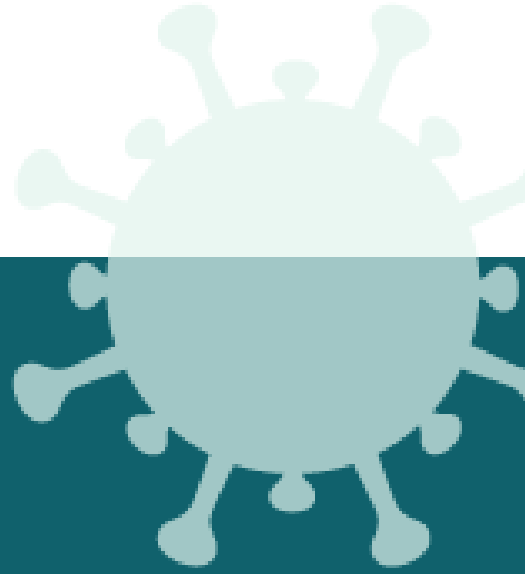
Concerted study of the impact of the COVID-19 pandemic on the rehabilitation care for post-stroke users in the province of Québec

Palak Vakil, Perrine Ferré, Johanne Higgins, Louis-David Beaulieu, Claude Vincent, Kimberley Singerman, Diana Zidarov, Marie-Hélène Milot & Marie-Hélène Boudrias

Outline

- Background
- Objective & Hypotheses
- Methodology
- Preliminary Data Analysis Results
- Significance
- Future Plans
- Acknowledgements

Background



Impact of COVID-19 pandemic in rehab care

- Stroke rehabilitation follows standardized protocols that promote high-quality care for functional recovery.

- Rehabilitation services disrupted during the COVID-19 pandemic.
  (World Health Organization (WHO), 2020)

1. Challenges *(Spielmanns, et al., American Journal of Physical Medicine & Rehabilitation, 2021)*
   - Rehab treatment involves frequent prolonged & close interactions
   - Communication
   - Involving family/caregivers in the delivery of care

2. Post-stroke deficits exacerbation when contracting COVID-19 infection.
   (Wang, et al., Journal of stroke and cerebrovascular diseases, 2020)

3. Rehab staff *(Bayly et al., Palliative Medicine, 2022)*
   - Redeployment of the multi-disciplinary team
   - Increased workload
   - Staff working in both hot/cold zones

Impact of COVID-19 pandemic in Québec

1. Prevention of the occurrence & transmission of cases in the province *(Government of Québec, 2022)*
    - Multiple recommendations from regulatory agencies by the Ministry of Health and Social Services (MSSS) & National Institute of Excellence in Health and Social Services (INESSS)
    - Creation of COVID-19 designated rehabilitation centres
2. Challenges *(Smith et al., The Canadian journal of neurological sciences, 2020)*
    - Physical distancing
    - Compulsory requirements of Personal Protection Equipment (PPE) kits
    - Limited staff due to COVID-19 illness
    - Increased risk of infection

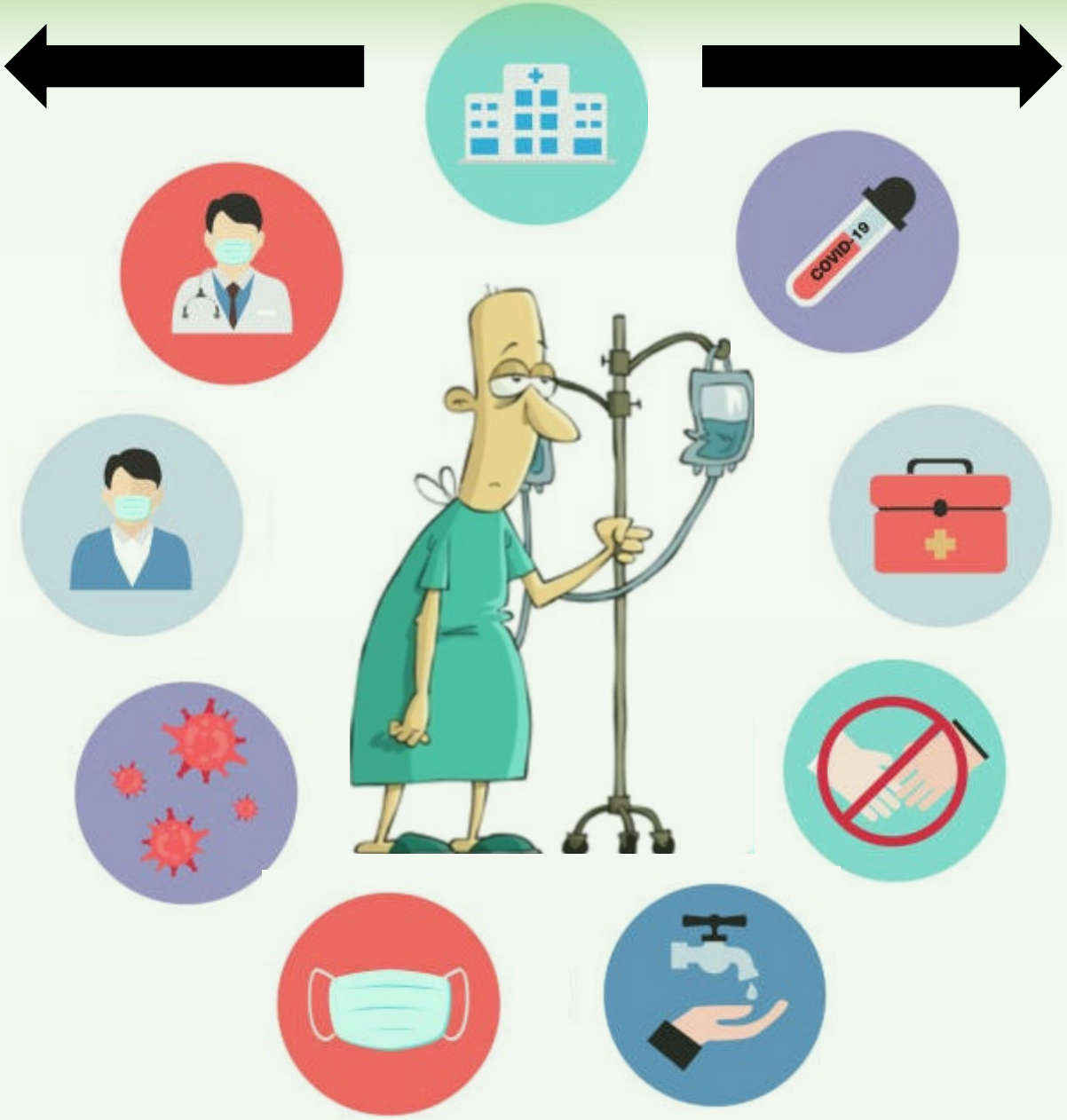
COVID-19 designated rehabilitation centres

	Affiliations	Sites
1.	Centre intégré universitaire de santé et de services sociaux (CIUSSS) du Bas St Laurent	Unité de réadaptation fonctionnelle intensive du Mont Joli
2.	CIUSSS du Saguenay Lac St Jean	Hôpital Jonquiere
		Hôpital Dolbeau
3.	CIUSSS de L'Estrie- Centre hospitalier universitaire de Sherbrooke (CHUS)	CHUS
4.	CIUSSS du Centre Ouest de l'ile de Montréal	Jewish General Hospital (JGH) Institut de réadaptation Gingras-Lindsay-de-Montréal (IRGLM) Catherine Booth / Richardson
5.	Hôpital de réadaptation Villa Medica	Hôpital de réadaptation Villa Medica (HRVM)
6.	Centre intégré de santé et de services sociaux (CISSS) de l'Outaouais	Centre de réadaptation en DP de l'Outaouais
7.	CISSS de Laval	Jewish Rehabilitation Hospital (JRH)
8.	CISSS de Lanaudière	Centre Multiservices de Santé et de Services Sociaux (CMSS) Claude David
9.	CISSS des Laurentides	Hôpital de St Jérome
10.	CISSS de la Montérégie Ouest	Hôtel Plaza Valleyfield

COVID-19 units

Hot zone

COVID+



Non-COVID-19 units

Cold zone

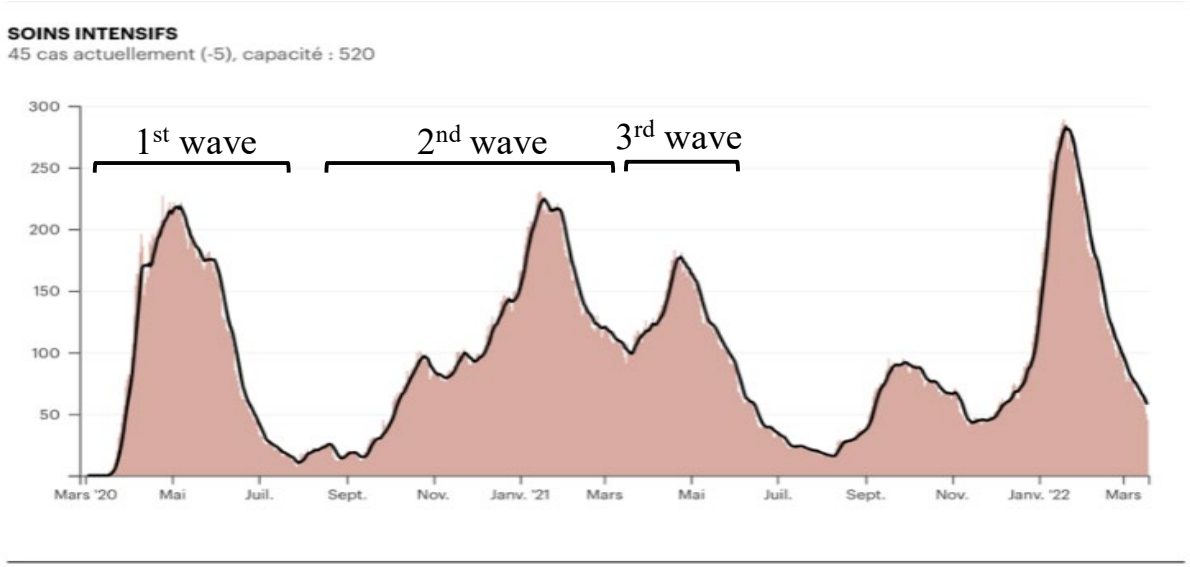
COVID-

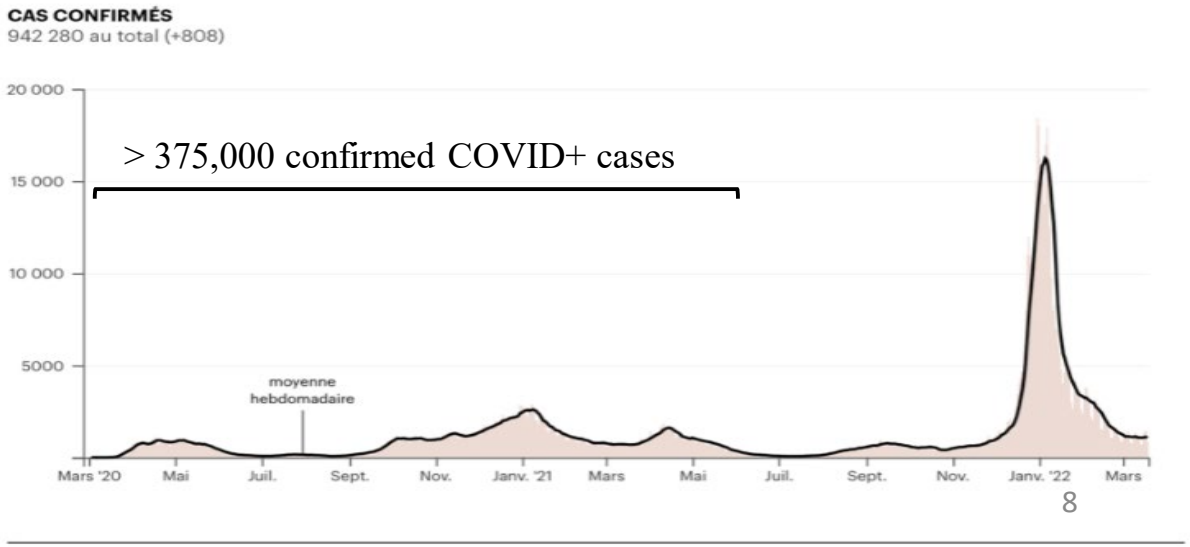
Impact of COVID-19 pandemic in Québec

- 6 waves of the pandemic in Québec

- During the first 3 waves - between March 2020 to May 2021
    a. Limited vaccine provision
    b. More severe COVID+ cases
    c. ↑ Intensive Care Units (ICU) admissions

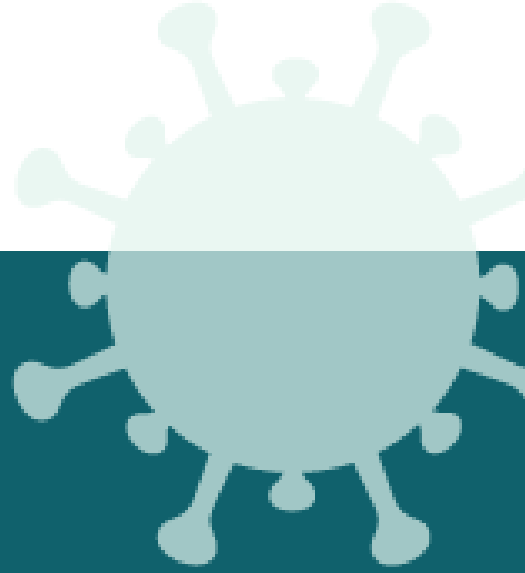
COVID-19 pandemic data in Québec





Institut national de santé publique du Québec (INSPQ); Charts: Le Devoir

Objective & Hypotheses



Objective

- To determine the impact of the COVID-19 pandemic on rehabilitation potential and care in stroke individuals admitted to a COVID-19 designated rehabilitation centre in the province of Québec.

Hypotheses

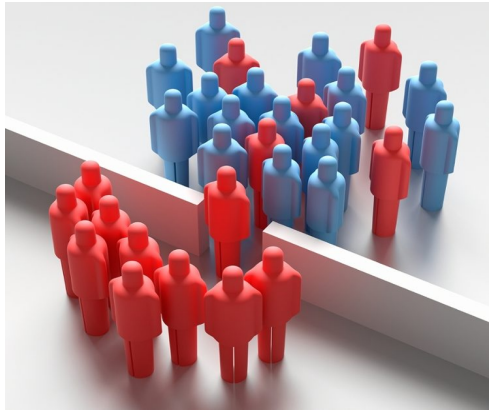
- In comparison to the **pre-COVID** patients (admitted a year before the pandemic), the rehabilitation potential and care trajectory will be negatively affected:
    - In **COVID+** patients due to deterioration of health condition
    - In **COVID+** & **COVID-** patients due to operational changes in the provision of rehabilitation services and underlying health condition

Study Design & Methodology

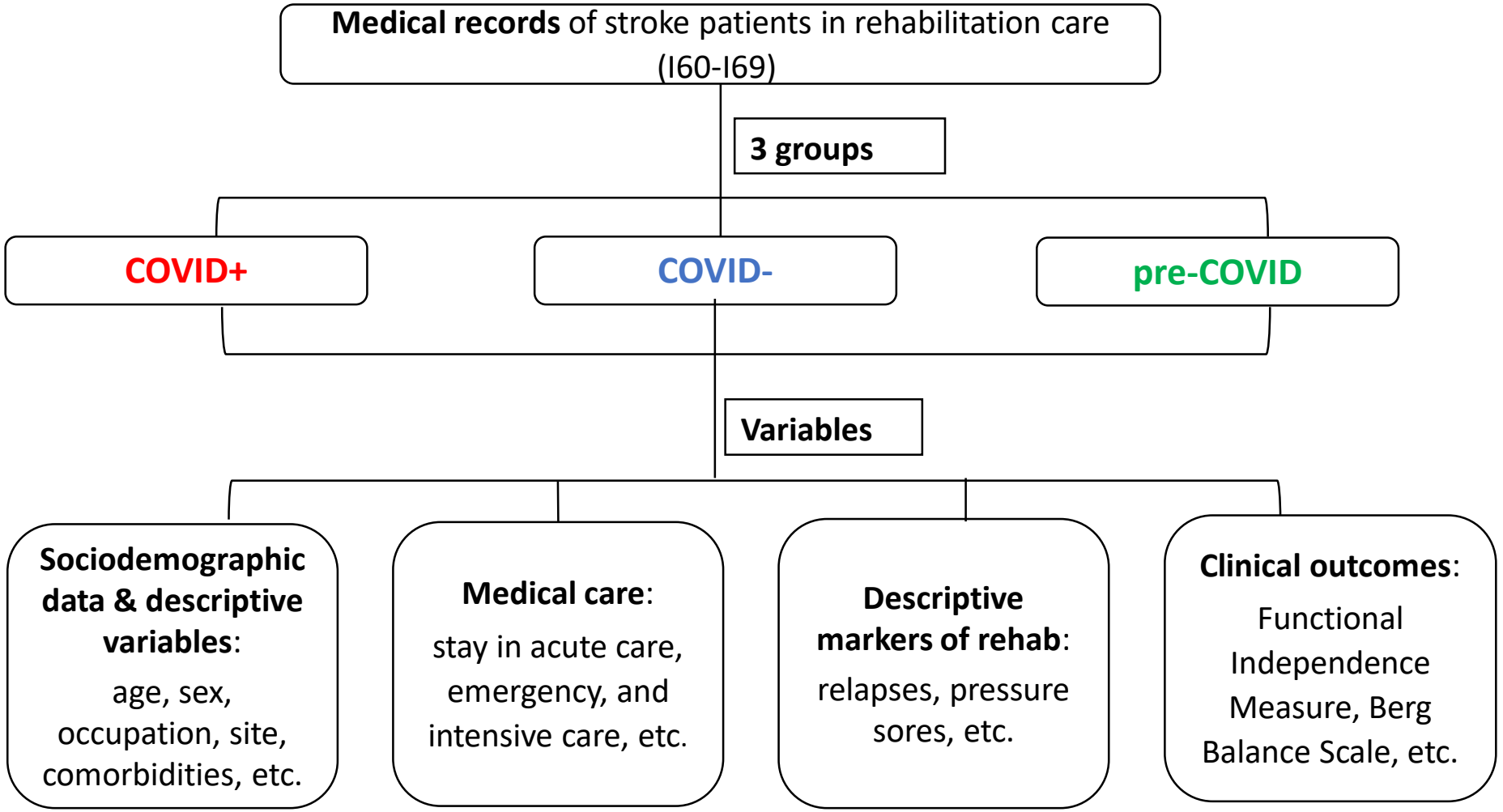
Study Design & Methodology

- Retrospective cross-sectional study of the medical records
- Ongoing data collection in 10 COVID-19 designated rehabilitation centres

- Inclusion criteria
  - **Age**: 18 years and older
  - **COVID+** group: being diagnosed on the basis of a PCR test before or during admission to a rehabilitation center
  - **COVID+** & **COVID-** groups: being admitted to a COVID-19 designated rehabilitation center between March 2020 and May 2021
  - **pre-COVID** group: being admitted to a COVID-19 designated rehabilitation center between March 2019 and Feb. 2020



Flow chart



*(International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10), World Health Organization (WHO), 2019)

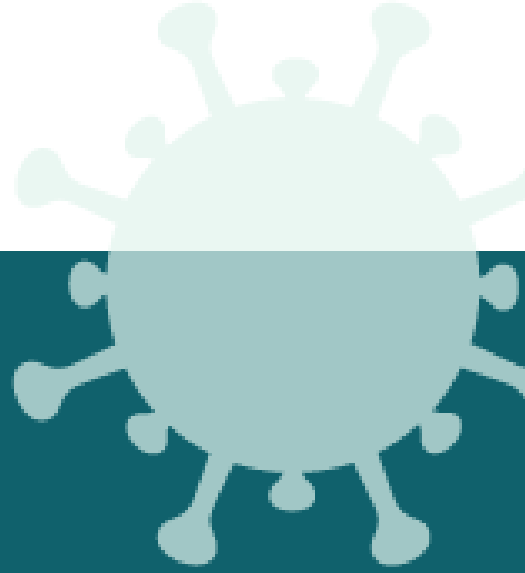
Variables part 1

Socio-demographic data & descriptive variables	
Age	Laterality
Sex	Language
Home address	Civil status
Site of admission	Social occupation level
No. of comorbidities	Specific diagnosis
Prior medical care	
Emergency care	Intubation care
Intensive care	Acute care
Descriptive markers of rehabilitation	
Pressure sores	Delirium
Neuropathy	Dysphagia
Contracture	Oxygen
Relapse	COVID status progress
Rehabilitation care	
Physiotherapy (PT)	Specialized education
Occupational Therapy (OT)	Nurse
Orthopedic	Respiratory therapist
Psychiatry	Dietician
Neuropsychiatry	Other specific treatments
Social Worker	

Variables part 2

	Impairments	Discipline(s)	Assessment methods
1.	**Global Disability**	Physical therapist (PT) /Occupational therapy (OT)	**Functional Independence Measure (FIM)**; Chedoke-McMaster Stroke Assessment (CMSA); Functional Autonomy Measuring System (SMAF); Chedoke Arm and Hand Activity Inventory (CAHAI); Post-stroke score; Unilateral Spatial Neglect (USN); Albert's Test; Bells; Ashworth scale; Glasgow scale; Mayo-Portland Adaptability Inventory (MPAI); Braden scale; Erasmus MC modifications to the Nottingham Sensory Assessment (EmNSA)
2.	**Upper extremity motor control & coordination**	OT	Purdue Pegboard Test (PPT); Box & Block Test (BBT)
2.	**Depression**	PT/OT/Neuropsychology	Depression; Hospital Anxiety & Depression Scale (HADS); Geriatric Depression Scale Short form (SSGDS)
3.	**Cognition**	PT/OT	Montreal Cognitive Assessment (MOCA); Mini-Mental Scale Examination (MMSE)
4.	**Ambulatory**	PT/OT	Walk speed; Walk distance; 6-Minute Walk Test; 2-Minute Walk Test
5.	**Balance**	PT/OT	Bergs Balance scale (BBS); Mini-Balance Evaluation System Test (Mini-BEST); Timed Up & Go (TUG); Fall risk score
6.	**Strength**	PT/OT	Muscle strength evaluation; grip strength
7.	**Dysphagia**	PT/OT/SLP (Speech Language pathologist)/ Dietician	Dysphagia; Malnutrition score
9.	**Pain**	PT	Pain; Pain, Enjoyment of Life & General Activity (PEG) scale
8.	**Quality of life**	PT/OT	Patient Health Questionnaire (QSP); European Quality of Life (EUROQL)

Preliminary Data Analysis Results



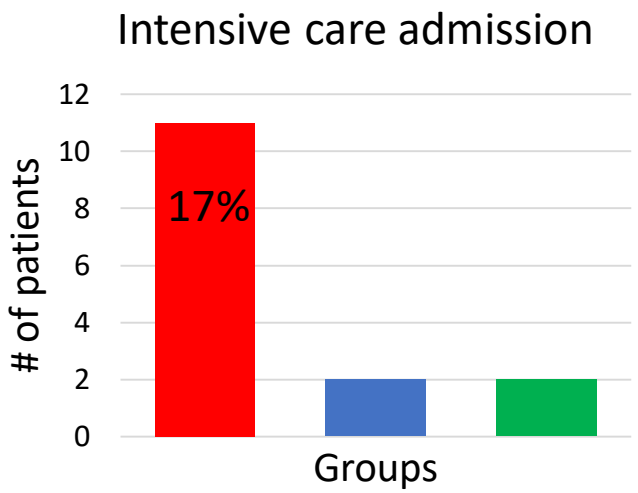
Villa Medica (VM) & Jewish Rehabilitation Hospital (JRH)

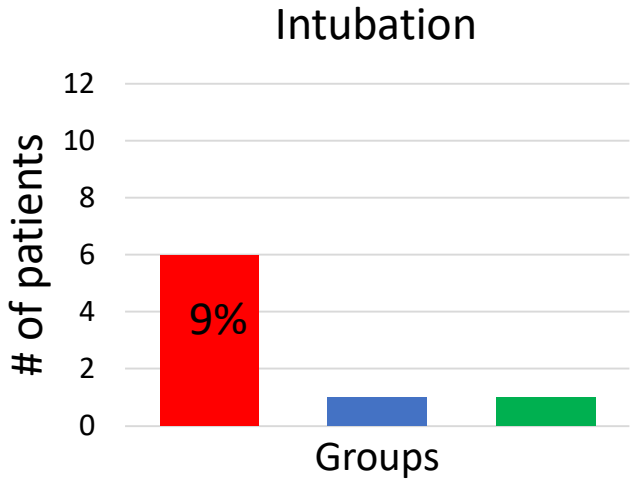


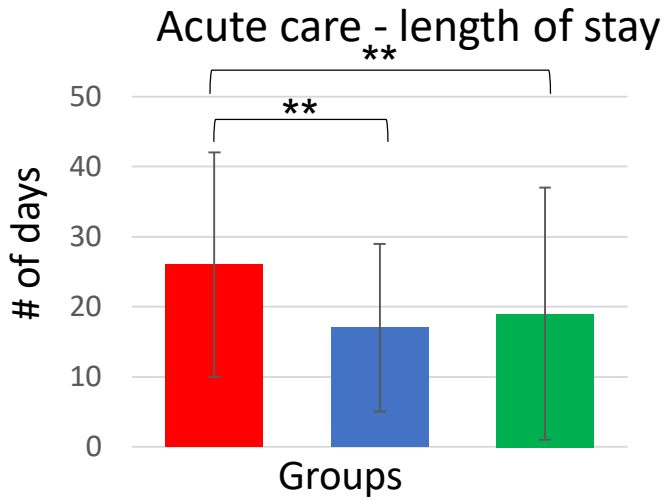
	Baseline characteristics	COVID+	COVID-	pre-COVID
1.	# of patients	64	64	64
2.	Age in years (mean ± sd*)	75 ± 12	76 ± 9	74 ± 9
3.	Sex: Male/Female	29/35	29/35	29/35

*sd: Standard Deviation

Comparison between the 3 groups - Medical Care



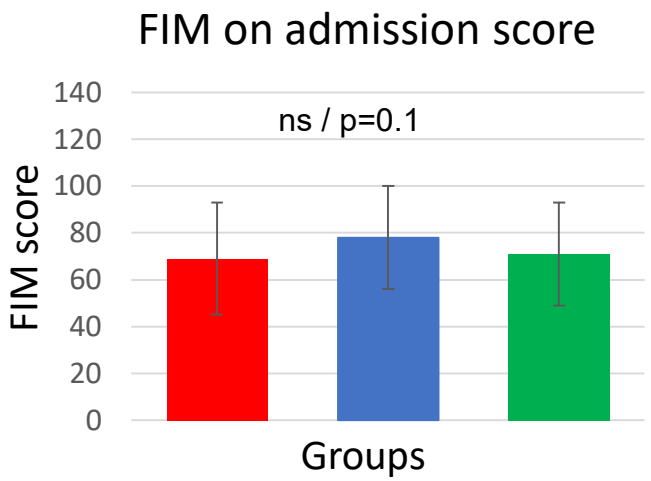


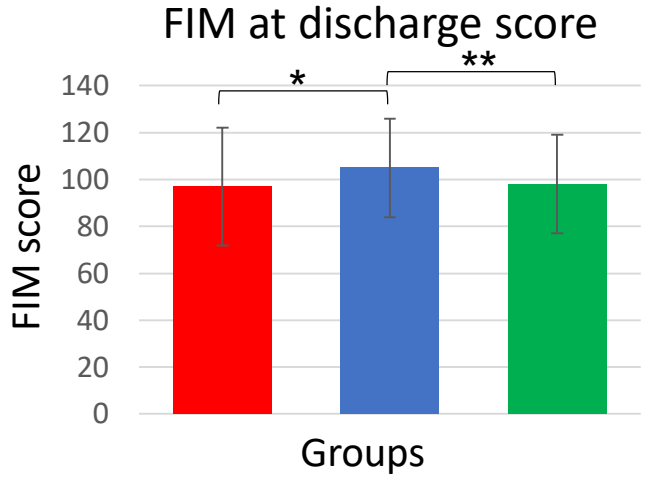


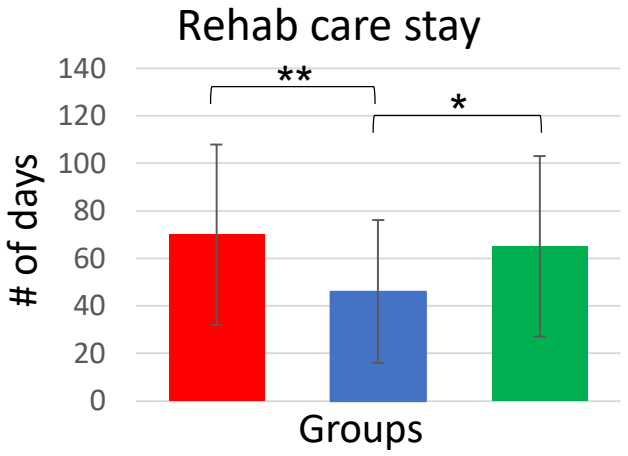
COVID+ COVID- pre-COVID

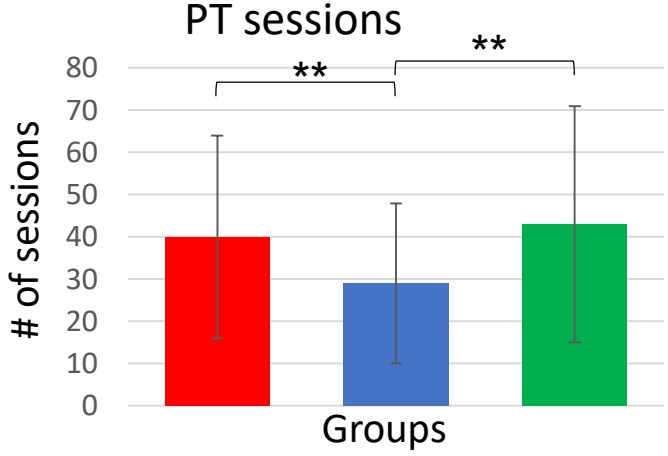
ns – not significant, *p<0.05, **p<0.001, test one-way Kruskal-Wallis non-parametric test
Multiple comparison post hoc Wilcoxon rank-sum test

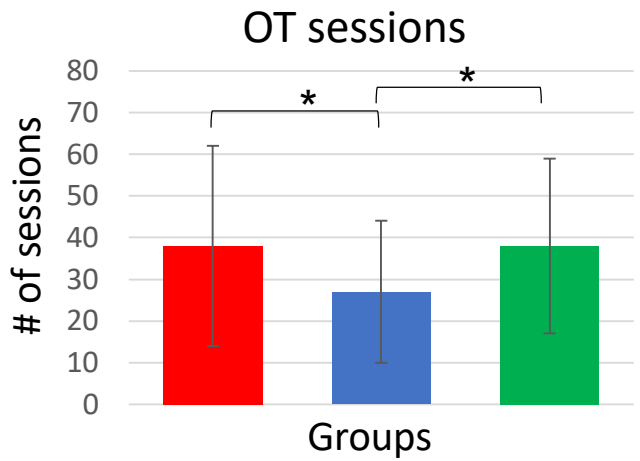
Comparison between the 3 groups - Rehab Care











ns – not significant, *p<0.05, **p<0.001, test one-way Kruskal-Wallis non-parametric test
Multiple comparison post hoc Wilcoxon rank-sum test

COVID+ COVID- pre-COVID

Preliminary Results

COVID+

- **More affected** at discharge (↓ FIM) even though it spent more time in rehabilitation and had ↑ OT/PT sessions compared to **COVID-** group.
- ↑ Length of stay in acute care and more patients required intensive (17%) and intubation care (9%) compared to **COVID-** & **pre-COVID** groups suggesting that **COVID+** individuals needed **more medical care** before being admitted to rehabilitation.

COVID-

- Trend to be **less affected** (↑ FIM) at admission than **COVID+** & **pre-COVID** patients.
- **Better outcomes** (↑ FIM) despite being provided with fewer rehab therapies (↓ OT/PT sessions) compared to **COVID+** & **pre-COVID** groups and discharged earlier from rehab centers compared to other 2 groups.

COVID+

=

pre-COVID

- **COVID+** group **resembled functional profile** of the **pre-COVID** group suggesting that a longer length of stay in rehab could have minimized the impact of having had COVID.

Future Plans

Future Plans

1. We expect 100 post-stroke individuals to be included in our complete dataset.

2. More variables will be included such as the presence of comorbidities, relapse days & length of stay in intensive care.

3. Multiple linear regression models to estimate the influence of predictor variables on our primary outcome (FIM).

4. Knowledge Translation
   - Publication of results in a scientific journal
   - Presentation of results at each participating rehabilitation site
   - Participating in local, provincial, national and international conferences

5. Next Phase
   - Survey the views of users (patients) and stakeholders on the experience of care and unmet needs during rehabilitation.

Significance

Significance

1. This study will provide information on the:
   a. **influence of the COVID-19 on the rehabilitation care** of individuals admitted to a COVID-19 designated rehabilitation centers in the province of Quebec.
   b. **factors that had the most influence** on the rehabilitation potential (FIM score on admission) and recovery gains (FIM score at discharge)
2. Our study aligns with the "**Rehabilitation 2030**: a call for action" initiative by WHO (*Eur J Phys Rehabil Med, 2017).*
3. Our study will contribute to the elaboration of recommendations to develop efficient and **standardized rehabilitation protocols** in the advent of other pandemics.

Acknowledgements

Coordinators

- Carole Lavallée, Professional Practices Coordinator at VM
- Valérie Vigneault, Specialist in Clinical Activities (Interim), Coordinator at JRH

Research Assistants

- Aram Deyirmendjian at VM
- Virginia Cornea at VM
- Alicia Nguy at JRH

Fundings

- Nouvelles Initiatives grant from CRIR
- CRIR (2021) Master's student scholarship

CRIR
Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain

- Appel à projets ciblés sur la COVID-19 REPAR
- REPAR (2022) Master's student scholarship

REPAR
RÉSEAU PROVINCIAL DE RECHERCHE EN ADAPTATION-RÉADAPTATION


рахмат
danke
謝謝
ngiyabonga
teşekkür ederim
Баярлалаа
спасибо
dank je
thank you
gracias
tapadh leat
хвала
bedankt
hvala
maururu
mochchakkeram
dziękuję
go raibh maith agat
sukriya
kop khun krap
taiku
obrigado
sagolun
arigato
takk
dakujem
grazie
ありがとう
terima kasih
мерси
ευχαριστώ
감사합니다
merci