following points: 1) The time and place where the patient is approached; 2) the procedure to follow when a patient is diagnosed as SARS-CoV-2 positive or SARS-CoV-2 negative; 3) the timetable and the nature of sampling (including the data) depending on whether the patient is diagnosed as SARS-CoV-2 positive or SARS-CoV-2 negative; 4) the time period over which the recruitment will be conducted. Appendix 3 provides the detailed description of the above-mentioned points per institution, in addition to the overall procedure according to local specifics, taking into account the procedures and regulations in effect. In order to ensure consistency across the BQC19 and harmonization of existing procedures, any consent process established by a participating institution of the BQC19, must respect the following two principles:

1. The autonomy of the participants (taking into account their state of health) must be respected at all times.
2. Recruitment into the BQC19 must be achieved safely for all involved participants.

More specifically, if the participant is capable to consent to the BQC19 and their state of health, according to the clinical staff, allows them to begin the consent process:

- The research staff verbally present (by telephone or other electronic tool available in the participant's room) the BQC19 and answer any question the participant may have.
- The research staff record and document the participant's verbal consent (electronic or other) in the ICF (electronic version);
- The research staff forward a copy of the ICF confirming the participant's consent to the participant via email or by regular mail;
- The participant reply to this exchange (electronically or by mail) including the text designated to the ICF in order to document the consent;
- If the participant dies before responding or if the research staff receive no response after a follow-up, the recorded and documented verbal consent is valid.

If the participant is incapable of consenting to the BQC19 or becomes incapacitated due to illness:

- The BQC19 lead research staff at the institution contact by phone the legal representative (mandatory, curator or guardian for the incapable adult and spouse, close parent or interested person in case of sudden incapacity) and present the BQC19;
- If the legal representative demonstrates an interest in the participation of the person represented, a copy of the ICF shall be sent to them by email;
- A phone conversation or videoconference shall be scheduled to answer questions from the legal representative, if any;
- Verbal consent is recorded and documented in the ICF (electronic version);
- A copy of the ICF certifying the consent is forwarded to the legal representative by email;

- The legal representative responds to the latter email with the text designated to the ICF in order to document the consent;
- If the participant dies before the legal representative responds or if the research staff receive no response after a follow-up, the recorded and documented verbal consent is valid.

If the participant regains his/her capacities (in case of sudden incapacity) and must confirm his participation in to the BQC19:

- Procedures for obtaining the consent of the capable participant to the BQC19 are followed.

If the participant is a minor:

- The process is outlined in Dr Sze Man Tse's study «Biobank of samples and data for pediatric respiratory disease research » (Appendix 2).

If the potential participant could not be contacted by the research team during their emergency room visit and / or hospitalization, or if the participant did not require a visit to the emergency room or a hospital admission:

- The research staff responsible for BQC19 at the institution will contact the potential participant either in person during a clinical visit and/or by phone and/or by sending a text message.
 - By telephone: The procedures for obtaining the consent from participants who are capable to consent to the BQC19 will be followed, as detailed above.
 - By sending a text message: The research staff responsible for the BQC19 will send a text message to the potential participant to offer them participation in BQC19. Messages will be sent from the "TELUS Business Connect" application, and will ask participants if they want to schedule an information session over the phone with a member of the BQC19 team. If so, potential participants will be able to make an appointment in the "Calendly" application, from the available time slots predetermined by the local BQC19 coordinator. At the scheduled time, the coordinator will contact the potential participant by telephone, and will continue the consent process following the procedures for obtaining consent from participants who are capable to consent to the BQC19. Please see Appendix 4A for additional details on the "TELUS Business Connect" and "Calendly" applications.
- After verbal consent has been obtained over the phone, the research staff responsible for BQC19 will obtain the participant's signature on the informed consent form at the time of their first visit, before beginning the data and sample collection procedures.

5.2.3 REINFECTED PARTICIPANTS

BQC19 is particularly interested in obtaining samples from participants reinfected with COVID-19. Participants already recruited in BQC19, who are readmitted to a BQC19 site for a COVID-19 infection, will be approached during their hospitalization to offer the opportunity to provide additional samples. These additional samples will follow the same sampling schedule (D0, D2, D7, D14, and D30) as that of newly recruited participants (details in section 5.3.1). Once the participant is discharged from the hospital for their re-infection, they will revert back to the follow-up schedule established when they first became infected with COVID-19. Participants can provide additional samples with each re-hospitalization for COVID-19.

To ensure that informed consent is obtained from reinfected participants, the local BQC19 team will administer the informed consent form to the participant at each COVID-19 rehospitalization. A participant re-infected with COVID-19 will always have the option of not contributing additional specimens upon rehospitalization, and this decision will not affect the follow-up timeline established during the participant's initial consent. The supplemental informed consent form will be kept with the participant's initial consent form in the BQC19 team's local research files.

Reinfections without the need for hospitalization will be noted during follow-up, but will not generate a change in follow-up or require re-consent.

5.3 COLLECTED MATERIAL AND DATA

Biological material shall be collected by the clinical staff, or any other person according to institutions guidelines in effect, as part as the participant's standard care.

All collected biological material shall be processed at one of the participating institutions of the BQC19 in accordance with the institution's Standard operating procedures in order to ensure optimal storage. These procedures also entail that the required clinical data are electronically linked to the samples in the RedCAP data management application and that the management and inventory is kept updated in BTRSR (electronic database for the Biobank of the Respiratory Health Network of the FRQS)

Each participating institution of the BQC19 will have its own MOP to ensure that the collection process and tracking of the biological Material are in accordance with local realities. In order to facilitate and promote cohesion within the BQC19, a common core document is provided. These MOPs are appended to this Management Framework and are available to other BQC19 member institutions (Appendix 3, specific to each institution).

5.3.1 BIOLOGICAL MATERIAL

Hospitalized adult participants who underwent a PCR test for SARS-CoV-2 with either a positive or negative result, and met the inclusion criteria at the time of recruitment:

- One to five additional blood samples, 48 ml each, up to a maximum of 240 ml, will be drawn when sampling is required as part of the participant's standard care. No blood samples will be drawn solely for the BQC19 during hospitalization on D0, D2, and D7. However, samples may be drawn exclusively for the BQC19 even if not clinically indicated on D14 and/or D30.
- Blood samples should ideally be collected five times (during hospitalization):
 - Recruitment Day (D0)
 - On day 2 (D2)
 - On day 7 (D7)
 - On day 14 (D14)
 - On day 30 (D30)

Participants who underwent a PCR for SARS-CoV-2 during their hospitalization but were discharged from hospital:

- During medical follow-up visits associated with the SARS-CoV-2 and for up to two years, 60 ml of additional blood will be drawn at each scheduled visit on approximately Day 30 (M01), 90 (M03), 180 (M06), 365 (M12), 545 (M18) and 760 (M24) following hospital discharge (in an outpatient clinic or at home). Blood will be collected at a maximum of 200 ml per month and it will not necessarily be collected as part of the participant's standard care.

Participants who underwent a PCR for SARS-CoV-2 and have not been hospitalized:

- During medical follow-up visits associated with the SARS-CoV-2 and for up to two years, 60 ml of additional blood will be drawn at each scheduled visit on approximately Day 30, 90, 180, 365, 545 and 760 following original diagnosis (in an outpatient clinic or at home). Blood will be collected at a maximum of 200 ml per month and it will not necessarily be collected as part of the participant's standard care.

Minor participants with a positive or negative diagnosis of SARS-CoV-2:

- Samples collection is processed as outlined in Dr Sze Man Tse's study « Biobank of samples and data for research in pediatric respiratory disease » (Appendix 2).

Pregnant adult participants with a positive or negative diagnosis of SARS-CoV-2:

- The following additional samples will be processed to be stored and used for research purposes:
 - Vaginal swabs (two swabs) on admission and delivery (if the period between admission and delivery exceeds 7 days), with the possibility of self-sampling.
 - Collection of amniotic fluid (10 ml) in case of caesarean delivery (C-section).
 - Collection of cord blood (25 ml).
 - Collection of breast milk (maximum 5 ml): within 24 hours and between 24 and 48 hours after delivery, then once a week if mother or child is hospitalized or seen in an outpatient clinic.
- Any remaining portion of post-natal biological Material related to pregnancy (in particular placenta samples) will be sent to the biobank.

In order to ensure the integrity of the BQC19, the date and time of any sampling will be documented.

5.3.2 BIOLOGICAL MATERIAL AND DATA ALREADY COLLECTED

Additional biological material collected as part of any COVID-19 research that would otherwise be destroyed may be stored in the biobank if deemed relevant by the Lead Researcher at the participating institution where they were collected.

In addition, the BQC19 is developing strategic partnerships with the population database CARTaGENE and the Canadian Longitudinal Study on Aging (CLSA) in order to enhance epidemiological studies on COVID-19 at a population level. The process of importing these data will be done within a framework that minimizes the risk of re-identification. To that end, some variables may not be imported if the importation will compromise this fundamental principle. The ELSI sub-committee (ethical, legal and social implications) of the BQC19 will ensure compliance with this principle.

5.3.3 DERIVATIVES OF BIOLOGICAL MATERIAL

DNA, RNA, proteins, lipids, metabolites and primary cells may be isolated from the BQC19 biological material. In order to support its objectives and those of the researchers seeking access to biological Material, the BQC19 and the HSSN banks may develop cell lines, organoid, xenografts, as well as genetic analyses related to COVID-19 or any other relevant research process.

5.3.4 CLINICAL DATA

Clinical data relevant to research on COVID-19 will be stored in the BQC19. This includes pertinent medical information of the participant, including medical records, X-rays and imaging. For the final medical tests, it will be noted if the test was completed but the test result will not be recorded. The physical evaluation of the participant, as well as his/her general state of health are recorded in the Case Report Form/CRF approved by the Steering Committee.

Participant's consent to the BQC19 is obtained for the following reasons:

- 1- Allow to collect and use the information, in their medical record at the hospital, pertinent to the BQC19 objectives.
- 2- Allow access to data from the *Institut de la statistique du Québec*, to access, among other things, the database for death records and the database of the Quebec provincial health insurance program (Régie de l'Assurance-Maladie du Québec).
- 3- Allow access to data from the *Laboratoire de Santé Publique du Québec (LSPQ)*, to access, among other things, the data on the isolated and tested virus from BQC19 participants.

5.3.5 RESEARCH DATA GENERATED FROM BQC19 RESOURCES

The BQC19 recognizes the importance of developing its database. Researchers accessing BQC19 samples and data must provide a copy of their derived data to the BQC19, in accordance to the Transfer Agreement in force. The data to be returned to the BQC19 are the raw data from experimental analyses performed on the biological material as well as any new clinical data or variables acquired during the course of the project, which are not already included in the BQC19 data. However, this excludes the results of analyses that were performed on the data provided by the BQC19. In all cases, a copy of the manuscripts using the biological material or data from the BQC19 will be sent to the BQC19 upon approval. These derived data are an integral part of the BQC19 research data, and will be available to other researchers who may, in the future, have access to this enhanced data.

6. STORAGE OF BIOLOGICAL MATERIAL AND DATA

6.1 DATA STORAGE METHODS

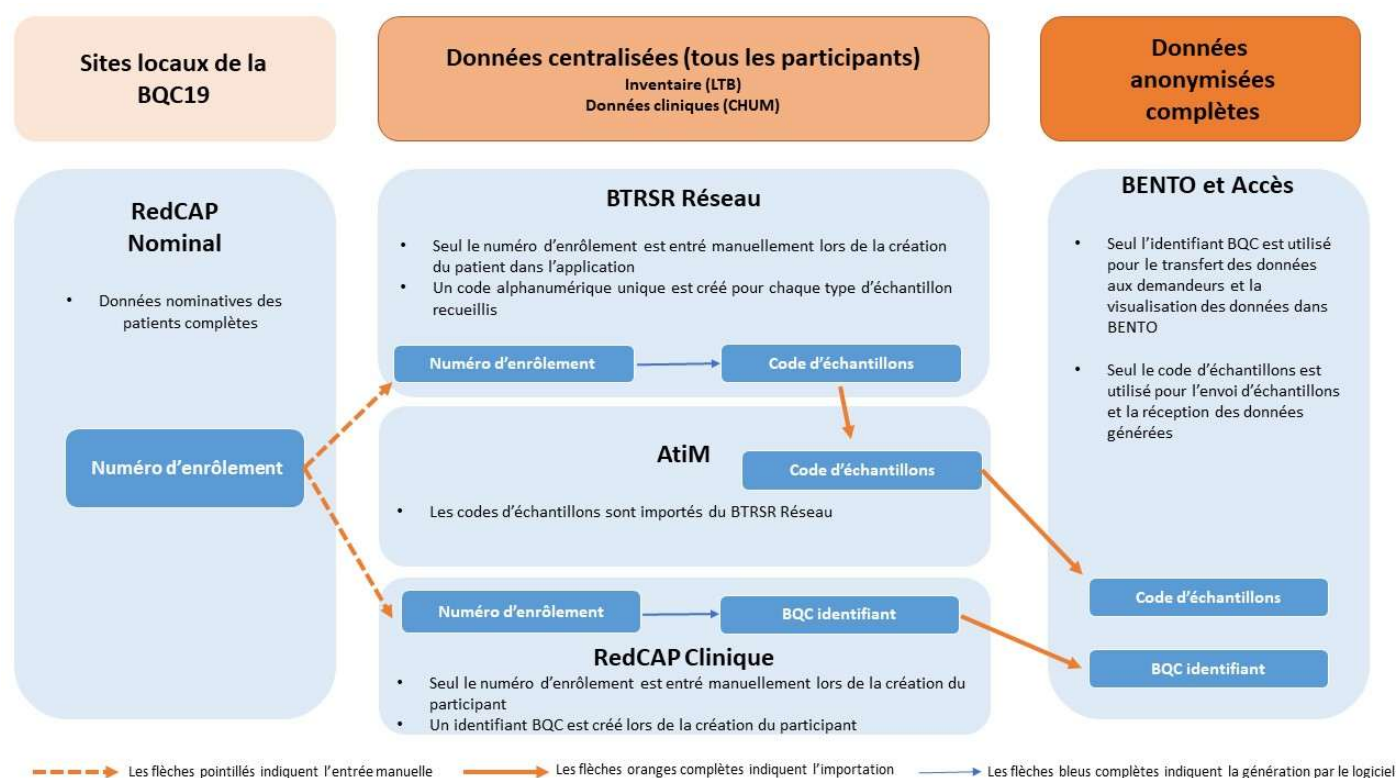
6.1.1 HOSTING STRUCTURE OF THE DATA & DATABASES

The BQC19 processes data from participating institutions. There is data relating to the inventory of conserved biological samples, as well as participant clinical data. Data processing occurs at several levels. The first level starts at each institution and includes participants' identifiable data. The local BTRSR application is used to collate this data by attributing to the participant an **enrollment number**. The second level consists of collecting networked data. At this level, each patient is assigned a unique code, named the **BQC identifier**. The data relating to the inventory of biological samples are managed by the BTRSR network database located at the *Collaboration en Recherche pour l'Efficacité en Diagnostic (CRED)* at the Research Centre Étienne Lebel of the *CIUSSS de l'Estrie (Centre Hospitalier Universitaire de Sherbrooke (CHUS))* (see section 6.2.). Once the data is compiled, via entry into RedCAP, de-identified and processed for quality, clinical data will be transferred to a secured and centralized processing system, utilising the Bento platform on the cloud-based server SecureData4Health, managed by Guillaume Bourque (McGill Genome Center) and his team. This is where all data from the BQC19 are stored (including data from the processing of collected samples), and represents the starting point from which data is shared to other research teams affiliated with the BQC19. The linkage between the clinical data and the BQC19 sample data is achieved through the **BQC identifier** and the **sample code** (the number that is attributed to each biological sample collected). Data extraction and secure data transfer required to share data with third parties will be done utilising the secure file-sharing technology named Globus, which is connected to a 500TB storage space in the cloud-based SecureData4Health servers.

Updated 2024-10-01: As of 2024-10-01, the BTRSR software is no longer supported. In order to preserve the nominal information of the participants required to recontact participants, and not to put the security of the nominative data of the participants at stake, the BQC19 set up the RedCAP Nominal database. Patient names & contact info will be kept in a version of RedCAP that is separate and independent from the RedCAP containing the clinical data of the BQC19. The migration of nominal data into RedCAP Nominal will be carried out by the team of local BQC19 coordinators, and the CITADEL team. The nominal RedCAP database for each site will be located at the CHUM, under the supervision of CITADEL. The hierarchy of access permissions granted to RedCAP users and CITADEL's security and confidentiality measures are detailed in section 6.2.

Table 1 – Name and function of the different identifiers utilised in the BQC19		
Identifieur	Format	Function
Enrollment number	Numeric	Number attributed to the participant at enrollment which is linked to their nominal information (local level)
BQC identifier	Alphanumeric BQC00000	Unique participant identifier used to link data between the different databases
Sample code	Alphanumeric ABC00000-00	Unique non-repeating sample identifier which is attributed to each biological sample collected on a given participant visit

Figure 1 – Database architecture and detail on utilization of each different identifier



Local BTRSR: Each site acts as the custodian of the identifiable nominal information of the BQC19 participants. Identifiable information is any data that can provide information to track the participant directly or indirectly.

Nominal information are not shared with the BQC19, except in the specific cases where these data are used to access to, and make the requisition of, data held in provincial health institutions for participants who provide consent to share their data. The data held by the Institut de la Statistique de Québec (ISQ - including medico-administrative data from the RAMQ, data from MED-ECHO and mortality data), and the Laboratoire de santé publique du Québec (LSPQ). The procedure in Appendix 5A : *Modalities of transfer of nominal information to institutions external to the BQC19* will be

used to transfer the list of participant identifiers to institutions external to the BQC19 in a secure and confidential manner.

Updated 2024-10-01: Due to the closure of the local BTRSR, nominal data will be imported into the RedCAP Nominal database, located at the CHUM under the supervision of CITADEL. Participant contact information (including last name, first name, telephone number, email) will be imported into a RedCAP database specific to their site. Access to RedCAP Nominal will be restricted to the CITADEL team, and the site coordination team to protect the confidentiality of participants at each site. Each site only has access to its own site's RedCAP Nominal database.

The local BTRSR is also the application used to attribute the enrollment numbers to patients at each site. Only these enrollment numbers are able to be linked to the nominal information. (Details of the BTRSR application are in Appendix 5). *Please note that recruitment of new BQC19 participants is complete, and all follow-up visits have been completed. Therefore, the sample code assignment functionality of the Network BTRSR is no longer required.*

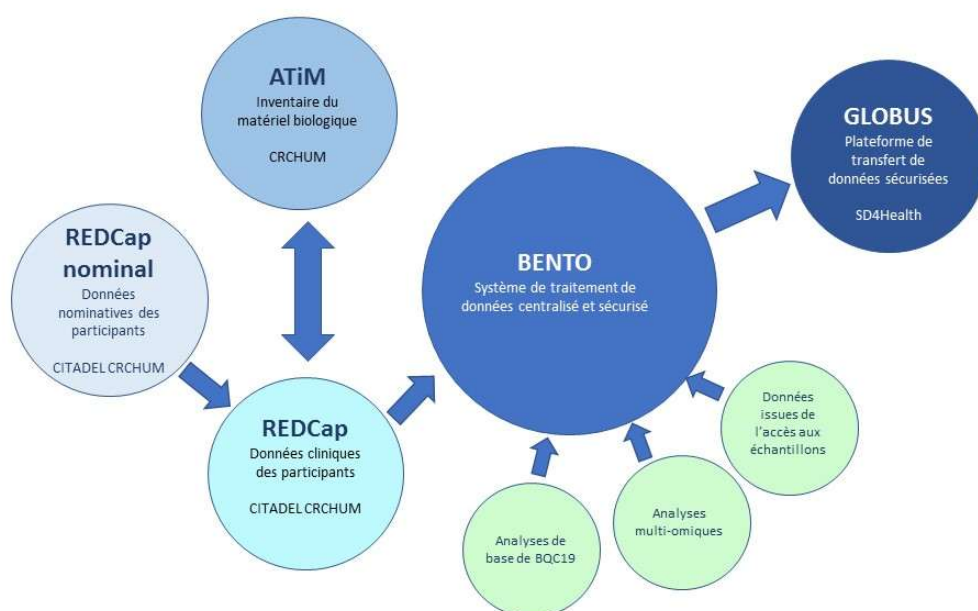
Network BTRSR: When creating the participant in the Network BTRSR database, the enrollment number (attributed by the local BTRSR application) is entered manually. The network BTRSR generates the non-repeating sample codes for every sample obtained. This sample code links each of the different types of sample (plasma, whole blood, PBMC...) to the site, and to the participant, as well as to the participant's particular visit. Information on biological material (location, quantity, availability, etc.) is also stored on the network of the BTRSR database. Depending on the type of banked samples, the information collected directly about the sample is of major importance as it defines the exact nature of the biological material and its storage method. Each site only has access to the biological samples collected at their site.

Updated 2024-10-01: Due to the closure of the Network BTRSR, the management of BQC19 samples will be carried out using AtiM, which is located at the CHUM under the supervision of CITADEL. The inventory of available BQC19 samples will be imported into AtiM by the BQC19 coordinator. Appropriate access will be granted to laboratory managers at each site, as well as local coordinators, in order to facilitate the import of sample codes, the update of the inventory following sample requests, and the management of the BQC19 sample inventory. No nominal data will be imported into AtiM.

RedCAP: Upon creation of the participant in RedCAP, the participant's enrollment number (attributed by the local BTRSR application) is manually entered. RedCAP generates the BQC identifier, which will serve as the unique identifier used to identify each individual participant in the database. The sample codes generated by the network BTRSR will be imported into RedCAP in order to be associated with the corresponding BQC identifier. The BQC identifier will be the identifier that will be shared with data extracts. Consequently, the possibility of obtaining nominal information about a participant by solely consulting the shared data on Bento is improbable. Participant clinical information (comorbidities, COVID-19 severity, clinical lab results, etc.) will be entered into RedCAP by the local study teams.

Bento : The BQC identifiers and the sample codes will be transmitted via RedCAP to Bento. Bento is the depot of the entirety of the database of non-nominal BQC19 data. All analyses results on biological material whether from the core analyses of the BQC19 (including genetic data) or from external partners will be transferred directly to the Bento centralized data processing system, on the cloud-based SecureData4Health servers ~~Beluga server of Calcul Québec~~, in a coded form. It is from this database that data will be shared with collaborating researchers, and sharing of the database with these researchers will be done via GLOBUS.

Figure 2: Database architecture and the content of each different database



6.1.2 TRAJECTORY OF BIOLOGICAL MATERIAL AND DATA

See Appendix 1 for the details at each participating site.

6.2 ELECTRONIC DATABASE SAFETY MEASURES

6.2.1 USER LEVELS, ACCESS CONTROL, USERS OF THE DATABASES

Only the local section of the BTRSR includes participant's personal and nominal data. These data are only accessible by the local site that houses them, via their institution's servers. No nominal data is included neither in the network BTRSR nor in RedCAP, but certain personal information (sex, date of birth) are included. Therefore, their use is reserved to persons who have received (with the authorization of the BQC19 Director or his delegate) a personal user ID and password.

In order to meet administrative, usage and consultation needs of AtiM, five levels of users have been created:

1. Super administrator :
 - a. Has all rights (creation of subject (participant with a unique identifier code, or visits leading to the storage of samples and/or data for a participant));
 - b. Has rights to manage users for all participating institutions;
 - c. Has rights to manage the lists of variables;
 - d. Has rights to access information of participants and visits of his/her institution only.
2. Institutional administrator :
 - a. Has all rights (creation of subjects and visits) ;
 - b. Has rights to manage users for his/her institution.

3. User:
 - a. Has same rights as the institutional administrator except for user management.
4. Restricted User:
 - a. Has same rights as a user but his rights are granted on a case-by-case basis;
5. Read only :
 - a. Has same rights as a user but they are not entitled to create subjects, nor visits, and are not able to save and backup data;
 - b. May have rights to statistical apps (by institution only) and to generate reports on a case-by-case basis.

To meet the administrative, usage and consultation needs of REDCap, six user levels have been planned:

1) System administrator

- a. Has access to the highest level privileges (project design and setup, user rights, Data Access Groups)
- b. Has access to all participants and visits for all BQC19 sites
- c. Has access to data exports (full data set)
- d. Has permission to create, rename and destroy recordings (all sites)
- e. Has access to the creation, editing and organization of reports and “Stats & Charts”
- f. Has access to the following tools: calendar, data import, data comparison, file repository, logging, Data Quality (create, edit and execute rules) and API.
- g. Has permission to lock / unlock data entries

2) Data analysis + API

- a) Has access to all participants and visits of their local site
- b) Has access to data export (with the removal of all labeled identifier fields)
- c) Has access to the following tools: calendar, data import, data comparison, file repository, logging, Data Quality (create, edit and execute rules) and API.
- d) Has access to the creation, editing and organization of reports and “Stats & Charts”

3) Data Entry

- a) Has access to the following tools: calendar, file repository
- b) Has access to the ability to create new data entries
- c) Has access to the visualization of the data entries of their local site

4) PI

- a) Has access to the export of de-identified data (De-identified means that all free text fields will be deleted, as well as date / time fields and identifier fields)
- b) Has access to the creation, editing and organization of reports and “Stats & Charts”
- c) Has access to the following tools: calendar, file repository

5) Project Manager

- a) Has access to data export (with the removal of all labeled identifier fields)
- b) Has access to the creation, editing and organization of reports and Stats & Charts
- c) Has access to tools: calendar, data import, data comparison, file repository, logging, Data Quality (create, edit and execute rules)
- d) Has permission to view, create and rename recordings (Project Manager JGH, may destroy recordings) of his site

6) Site coordinator

- a) Has access to data export (with the removal of all labeled identifier fields)
- b) Has access to report creation, editing and organization
- c) Has access to tools: calendar, data comparison, file repository, logging, Data Quality (execute rules)
- d) Has permission to view, create and rename recordings from their site

6.2.2 DATA SECURITY AND DURABILITY

Private database (local) - RedCAP Nominal

Periodic and automatic data backup is crucial to prevent data loss. Therefore, participant names and contact information will be imported into the RedCAP Nominal database. The security and protection of data contained in the private database are the sole responsibility of the Lead Researcher in an institution, and as such, he/she shall make arrangements with the IT department of his/her institution in order to ensure security. The RedCAP Nominal database servers are located in the server room of the CHUM or in the server room of the SS – Pavillon Mailloux (Notre Dame Hospital). Access to server rooms is restricted to managers of the Department of Information Technologies and Telecommunications (DTIT), and managers of CITADEL. Access is secured by user and unique password.

Shared database (Network BTRSR)

Mechanisms have been put in place to ensure the security of data from the BTRSR:

I- Site Security:

The LTB is located in an environment controlled by a card access system. The BQC19 server is installed under lock inside the Research Centre Étienne Lebel.

II- IT security:

Access to the server is password protected and restricted to LTB administrators. In addition to its own security system, the server also benefits from a firewall security system set up by the IT department at the CHUS.

III- Data security and availability:

The LTB ensures the integrity of the data collected. The server that hosts the BQC19 data has an auxiliary power supply in case of power failure and is available 24 hours a day, every day of the year. The data is backed up to a hard drive and the server operating system simultaneously maintains a block-level striping with distributed parity (RAID level 5). A full backup copy of the data is retrieved daily according to a two-week schedule. A weekly backup of the data is also carried out and placed in a secure location to counter the effects of a major disaster.

RedCAP database security measures (under the supervision of the CITADEL group):

REDCap BQC19 data is stored on servers dedicated to CITADEL and protected within the CHUM's data security infrastructure. They are subject to the same security standards as the CHUM's patient data. Only those responsible for the organization and maintenance of servers dedicated to CITADEL with badge authentication can access the secure server area. The servers dedicated to CITADEL consist of a series of hardware servers on which are installed a network of virtual nodes used to extract, process, redistribute, integrate, store and analyze CHUM data, and this all in storage spaces contained within the CHUM infrastructure.

An access management process has been put in place to ensure the traceability and control of access to CITADEL data. Only the main users holding the privilege can access the CITADEL servers. Secondary users can access subsets of analysis

data, ie. the REDCap BQC19 data here at the CHUM, which is stored separately from other CITADEL data, via dedicated virtual machines created for this purpose.

AtiM database security measures (under the supervision of the CITADEL group):

As of October 1st, 2024, sample inventory management will be done using AtiM. AtiM is headquartered at the CHUM under the supervision of CITADEL. All security requirements that are put in place by CITADEL also apply to the AtiM database.

Bento database security measures (in collaboration with SecureData4Health):

The BQC19 clinical data will be stored in the Bento database, which is hosted on the SecureData4Health servers. Some experiment result files will also be stored on SecureData4Health equipment to make them accessible to users from the Bento Portal user interface. For more information on the various cloud-based servers managed by SecureData4Health, please visit: <https://www.sd4health.ca/about/>. User access to the data will strictly be done through the Bento web Portal. Access to the Bento Portal is provided with a Compute Canada account, which involves a user registration process (for more information: <https://www.computecanada.ca/research-portal/account-management/apply-for-an-account/>). It is password-protected, using the login information provided by Compute Canada & SecureData4Health.

6.2.3 DATA TRANSFER SECURITY

Data transfer of the BQC19 data will be done via GLOBUS from SecureData4Health. (For additional info visit: <https://globus.computecanada.ca/> and <https://docs.computecanada.ca/wiki/Globus>)

From the GLOBUS websites listed above: “***Globus** is a service for fast, reliable, secure transfer of files. Designed specifically for researchers, Globus has an easy-to-use interface with background monitoring features that automate the management of file transfers between any two resources, whether they are at Compute Canada, another supercomputing facility, a campus cluster, lab server, desktop or laptop.*

Globus leverages GridFTP for its transfer protocol but shields the end user from complex and time consuming tasks related to GridFTP and other aspects of data movement. It improves transfer performance over GridFTP, rsync, scp, and sftp, by automatically tuning transfer settings, restarting interrupted transfers, and checking file integrity.”

Collaborating researchers making data requests will only have access to the data files they have requested and for whom their data access request was accepted by the BQC19 data access committee. This access is provided by the Data Management working group in collaboration with the BQC19 data access committee by the intermediary of the data access officer.

6.2.4 UPDATES

The BTRSR, RedCAP and Bento applications all undergo regular updates. These updates are to address a new function addition, settings modifications or application correction. During an update, once a test is performed to ensure that the update is working properly, it is applied to the official version.

Updates rarely affect the normal operation of the BQC19. Otherwise, a message will be sent to users beforehand indicating that there will be an interruption of service, including the reason and the duration of this interruption.

6.2.5 TRAINING

Any person entering data into the BTRSR, RedCAP or Bento must be trained beforehand by the BQC19 Coordinator or a member of the BQC19 team.

6.3 PHYSICAL SECURITY MEASURES

In accordance with the policies in force at each participating institution that govern the occupational health and safety components, physical security measures shall be implemented to ensure the security of staff as well as the biological Material and data for which the BQC19 is the custodian.

Physical access of the BQC19 sites at the participating institutions must be controlled on both sides, the biological Material and the BQC19 records. The same applies to the electronic data. Only those authorized by the BQC19 Lead Researcher at each participant institution must have access to biological Material and BQC19 records.

6.3.1 SECURITY MEASURES FOR STAFF

Anyone handling BQC19 biological Material must ensure that it is handled safely and optimally while eliminating loss and contamination risk. Internal policies at each participating institution must be followed with respect to the management of biological Material and to the procedures regarding internal transfer for samples and specimens.

Each of the participating institution is subject to internal policies for handling infectious and hazardous Material. Staff who will handle human samples shall complete laboratory biosafety training at a containment level 2 or 3 depending on the types of the processed biological samples.

6.3.2 SECURITY MEASURES FOR THE BQC19 BIOLOGICAL MATERIAL AND DATA

Biological samples shall be kept in places where access is restricted to authorized persons. A mechanism to control access at the secured premises shall be introduced and documented. It is recommended that the control mechanism is based on a card access system that documents all card activities and use, if possible. Paper documents must be stored in secured locations and physical access to the BQC19 records must be controlled by the use of locked filing cabinets.

Biological Material must be centrally stored within each participating institution. This consolidation of biological Material enables a better quality and inventory control. Samples are stored according to the type of storage required: room temperature, frozen in -20 °C or -80 °C freezers, or stored in liquid nitrogen.

Freezers and refrigerators must be connected to red emergency sockets, i.e., a generator is activated within a short period of time allowing ideal temperature maintenance for adequate storage of biological samples. They are to be located in a room with appropriate air conditioning system. An emergency freezer must also be available if necessary. In the event of power outage or a technical problem, the internal temperature of a -80 °C freezer begins to drop and takes approximately 4 hours to reach a critical temperature of -65 °C. The level of liquid nitrogen in the tanks in which the samples are stored must be checked twice a week.

6.4 PRIVACY AND CONFIDENTIALITY

The minimum precautions taken by various BQC19 participating institutions to protect confidentiality are as follows:

- Coding;
- Data under lock;
- Appointment of a BQC19 Lead Coordinator at each participating institution.

Furthermore, data stored on the network BTRSR, AtiM, RedCAP or Bento do not contain any information that can be traced to the participant. The only potential identifying element is the unique code associated to each participant, the BQC identifier. Identifiable information are stored solely in the RedCAP Nominal created for each site (see section 6.1 for details, updated 2024-10-01).

As above-mentioned, the protection of privacy and confidentiality is a core value of the BQC19. This must manifest in practical measures. For example, given the dynamic nature of the tools for dataset analysis, the ELSI sub-committee (ethical, legal and social implications) and the Clinical data sub-committee shall be responsible for periodically evaluating the nature of the risk of re-identification with respect to these tools in order to take all necessary measures to minimize this risk.

6.5 SHELF LIFE

BQC19 biological material and data will be retained as long as their scientific interest and applicable ethical rules warrant.

6.6 RIGHT OF WITHDRAWAL

BQC19 participants have the right to withdraw their consent verbally or in writing, without explanation and without consequences on the quality of care and services they are entitled to receive. The informed consent form details the BQC19 participant withdrawal process, indicating that *"If you decide to withdraw from the BQC19, your samples and data will be destroyed as of the time of your notification, unless they are the subject of completed or ongoing studies. In these cases, they will not be destroyed in order to ensure the scientific integrity of those studies."* BQC19 agrees to no longer contact these participants, to no longer use and to destroy their biological material and data, as well as any associated identifiers, if possible. When a participant indicates their desire to withdraw from the BQC19, they are presented with the following four choices regarding the type of withdrawal they prefer:

- a) Complete withdrawal (no telephone follow-up, no follow-up blood sampling)
- b) Removal of the blood sampling component (but continuation of telephone follow-up)
- c) Removal of the telephone follow-up component (but continuation of blood samples)
- d) No withdrawal (the participant wishes to continue participating in the study)

If the participant has chosen to withdraw from the study (option a, b or c above), the participant is also asked for their preference in relation to the storage and use of clinical data and / or biological samples, by choosing one of the following three answers to the question "Can we keep the data already collected?":

- i) "No, I would prefer that the biological samples I have provided are destroyed and that the clinical data collected is deleted from the BQC database."
- ii) "You can keep the clinical data that was collected, but I want you to destroy the biological samples that I have provided."
- iii) "You can keep the biological samples I have provided, but I want you to delete my clinical data from the BQC database."

The consent withdrawal procedure is initiated as soon as the participant requests it, according to the stated wishes of the participant. The consent withdrawal process includes the physical destruction of any biological material collected as well as the deletion of any data associated with the inventory of samples the participant has provided.

Steps of withdrawal:

- a. Verification of the identity of the applicant participant.
- b. Verification of the availability of the biological material:
 - If the biological material is available for use, proceed to step c;
 - If the biological material has been partially distributed, proceed to step c. for the portion still unused by the BQC19;
 - If the biological material has been distributed, inform the participant of the date the data were destroyed and that the destruction of the material must be completed by the end of the study for which the biological material was shared. A letter will be sent to the User-Researcher advising him/her of the date of destruction of the data relating to the sample in question. The User-Researcher will thus have the opportunity to obtain the information relevant to his research prior to that date.
- c. An information letter from the BQC19 Coordinator at the institution involved in the withdrawal request (Appendix 6) stating the facts is sent to:
 - The Director of the BQC19;
 - The Coordinator of the BQC19;
 - The Lead Researcher of the BQC19 at the involved institution;
 - The Director of the LTB;
 - The IT Coordinator of the LTB.
- d. Physical destruction of samples, computer data and paper documents are to be completed in accordance with the procedures in force at the involved participating institution.
- e. Certificates of destruction are issued by the BQC19 Coordinator at the involved institution and by the IT Coordinator of the LTB (Appendix 7). These certificates shall be kept locally at the involved institution.
- f. A copy of the information letter and a copy of the Certificates of Destruction are sent to the participant. The withdrawal is reported to the Research Ethics Board at the annual renewal.

The reference to this withdrawal is automatically included in the annual report prepared by the site.

Destruction of clinical data

The procedure for withdrawing clinical data starts with the coordinator of the BQC19 of the participating site informing the coordinator of the BQC19 of the withdrawal of the participant's consent. Once the information is received, the BQC19 coordinator destroys the clinical data associated with this participant in the REDCap electronic CRF. Once the destruction is finalized, the BQC19 coordinator will issue a destruction certificate that will be returned to the site and keep a copy in its files.

Destruction of experimental data

The procedure for withdrawing experimental data requires the coordinator of the BQC19 to notify Dr. Guillaume Bourque's team of the participant's withdrawal of consent. The coordinator will provide the BQC identifier of the participant as well as all the other participant identifiers & codes associated with that participant. The team will destroy the experimental data corresponding to the codes provided. Once the destruction is finalized, Guillaume Bourque's team will notify the BQC19 coordinator and a certificate of destruction will be issued and provided to the site. An update of the available data (clinical and experimental) will be made and this new version will be shared with collaborating researchers & the scientific community.

6.7 RECONTACTING PARTICIPANTS

Participants who have consented may be recontacted by the BQC19 Lead Researcher at the institution where they were recruited.

6.8 ACCESS TO BQC19 FOR AUDIT PURPOSES

For the purposes of surveillance and control, protection and security, the records of BQC19 participants as well as their medical records may be accessed by a person mandated by regulatory bodies, in Canada or abroad, such as Health Canada, and representatives of the institution or the Research Ethics Board. These individuals and organizations adhere to a privacy policy. No photocopies or copies of BQC19 documents may be made during audits.

Participants have the right to consult their research records to verify the information collected, and to have them corrected if necessary.

6.9 RETURN OF RESULTS TO PARTICIPANTS

When the research results in validated scientific outcomes, the latter will be available to participants via the scientific publications.

Information resulting from research on BQC19 samples is used only for scientific purposes. This information shall not be entered in the participant's medical record or communicated to the participant or to unauthorized third parties.

BQC19 participants will have the opportunity to view the list of projects using biobank data and biological Material, including a summary of the project in lay language on the BQC19 website.

6.10 INCIDENTAL FINDINGS

For adult participants, incidental research findings shall not be shared with the participant nor their physician, as they will not be of clinical quality. As a result, they cannot be used for clinical decision-making. If this reality changes, the Management Framework as well as the consent shall be amended accordingly. For pediatric participants, the required procedures are as outlined in Dr Sze Man Tse's study « Biobank of samples and data for research in pediatric respiratory disease » (Appendix 2 - (Appendix 2 – approved documents of the CHU Sainte-Justine).

7. CORE ANALYSES

In order to provide a timely response to the pandemic, while optimizing the use of samples collected by the BQC19 that are particularly valuable and unique, to ensure return on investment and in response to:

- The development of the global pandemic;
- The changes in patient management; and
- The announcement related to the COVID-19 vaccine development.

The BQC19 Governing Committee has approved on November 18, 2020 that a series of core analyses may be performed on these samples, the results of which will be provided to the scientific community as soon as possible.

These core analyses are summarized in the table below.

Type of Analysis	Objective
Whole Genome Sequencing and Genotyping (GWAS) of the host genome	Identification of all genetic variants of the host genome as well as genetic variations such as changes in the number of copies of certain genes (whole-genome sequencing) as well as common genetic variations across the genome (genotyping GWAS) associated with COVID-19. These results will enable studies on susceptibility and response to the disease and the risks of developing a severe form of the disease.
Virus Genome Sequencing	Provide a better understanding of the infection trajectory and the different identified strains of the virus. These data along with the whole-genome sequencing may also be correlated with the severity of the disease and the immune response.
Proteomics (1) SomaScan	The simultaneous measurement of 5000 proteins in the collected samples will make more data available to predict the risk of the disease progression in several areas, i.e. cardiovascular. This technology was chosen because of the large number of proteins measured in a single sample.
Proteomics (2) Immuno-inflammatory markers	This approach, which is complementary to the SomaScan above, will measure identified immuno-inflammatory markers using a very specific and sensitive technique. These data will provide a better understanding of this important aspect of patients' response to the disease and possibly guide future treatments.
Basic laboratory test for non-hospitalized patients	Enable basic blood tests and provide important data for research on participants in both cohorts. This includes basic values for liver, cardiac and renal damages, as well as standard inflammatory parameters.
Metabolomics	Enable measurement of metabolites in COVID-19 which may lead to research on the identification of individuals that are likely to develop a severe disease and on the understanding of the molecular pathways that may explain this susceptibility as well as the spectrum of severity and diversity of clinical manifestations.
Immunoserology (1)	Enable a very detailed and quantitative measurement of specific antibodies against SARS-COV-2 virus in the infected patients, well beyond the standard serological tests, as well as the ability of these antibodies to neutralize the virus. This will guide research on patients' immune response to the COVID-19, a key element in the disease management.
Immunoserology (2)	The Laboratoire national de microbiologie (LMN) will perform seroneutralisation assays on samples of plasma. These tests will qualify the titer of neutralizing antibodies in 2000 BQC19 samples by measuring the number host cell plaques after the addition of a viral suspension to the plasma samples. These data will provide important information on the immune response of BQC19 participants infected with COVID-19.
Transcriptomics	Transcriptomics signatures have been associated in other viral diseases, with cellular and immune response, disease pathogenesis, and infection trajectory beyond the initial phase. Transcriptomics analyses performed on the participants' RNA will generate important data in this area in the case of COVID-19

While optimizing the use of samples, this systematic approach should rapidly contribute to the generation of data to identify molecular signatures for the stratification of the risk of severe disease and to develop a better understanding

of the pathogenesis of the disease and its long-term side effects, in particular to patients with comorbidities. In addition, there are significant synergies in studies integrating different types of data.

8. BQC19 RESULTS

8.1 INTELLECTUAL PROPERTY AND COMMERCIALIZATION

The BQC19 considers its mission accomplished when the data derived are made available to the scientific community under the terms of the Material and/or Data Transfer Agreements and in accordance to the terms stated in the Wellcome Trust Foundation declaration.

Accordingly, the BQC19 and its participating institutions waive any intellectual property rights resulting from the use of the material and data by a material/data User

No intellectual property can be claimed on the initial material and data. Intellectual property rights obtained from the research derived data shall not prevent the broad use of the data by the research community.

Participants shall not financially benefit from their participation and/or the invention of a commercial product created in whole or in part from their biological material and/or data stored in the biobank.

8.2 DISSEMINATION OF RESULTS AND PUBLICATIONS

Scientific data and knowledge are common property and must be shared in an appropriate framework. The BQC19 commits fully to the Wellcome Trust Foundation declaration on "Sharing research data and findings relevant to the novel coronavirus (COVID-19) outbreak" available at: <https://wellcome.ac.uk/press-release/sharing-research-data-and-findings-relevant-novel-coronavirus-covid-19-outbreak>. As COVID-19 represents a significant and urgent threat to global health, the BQC19 is committed to ensuring that research results and data related to this outbreak are shared quickly and openly to guide and inform public health and help save lives (see section 9.3.2.).

The User-Researchers shall mention in their scientific publications and communications (written and oral) that the material and data used were obtained from the BQC19. They will also mention the financial contribution of PHAC, the FRQS and GQ. When a publication is accepted, the User-Researcher will transmit to the BQC19 Manager a copy of the publication, communication and documents mentioning the BQC19 (see section 9.3.2.). Any biological Material or Data Transfer Agreement shall include the necessary provisions to that effect.

A sample text on how to acknowledge and cite the BQC19 and the financial support of its granting agencies is available on the BQC19 website (www.quebeccovidbiobank.ca) – See Annex 10 for the BQC19 Authorship Policy.

8.3 DATA DISCOVERY AND VISUALIZATION PLATFORMS

PUBLIC DATA VIEWER

A public-facing data viewer will be deployed, allowing the following functionalities:

- Discovery of aggregated clinical and epidemiological data;
- By aggregated data, we mean that only data of the type that would be included in scientific publications (for example average age of participants, proportion of participants with severe COVID, proportion of participants with cardiovascular disease) will be presented. No individual data will be available.
- Access without a password;

- Allows users to obtain the number of participants specifying up to two characteristics, and counts of available samples. For example, this will allow users to answer a question such as: "How many women over 50 participated in the BQC19?" ". If fewer than five individuals match the selected criteria, the viewer will display "insufficient data."

NETWORKED DATA DISCOVERY PLATFORM OF AGGREGATED MULTI-*OMIC DATA

A data discovery platform specific to the content of multi-*omics analyses will be deployed, allowing the following functionalities:

- Discovery of the aggregated data from multi-*omic analyzes and analyses of genomic variants (for example, the possibility of determining whether a specific genetic variant is contained in the set of BQC19 genomic sequences); As an example, the Beacon project (<https://beacon-project.io/>) consists in deploying interfaces in several multi-*omics cohorts (similar to those of the BQC19) which allow to extract aggregated data from each of the genomic databases. This is useful, for example, when one wishes to study rare variants.
- Access without a password;
- No possibility of sharing raw data;
- Small cells (less than five results) will not be displayed.

BQC19 DATA ACCESS AND ANALYSIS PLATFORM

In order to improve the use of BQC19 data and make it accessible to a wider range of researchers internationally, we propose to add to the management framework the possibility for web-based platforms other than Globus to search, discover and analyze anonymized clinical data, sample inventory, and multi-*omics analyzes, including genomic, epigenomic, and other similar analyses.

The platforms must have received prior ethical approval, and will be required to comply with the same data access policies as users of the BQC19. In addition, users of these platforms will always have to submit a request to the BQC19 access committee to be able to query, discover and analyze the data in their analyses.

In order to respect the commitments of the BQC19, the platforms collecting anonymous data from the cohort must have data management best practices in place. The security practices and standards in place must ensure the security and confidentiality of all genomic and health data. One such example is the Global Alliance for Genomics and Health (GA4GH) "Framework for responsible sharing of genomic and health-related data" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4685158/>).

9. GOVERNANCE OF THE BQC19

The BQC19 is under the co-direction of Madeleine Durand and Simon Rousseau-

Four people have been hired in 2020 and 2021 by the BQC19: i) a manager, ii) a data and sample coordinator, iii) an ethics coordinator and iv) an access officer, to provide, among other things, strategic, operations and administrative support, and to ensure communication among the various participating institutions (see section 9.3 to 9.6).

Additional staff were hired by BQC19 in 2022, including a database specialist and a data visualization tool developer. A collaborating research professional, attached to the working group on translational research and a coordinator of ethics and inter-institutional contracts will be added to the team in 2022-23 in order to support the activities of the BQC19 during the next phases of the project. See sections 9.4.3, 9.6.1 and 9.6.2 for details.

The organization chart of the BQC19 is available in Appendix 8.

9.1 GOVERNING COMMITTEE OF THE BQC19

The role of the Governing Committee is to:

- Approve the specific rules to access data and biological material as well as related procedures.
- Approve the expertise profiles required for the members of the Access Committee.
- Ensure the implementation of rules and procedures stated by the Québec COVID-Pandemic Network (QCPN) and by the Steering Committee of the BQC19.
- Promptly approve access to data and biological Material based on the recommendations of the Access Committee.
- Make the final decision in the event of a dispute over access to data and biological Material

9.2 STEERING COMMITTEE OF THE BQC19

The BQC19 has a Steering Committee, mandated to evaluate the progress of the BQC19 and the participating institutions, to take scientific decisions, to review the timeline and finances of the BQC19, to make modifications to the latter if necessary and to identify solutions to potential issues along the way. The Steering Committee is also responsible to approve the content of this Management Framework and to ensure it remains up to date.

Furthermore, the Steering Committee is responsible for:

- Maintenance of the BQC19 biological material and data inventory;
- Communications, such as the distribution of the information related to the BQC19 (including the BQC19 website);
- Tracking research data returned to the BQC19, in accordance with the principles of *FAIR* (*Findable, Accessible, Interoperable, Reusable*).

The current members of the Steering Committee are listed below. The Steering Committee aims to include one representative from each participating institution. When a new institution is added a representative from that institution will be invited to join the Steering Committee

9.2.1 MEMBERS OF THE BQC19 STEERING COMMITTEE

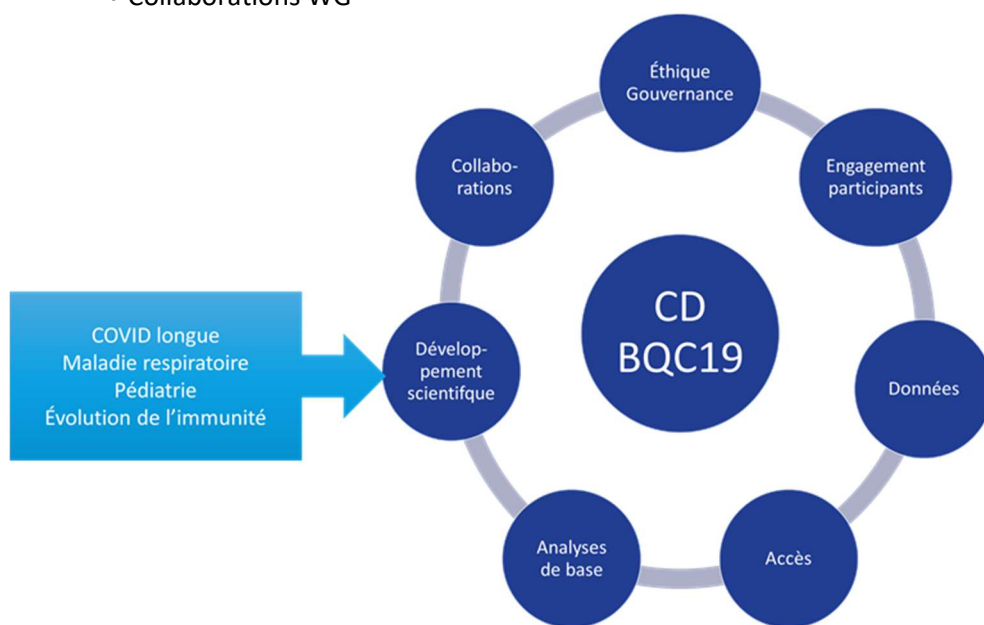
Name	Institution
Madeleine Durand	CHUM
Simon Rousseau	IR-CUSM
Daniel Kaufmann*	CHUM
Brent Richards	Jewish General hospital
Daniel Auld	McGill University
Ma'n H. Zawati	McGill University
Sze Man Tse	CHUSJ
Karine Tremblay	Université de Sherbrooke/CIUSS du SLSJ
Alain Piché	CIUSSS de l'Estrie- CHU de Sherbrooke
Alexandre Montpetit	Génome Québec
Emilia Liana Falcone	IRCM
Guillaume Bourque	McGill University
Christel Renoux	Jewish General Hospital

* In an advisory capacity, non-voting member.

The Manager, the Coordinators and the Access Officer of the BQC19 shall also be ex-officio members of the Steering Committee. They will be non-voting members.

In order to support the steering committee in its decision-making, several working groups (WG) were created in 2022, and replace the sub-committees established in 2020. These working groups include:

- Ethics/Governance WG;
- Translational Research WG;
- WG Data;
- WG Access to data and samples;
- Basic Analysis WG;
- Scientific Development WG (ex. Post-COVID syndrome, pediatrics, respiratory diseases, evolution of immunity);
- Collaborations WG



9.3 BQC19 MANAGER

The duties and responsibilities of the BQC19 Manager, who reports directly to the BQC19 Director, include in particular:

- Support the BQC19 Director and the Steering Committee on governance, strategic planning, communications, finances, reporting, alignment with the COVID-19 immunity taskforce and partnerships with other Canadian COVID-19 Biobanks;
- Provide professional expertise to the Steering Committee on governance, logistics and communications;
- Work closely with the departments within McGill University to implement and manage collaborative agreements, Material and Data Transfer Agreements and Service Agreements etc.;
- In collaboration with the Deputy Director of the McGill Genome Centre, monitor the BQC19 budget and gather necessary information to prepare financial and budgetary analyses and projections for the BQC19 to enhance strategic planning;
- Research: Gather necessary information and provide advice to the BQC19 Director and Steering Committee based on research data, bibliometrics and research funding statistics;
- Manage interactions between the BQC19 and other key players in the scientific community, in particular the COVID-19 immunity taskforce and CanCOGeN/CGEN;

- Liaise between the BQC19 and the Canada Excellence Research Chair (CERC) team working on genomic medicine at McGill University in order to optimize interactions between these major research initiatives;
- Work closely with the BQC19 Director on the medium- and long-term planning of the BQC19, especially in terms of funding.

9.4 BQC19 COORDINATORS

9.4.1 DATA AND SAMPLE COORDINATOR

The duties and responsibilities of the BQC19 Coordinator, who reports directly to the BQC19 co-Directors, include in particular:

- Act as resource person for the participating sites with regards to the BQC19, especially on samples information, laboratory protocols implementation, data entry and management in the BTRSR and RedCAP as well as access management to the secured centralized data processing system;
- Provide training for the BTRSR and RedCAP users in each site and liaise between users and the Telematics Laboratory responsible for programming;
- Ensure communications between the BQC19 Director and the participating institutions, and confirm coordination with operations;
- Prepare and maintain the Standard Operating Procedures manuals (SOP) detailing the BQC19 procedures;
- Monitor clinical activities in sites using the BTRSR and RedCAP databases and focus on acquiring current understanding on patient recruitment/retention in accordance with the competitive recruitment protocol;
- Ensure the quality of the data collected by querying the databases (BTRSR and REDCap), by noting any discrepancies between them, by ensuring the completion of the records and by validating the quality of the data collected in REDCap after querying data entries.
- Act as a resource person for the BQC19 data manager, the data management team, the future database specialist and the developer of the visualization tool.
- Act as manager of the “ticketing” system set up to centralize requests from the community, distributing requests to the appropriate people.
- Act as a resource person for the BQC19 access committee and the access officer, including processing requests for access to samples, preparing transfers of biological material and requests for information concerning data inventories of biological material and clinical data.
- In collaboration with Citadel, act as REDCap administrator for the BQC19 project.
- Organize transfer of funds and/or payment of invoices to sites based on their needs and the pre-determined budget, and maintain a record of all documentation pertinent to the BQC19 financial management;
- Provide regular reporting to BQC19 management on patient recruitment and retention, both actual and planned, with a focus on budget compliance;
- Provide regular reporting to the BQC19 management on actual and planned expenditures related to BQC19 funds;
- Prepare an annual report for the BQC19 Governing Committee and Steering Committee on the distributed data/biological Material and the list of research projects derived from the Biobank. The report shall also include the number of recruited persons, the number of complaints filed by participants and the number of participants who withdrew from the BQC19. This report will be forwarded to the REB reviewer at the annual renewal

9.4.2 ETHICS AND COMMUNITY OF PRACTICE COORDINATOR

The duties and responsibilities of the BQC19 ethics coordinator, who reports directly to the BQC19 co-Directors, include in particular:

- Write the ethical documents and their modifications as required, according to the models and templates in place at the CRCHUM, in English and French
- In the case of documents drafted by the steering committee, adapt them to the CR-CHUM templates.
- Submit and track all ethics submissions in Nagano
- Perform the annual ethical renewal, including obtaining data on recruitment from each site
- Promote changes in ethics to the sites, in order to facilitate their implementation at each site (by means of initiation visits & presentations of the changes to the local teams at each site)
- Liaise with sites not participating in the multi-center evaluation process, and collect the implementation dates of the adaptations (or not, if applicable) of their respective management frameworks
- Maintain the documentation of the different versions of the management frameworks in the different participating centers
- Coordinate the sharing of approved ethical documents with disaffiliated sites, to ensure consistency between sites.
- Plan and facilitate meetings of the community of practice, made up of research staff from all participating sites
- Coordinate with McGill at the contract level, submit contracts for ethics review to the CRCHUM

9.5 BQC19 ACCESS OFFICER

The Access Officer is mandated to manage the access requests submitted to the BQC19. To that end, he/she will:

- Receive requests from researchers and ensure the file is complete and compliant with the process requirements;
- Identify whether the request is for the provincial collection or a local collection; direct (if applicable) the request to the appropriate resource and follow up and coordinate with the BQC19;
- Organize and coordinate the Access Committee meetings in preparation for final assessments;
- Assess and determine the amount of compensation requested from the user-researcher based on the content of the application;
- Prepare meetings minutes of the Access Committee;
- Communicate the outcome of access requests to researchers and to the BQC19 Coordinator.

The Access Officer is also responsible of answering the different researchers' inquiries, regarding access to BQC19 samples and data. To that end, the Access Officer will :

- Receive, acknowledge and respond to requests from researchers;
- Liaise with the BQC19 Coordinator or the Steering Committee as required;
- Receive, acknowledge and evaluate requests for letters of support before sending recommendations to the BQC19 Director.

9.6 DATA MANAGERS

9.6.1 BQC19 DATA MANAGER

The mandate of the data manager will be to manage the experimental and clinical data produced by the BQC19. To do so, they will:

- Ensure the coordination of data administration, relating to the activities of the data management committee;
- Create scripts to manage and compile the multiple forms of data produced per BQC19 participant;
- Ensure the quality of the data collected by querying the participant databases (BTRSR and REDCap), by flagging any discrepancies between datasets, by ensuring records are complete, and by validating the quality of the data collected by issuing queries in REDCap;

- Prepare data extracts and make them available to the scientific community and BCQ19 collaborators via the Globus application, in collaboration with the data access officer;
- Update data dashboards that are presented on the BQC19 website;
- Create a data access request form, in collaboration with the data access officer;
- Administer and implement best practices related to data management and accessibility, in order to promote the spirit of 'open science' within the BQC19 and among our collaborators.

• 9.6.2 RAMQ DATA ACCESS COORDINATOR

The RAMQ data access coordinator is responsible for managing access to clinical data obtained from the Régie d'Assurance Maladie de Québec (RAMQ), and ensure linkage with the data generated by the BQC19.

10. ACCESS COMMITTEE OF THE BQC19

If the submission concerns only samples and/or data from the local collection, the evaluation and access process will be the responsibility of the Access Committee at the participating institution, unless the institution wishes that the BQC19 Access Committee complete the evaluation. In the absence of a local Access Committee that adheres to the access principles of the BQC19, the evaluation will be conducted by the BQC19 Access Committee. In the event that the evaluation is completed by a local Access Committee, the decisions and the following information: project title, investigator(s), ethics committee approval number, samples and/or data requested and provided, shall be communicated to the BQC19 Access Committee in order to maintain a log of use. Access requests for the provincial collection will be submitted through the BQC19 website access portal. The Access Officer will receive these requests and conduct an administrative analysis of the submissions to ensure that all fields have been completed by the User-Researcher and that all documents associated with the request have been attached (see section 10.5). Thereafter, the submitted request will be evaluated by the BQC19 Access Committee. The roles of the QCPN and the Access Committee are defined hereinafter.

10.1. ROLE OF THE BQC19 STEERING COMMITTEE IN THE ACCESS PROCESS

The BQC19 Steering Committee will ensure that the Chair, members of the Access Committee and the access process are not subject to any conflict of interest. The BQC19 Steering Committee will ensure this through documentation that will include a conflict of interest disclosure signed by each stakeholder, clear and publicly available access procedures, as well as minutes of the Access Committee meetings. The BQC19 Steering Committee is responsible and accountable for the integrity of the process.

The BQC19 Steering Committee is responsible for forming an impartial and independent Access Committee (The Chair and voting members of the Access Committee shall not have any affiliation with the BQC19 Steering Committee and shall not be involved in the collection of samples and data).

The BQC19 Steering Committee enforces the rules and criteria for access to the BQC19 as approved by the Governing Committee.

The BQC19 Steering Committee, in conjunction with the Access Committee, maintains an overall vision at the provincial level to encourage joint use of samples. The Committee supervises the Access Officer who is the person in charge of the administrative/operational access process, as described above, for the BQC19 data and biological samples. The Access Officer may redirect requests to local biobanks when appropriate.

The BQC19 Steering Committee ensures the confidentiality of access requests as well as the confidentiality of the documents related to their evaluation.

10.2 ROLE OF THE ACCESS COMMITTEE

The Access Committee is responsible for:

- Analyzing requests submitted by the Access Officer in accordance with the access rules and criteria and as approved by the Governing Committee;
- Analyzing requests according to a schedule created by the BQC19 Steering Committee;
- Providing, through the Access Officer, the results of the assessments to the Governing Committee;
- Ensuring that the Access Officer prepares and forwards the minutes of the Access Committee meetings to the BQC19 Steering Committee.

10.2.1 MEMBERS OF THE BQC19 ACCESS COMMITTEE

Composition of the Access Committee – required expertise:

- Immunology/vaccinology, virology/infectious diseases/systems biology (-omics), pharmacology/pharmacy, statistics, epidemiology, biobank expert, ethics, patient partner;
- One member should be able to identify the risks of re-identification of participants. Depending on the projects submitted, additional expertise may be required for an appropriate assessment. The Access Committee will engage external experts on an ad hoc basis. In particular, if projects involve pediatric population samples, a pediatric expert will be called in to the committee;
- Non-voting members: Access Officer and a representative of the BQC19 Steering Committee approved by the QCPN;
- Regional representation (regardless of the size of the contribution of the participating institutions to the BQC19). Representatives from outside Quebec will be accepted;
- At least two potential members will be identified by expertise (management of conflict of interest/attendance management, etc.);
- The chair and members of the Access Committee are not in any conflict of interest situation with respect to the evaluated applications.

10.3 MEETINGS AND MINUTES OF THE BQC19 ACCESS COMMITTEE

The Access Committee shall meet if necessary on a regular basis, by any appropriate means (e.g., in person, via teleconference, shared files) to review access requests depending on their frequency. Access decisions shall be taken by a majority of votes. Discussions and decisions of the Access Committee will be documented in the minutes by the Access Officer sitting as an observer.

10.4 PROCEDURES FOR ACCESSING BQC19 BIOLOGICAL MATERIAL AND DATA

10.4.1 FREE ACCESS

Data with a very low risk of re-identification and no particular vulnerability (“open access data”), such as metadata and aggregated patient cohorts, etc. will be made public online on the BQC19 website without formalities.

10.4.2 CONTROLLED ACCESS

Biological material and data with a direct or higher risk of re-identification and/or special vulnerability will always be considered as controlled access data. These data shall remain within the network side of the data management application, whose access is strictly controlled. These data will follow the processing procedures listed in Section 6

10.4.3 ACCESS GRANTED TO REVIEWERS

A limited level of access will be granted to external reviewers, as part of the publication process of scientific articles, to facilitate the verification of data included in the article. This access will be conditional on the fact that the article is matched with an access request accepted by the research team which produced the article under review, and that the reviewer signs a commitment to confidentiality and a commitment not to use the data for purposes other than validation of the article under review. Access will be granted for a limited period (4 weeks.) Access to the data will be carried out via the BENTO platform, where downloading of data will not be permitted. Access will be granted to reviewers by the BQC19 coordinator, and will be removed as soon as the review work is completed.

10.5. GUIDING PRINCIPLES TO ACCESS BQC19 DATA AND BIOLOGICAL MATERIAL

Eligibility criteria for submitting an access request:

- Academic Researcher in Canada;
- Academic Researcher outside of Canada;
- Researcher in the private sector.

Access will be allocated in a fair, non-discriminatory, objective and transparent manner to all researchers, regardless of their research discipline:

- Well-defined and publicly available rules of access conditions and priorities;
- Adherence to the access processes, rules and criteria of all involved;
- Data may be accessible by everyone, subject to authorizations, legal frameworks and regulations, and depending on the nature of data.

Various research projects may benefit from the use of BQC19 biological Material and data. Given the objectives of the BQC19, academic researchers, HSSN and private sector researchers, in Canada and worldwide, may access the BQC19 biological material and data if their research projects meet appropriate scientific and ethical standards and are approved by the duly constituted REB.

Access to data and biological material shall be subject to an access fee.

The use of data must be consistent with consents given by the participants: Access must respect the rights, interests and expectations of the BQC19 participants and must support initially consented research by the participants, in line with the BQC19 mission.

Data access, a renewable resource, will be provided to enable rapid use of data by all requesters in order to meet the urgent needs for research n COVID-19. . An expedited evaluation process will be available for data only access requests.

Access to biological Material, a limited resource, must be completed responsibly and with sufficient justification. Access to biological samples is not available through the expedited process.

Applications will be evaluated according to the defined criteria including, but not limited to, the value of the data returned to the BQC19, the scientific contribution of the research project and the potential impact of the access to the samples on the risk of depletion. The evaluation shall also respect *FAIR* principles (*Findable, Accessible, Interoperable, Reusable*) (<https://www.nature.com/articles/sdata201618>)

Samples use limitation criteria:

- Demonstrated scientific validity, consistent with the BQC19 mission: The use of the Biobank resources must help to maximize scientific, clinical and social advantages.

Independent peer review will be recognized and used by the Access Committee:

- The access process must demonstrate and continuously enhance the value, utility and sustainability of the BQC19. It shall also maintain the reputation of the BQC19, the participating institutions and the granting agencies.

Any experimental data or new clinical variable data made possible by the access must be communicated to the BQC19, and must become accessible to third parties (adoption of FAIR principles, Open Access/Wellcome Chart COVID)

Maintaining a registry of all projects benefiting from access to the BQC19 biological Material and data. This registry will be made available to the research communities in whole and the general public.

10.5.1. DATA SECURITY AND PROTECTION

Recipients of data and biological Material shall complete all training required as stipulated by the rules and regulations on the use of human biological data and specimens in research. Special attention shall be paid to the expertise of the teams manipulating the data, without risk of re-identification, in particular in projects involving artificial intelligence approaches.

The use of data (clinical and/or experimental data derived from human biological samples) for research purposes in compliance with the BQC19 commitment to the participants in the study, requires that the applicant: 1) protect the coded data; 2) does not attempt to re-identify participants; and 3) minimizes this risk in analyses. Applicant researchers are invited to submit with their access request any documentation supporting their ability to meet these commitments (e.g., prior publications using data derived from human participants, ethics training, etc.) or to undergo training on these matters if no previous experience is documented.

APPLICANT OBLIGATIONS: GUIDELINES AND INSTRUCTIONS

The following data safety and confidentiality rules must be respected when using the data

The researcher and his/her affiliated organisation shall agree to:

- Sign, or have persons accessing the research data sign, a confidentiality agreement and provide a copy of the signed documents to the BQC19

The researcher or any member of his/her research team who has access to the data shall agree to:

- Comply with the obligations set forth in the Material Transfer Agreement for its entire duration and thereafter with any obligation having an impact beyond that duration, including confidentiality;
- Comply with all directives and instructions provided by the BQC19 regarding the exploitation of data, including physical security, computer security and confidentiality;
- Use the data only for the project approved by their institution's ethics committee and by the BQC19 Access Committee, and not to use the data for administrative or commercial purposes;
- Make no attempt to re-identify individuals;
- Restrict data access to anyone except those who need it specifically for the conduct of the project as submitted and accepted by the Access Committee;
- Not to disseminate any results that may link an information, even indirectly, to an individual or any other identifiable unit, such as a business, health facility, school, etc.

10.5.2. ACCESS REQUEST PROCESS

The process to allow controlled access to the biological material and data is initiated by an application submission via the access portal on the BQC19 website.

1. The researcher must submit an access request that includes a summary of the research project, a justification of the types and quantities of the requested biological material and data, as well as a proof or availability of funding required to carry out the project.
2. The BQC19 Access Officer shall verify the availability of the Material with the BQC19 Coordinator ~~and determine in which participating institutions the appropriate biological Material are located.~~
3. A cost recovery will be calculated and requested from the researcher for every use of samples and data. (see section 10.6).
4. The Access Officer shall initiate an administrative review of the submitted application. As a result, the project shall be subjected to an expedited evaluation process, if the application refers only to data; or to a regular evaluation process for all applications involving biological samples or requiring to re-contact to participants. Access to the BQC19 data and samples shall solely be granted by the BQC19 Access Committee and by the Access Committee at the participating institution for local data or samples. The access request shall be considered only if the research projects meet the following conditions:
 - The research project must respect the objectives of the BQC19 and the scope of the participant' consent;
 - The research project must have a scientific value and be scientifically sound;
 - The research project must be submitted and performed by qualified researchers;
 - The research project must be approved by the duly constituted REB for the expedited process or the regular one, at the latest following the approval of the Access Committee, and prior to signing the biological Material and Data Transfer Agreements, namely:
 - The REB that would be competent to review and approve the project (i.e., the REB that is competent to review the studies of the requesting researcher); or
 - The REB of the CHUM, in the event that the REB is not competent to review and approve the project; or
 - If the applicant researcher is from a jurisdiction where non-identifiable research data and biological material are exempt from ethics review, the REB of the CHUM shall undertake the project ethics review.
5. Once access is approved and the ethics approval is provided, a biological Material and Data Transfer Agreement must be signed. This agreement shall be signed by the User-Researcher of the biological material/data and their institution prior to sending the Material and data. This agreement shall include, in particular, provisions related to the following conditions:
 - Cost recovery measures for the data, biological material and services, as applicable;
 - Measures in effect to ensure confidentiality;
 - The fact that data and biological material shall not be used to create a new biobank;
 - The fact that data and biological material shall not be shared with an unapproved third party and must be returned to the BQC19 or destroyed at the end of the project;
 - Acknowledgement in the publication and communication of the research results of the financial support of the FRQS, GQ and PHAC as well as the contribution of the BQC19 and the local infrastructures of the participating institutions;
 - The fact that 1) the raw data analysis completed on; 2) any new clinical information; and 3) all project publications, will be shared with the BQC19 so that they can be incorporated into the BQC19 database.
6. Preparation and sending of biological Material and associated coded data.
7. Sending the request for compensation.
8. Follow-up on publications with the User-Researcher.

10.6 COST RECOVERY

The BQC19 was formed during a public health emergency, and its establishment was supported by public funds. In order to ensure its durability, a mechanism of cost recovery shall be implemented to enable its growth and partial self-funding in the long term. This request of compensation shall consider the number of variables used, the number of participants included in the study and the number of hours required for the preparation of the data export file.

The following principals must be respected in cost recovery:

- The BQC19 shall allocate a cost recovery, calculated and defined before the distribution of the material/data to the academic researchers, the HSSN and the industry as determined by the BQC19 Governing Committee;
- The BQC19 shall operate on a mixed cost method (cost per project and cost for the infrastructure maintenance). The latter must take into account the BQC19 operating cost in the short and long term;
- Access fees will be determined by the Governing Committee and be reflected in the access agreement. The biobank determines the cost by using an agreed-upon method, as suggested by the Canadian Tissue Repository, to calculate costs and determine user fees to be invoiced to researchers for services related to accessing the biobank.

10.7 SHIPPING OF THE BQC19 BIOLOGICAL MATERIAL

The BQC19 biological material must be considered potentially infectious. Therefore, it must be handled, packaged, labelled and accompanied by documents required by the different regulatory agencies, when shipped. In Canada, the transportation of infectious Material is governed by the Transportation of Dangerous Goods Act, 1992 (TDGA), the *Transportation of Dangerous Goods Regulations* (TDGR) and the International Air Transport Association (IATA) *Dangerous Goods Regulations* (DGR).

In the event of international shipping, the shipper must be informed on the rules and regulations of the receiving country in order to combine them of those in Canada. All packages shall be sent with a certainty that they will not be delayed by the authorities.

10.8 PARTNERSHIP INITIATIVES

Partnering with national and international initiatives that can be mutually beneficial is one of the expected objectives of the BQC19, especially by PHAC.

10.8.1 SHARING OF DATA COLLECTED BY THE BQC19 WITHIN THE FRAMEWORK OF PARTNERSHIPS

The data collected by the BQC19 may, under the conditions stated hereinafter, be shared through a contract and upon the approval of the Steering Committee and the Governing Committee. Data must be shared in a non-identifiable form and these partners shall become custodians of these data. Therefore, they shall not be subject to the process detailed in section 10.4 and 10.6. The principles governing these partnerships are as follows:

- The vision and the mission of the partnership initiative must align with those of the BQC19, in particular to the adoption of the principles outlined in the Declaration of the Wellcome Trust Foundation;
- The data access and sharing processes of the partnership initiative should be governed by the same principles as those of BQC19;
- The processes in place by the partnership initiative for access and sharing of data received from the BQC19 shall be subject to the conditions outlined in the Consent Form signed by BQC19 participants;
- Only non-identifiable data from the BQC19 shall be shared with the partnership initiative;
- Although shared with the partnership initiative, these data shall remain available to the scientific community through the channels specific to the BQC19 which are detailed in sections 10.4 and 10.6;
- The participant identifiable nominal information shall be managed only by the BQC19.

The development of these partnerships must be the subject of a prior amendment of this Management Framework and be approved by the CHUM REB acting as REB reviewer on behalf of the HSSN institutions.

10.8.2 PARTNERSHIP INITIATIVES

10.8.2.1 HOSTSEQ

CGEn HostSeq is a joint research program of the *Hospital for Sick Children*, McGill University and the *University of British Columbia*, funded by the Government of Canada and administered by Genome Canada. As part of this program, 10,000 genomes will be sequenced (whole-genome sequencing) from the DNA extracted from the blood of SARS-CoV-2 infected patients, with the goal of accelerating COVID-19 research by sharing these data with the scientific community, through a rigorous and independent access process.

Given that the principles set forth in section 10.8.1 are being met, a partnership between the BQC19 and HostSeq shall be formed to share with the latter the whole-genome sequencing data derived from the BQC19 samples as well as the data collected in the CRF of the BQC19.

The Governing Committee has approved, in its meeting on June 15, 2020, the principle of a collaboration agreement with CGEn HostSeq for the whole-genome sequencing of the BQC19 samples. This sequencing shall be performed at the McGill Genome Centre at McGill University and sequencing data shall be made available to the scientific committee as detailed in section 10.8.1.

10.8.2.2 EUROPEAN GENOME-PHENOME ARCHIVE

To ensure the sustainability of the data beyond the funding of the BQC19, we propose to deposit the data in the genomic data archiving site European Genome-Phenome Archive (<https://ega-archive.org/>). The EGA is internationally recognized by scientific journals and facilitates the process of filing publications by users of the BQC19. Requests for access to BQC19 data by the EGA archive will always pass through the BQC19 access committee.

10.8.2.3 PAN-CANADIAN GENOME LIBRARY

The Pan-Canadian Genome Library (PCGL) is a Canadian initiative hosted at McGill University, funded by the Government of Canada, and administered by CIHR. Under this program, genetic and clinical data will be deposited and made accessible to researchers in Canada and abroad through a rigorous and independent access process.

Given that the principles set out in section 10.8.1 are respected, a partnership between the BQC19 and the PCGL will be formed to share with the latter the whole genome sequencing and genotyping (GWAS) data derived from BQC19 samples, as well as the BQC19 clinical data collected. The Governing Committee approved the principle of a PCGL collaboration at its meeting on November 21, 2024.

11. CONTINUITY OF THE BQC19

If the BQC19 Lead Researcher at the participating institution is no longer qualified to manage the BQC19, another investigator may be appointed for that institution. In the event that no researcher has expressed an interest in joining the BQC19, the direction of academic research of the CISSS and the CIUSSS, or the CHU research centre Director shall appoint a new lead researcher.

If no Lead Researcher has been identified, or if the Director of research decides that the BQC19 is no longer an essential infrastructure for the institution, the process of dissolving this BQC19 site by the institution's decision is initiated.

In this case, the biological material may:

1. Remain in site and be managed by the BQC19 staff on the premises.

If the BQC19 Lead Researcher at the closed institution wishes to keep the BQC19 biological material and data at the institution:

- Data extraction is done to remove the biological material data and samples from the management application BTRSR;
- The data is deposited in a raw database that is made available to the researcher;
- The researcher retains the local database as well as the raw database. The BTRSR application is removed;
- The institution is removed from the BTRSR network database.

2. Be transferred to another participating site.

The biobank is closed at the institution and samples are transferred to another site.

- Data extraction is done to build a list of inventory of the biological material;
- Information related to biological samples missing from the physical inventory are deleted from the network database. Participants are checked against the local database to eliminate those who do not match any sample;
- The biological material is transported physically to the new site;
- All biological Material are assigned to the new institution database. The former biobank in the closed institution is deleted from the database;
- Local database is retrieved by the new institution. The LTB shall assist to recode the participants in the retrieved local database in order to ensure the integrity;
- The hosting institution must modify the location and number of participants of all biological material transferred into the network database.

3. Be destroyed, as a last resort option.

The institution's biobank is closed and it is not possible to retrieve the biological material:

- The biological material is destroyed ;
- Data extraction is done to remove from the BTRSR and data related to the biological material in question;
- The institution is removed from the network database;
- The information in the local database is deleted.

12. ETHICS FOLLOW UP

The CHUM REB has approved this Management Framework through a multi-centric review and shall provide a follow up for the participating institutions of the HSSN. Given the current health emergency situation at the time of the Management Framework of the Quebec COVID-19 Biobank – version 17.0 – 2025-02-27

creation of the BQC19, this Management Framework will require revisions. During the health emergency situation, any amendment in procedures required to ensure the security of the participants or of the research staff shall not require any ethics approval prior to its implementation. The REB must be involved at the earliest possible time in order to share the risk reduction measures with other institutions.

13. REVISION

A thorough revision of this Management Framework shall be undertaken every five (5) years. Failing a revision within the five (5) year time limit, the latest version of the REB approved Management Framework shall remain in force.

List of Appendices

Appendix 1: Site Identification

1A : CR-CHUM

1B : Jewish General Hospital

1C : CHU Sainte-Justine

1D : CIUSSS Saguenay-Lac-Saint-Jean / UQA-Chicoutimi

1E : IUCPQ

1F : MUHC

1G : CR-CHUS

1H : CHU-Québec

1I : CIUSSS-NIM / Sacré-Cœur Hospital

1J : IRCM

1K : Genome Québec

Appendix 2: Pediatric Management Framework

Appendix 3A: MUHC Biobank Management Framework

Appendix 3B: IUCPQ Biobank Management Framework

Appendix 3C: JGH Biobank Management Framework

Appendix 4: Manuals of operating procedures per site

Appendix 4A: Process to send text-messages to offer BQC19 participation

Appendix 5: Description of the BTRSR

Appendix 5A : Transfer of nominal information to institutions external to the BQC19

Appendix 6: Request for Withdrawal

Appendix 7: Certificate of Destruction

Appendix 8: Organizational Chart of the BQC19

Appendix 9: BQC19 Data Sharing Policies

Appendix 10: BQC19 Authorship Policy