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Impact of COVID19 on Canadian Health Systems

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Development of an Implementation Framework to Advance Provincial and National Health System Supply Chain Management of the COVID-19 Pandemic

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Objectives:

1. Conduct a comparative analysis of provincial health system supply chain infrastructure and processes that support health services capacity to deliver care.
2. Measure the digital maturity of supply chain infrastructure to examine how digital maturity influences COVID-19 management and outcomes in Canadian provinces.
3. Review policy frameworks that support health services procurement, product sourcing and validation.
4. Examine the effectiveness of federal-provincial-territorial supply chain coordination.

Provinces: British Columbia, Alberta, Manitoba, Ontario, Quebec, Nova Scotia, Newfoundland and Labrador

METHODS

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Mixed Methods Case Study Design

* Qualitative interviews of key informants (n=120)
  - Public health leaders
  - Ministries of Health
  - Clinicians
  - Citizen advocates
  - Operational leaders, VP's
  - Supply Chain Teams

* Analysis of COVID19 outcomes data (CIHI) and supply chain data (where available) to examine impact of supply chain capacity on COVID19 outcomes

* (In Progress) Alberta Machine Learning Institute/Modeling team from Quebec, Ontario: predictive analytic tools to predict impact of public health strategies, PPE availability on COVID19 outcomes

CENTRALIZED VS DISTRIBUTED SUPPLY CHAIN STRATEGIES

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Alberta, BC, Manitoba, NL, NS

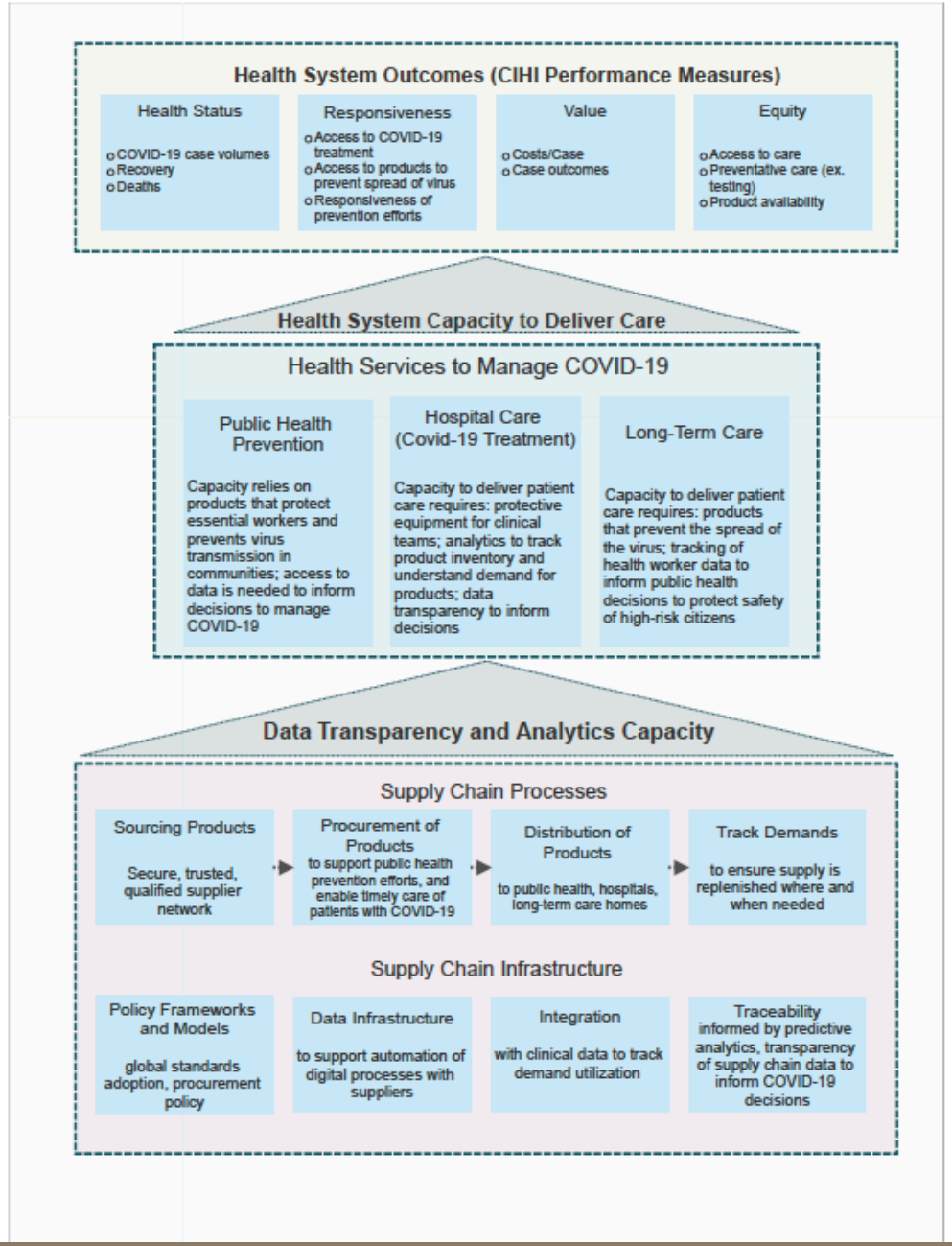
- Integrated supply chain agencies/models
- Coordinated and centralized procurement of supply for entire province
- Allocation of PPE based on established formulas to manage equity and access
- Long Term Care supplied with PPE by central agency
- Digital infrastructure to track supply inventory and utilization (Alta, Man.)
- BC and NL could manually pull data from RHA's to track inventory only.

VS

Ontario and Quebec

- No existing centralized agency/model to source products, manually counted PPE ("virtual inventory")
- Long Term Care was not included in PPE allocations, hospitals prioritized
- Community agencies, LTC suffered immediate PPE shortages along with 30% workforce absenteeism
- Intense competition across organizations to source PPE, "hoarding" behavior notable in hospitals.
- No data infrastructure available to track utilization of product.

CONCEPTUAL FRAMEWORK



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CIHI Data

Document Analysis

Key Informant Interviews

CIHI Data

Key Informant Interviews

Supply Chain Data

CRITICAL SUPPLY SHORTAGES

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Supply allocation prioritized to hospitals (Ontario and Quebec)

- PPE was conserved using allocation formulas – "hospitals 1st"
- Long term care, home care sourced PPE independently
- Access to provincial stockpile only during outbreak

Severe shortages in early phase (March-April)

- No pandemic stockpile available.
- Global race to source PPE, < 1% suppliers identified were viable.
- Provinces and Federal agencies led sourcing efforts independently.
- Quality of products inconsistent, not certified.

"Just in Time failed", leveraged existing networks to source new suppliers (domestic sourcing)

- Local businesses pivoted production of critical supplies (face shields, gowns)
- Legislation to overcome trade barriers to domestic suppliers (NL)

LEADERSHIP STRATEGY AND STRUCTURE

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- BC was highly integrated, well established Emergency Operations Committee that coordinated efforts, PHSA sourced and distributed PPE to RHA's, Public Health highly integrated in EOC and Ministry of Health.
- Alberta: Centralized governance (AHS), prioritized hospitals then expanded to communities. Public health teams in AHS, Chief Medical Officer of Health part of Ministry team, established supply chain strategy.
- Manitoba restructuring health system during pandemic, Winnipeg Regional HA supply chain team sourced and distributed PPE, now transitioning to new agency. Public Health integrated into provincial leadership for highly integrated strategy.
- Ontario restructuring underway (14 LHINS to 5 regions). Public Health distributed across 32 Health Units,. MEOC declared "Hospitals first" strategy, strategy tables led by Hospital CEO's, community care absent.
- "Atlantic Bubble": Regional approach, highly collaborative, centralized EOC leadership with PPE task forces, Public Health integrated into RHA operations, mobilized local business. Regional responsiveness to containment, tracing, domestic supplier strategy.

DIGITAL INFRASTRUCTURE

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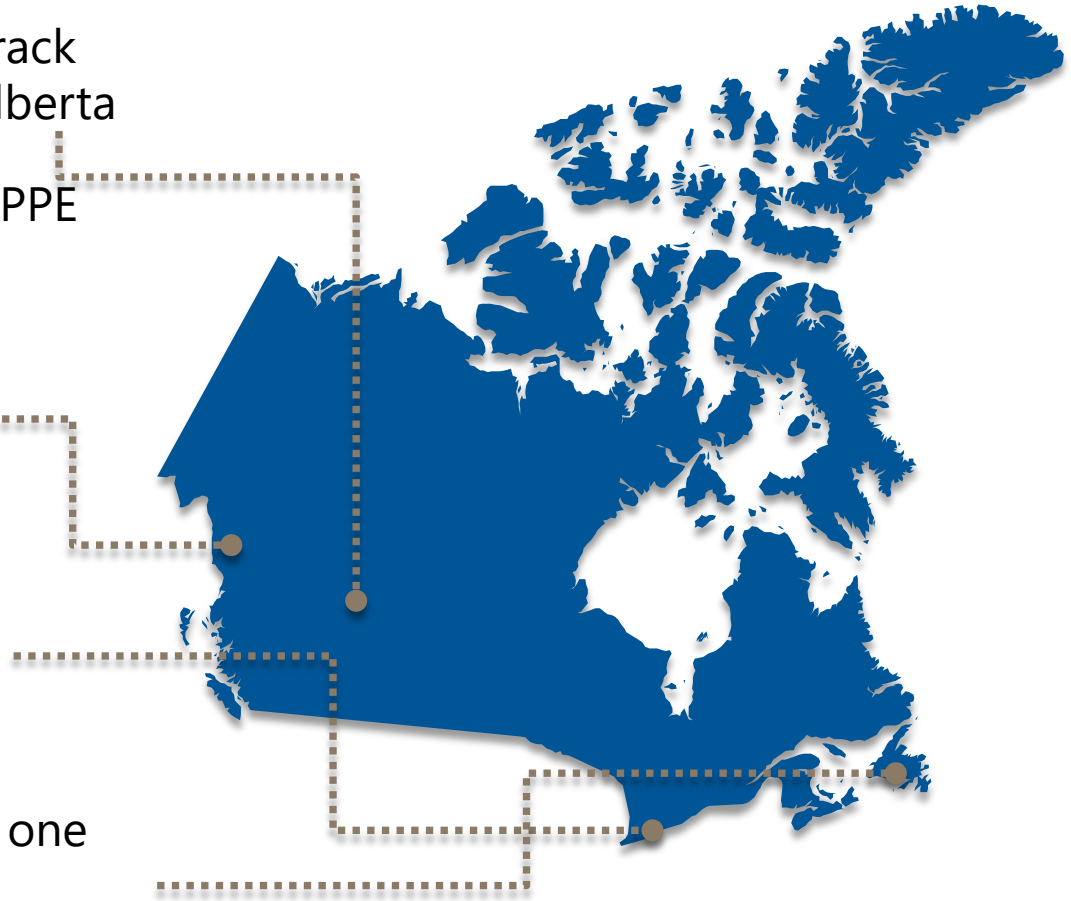
- Most provinces have no digital infrastructure able to track use of critical products such as PPE, the exception is Alberta
- Limited or no ability to accurately forecast demand of PPE supply and inventory needed for COVID19 surge
- BC was able to track distribution products to each regional health authority, no infrastructure to track utilization
- Ontario created a virtual inventory, organizations required to count manually and report supply of PPE daily
- Nova Scotia created a Tableau dashboard early in wave one
- NL: created a dashboard pulling data from 4 RHA data systems



OUTCOMES

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Workforce Impact Substantial

* Fear and Uncertainty: fear of contracting virus and bringing it home to their family; lack of confidence in safety of their workplace

* Panic: images of other jurisdictions on social media (NYC, Italy, Spain, Wuhan)

* PPE Directives changed frequently, allocation of PPE viewed as misaligned with IPAC practices (ex. Allocated one mask for entire shift vs. changing mask for every patient).

*. Transparency, clear and consistent communication associated with higher levels of confidence in their workplace, lower rates of absenteeism.

OUTCOMES

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Long Term Care

- In provinces where LTC was prioritized, PPE access was managed more effectively, LTC deaths and outbreaks less severe (NL, BC, NS)

Ontario and Quebec:

- “Hospitals first” policy resulted in LTC homes having to source their own PPE, no experience and no supplier networks to work with.
- LTC staff lacked knowledge of IPAC, cohorting, containment
- Provinces supplied LTC with 7 days of supplies, only “once outbreaks had been established”.
- Military called in, staffing shortages severe, residents suffered neglect
- Outbreaks continue as LTC homes continue to source PPE with no centralized supply chain strategy.
- Hospitals were assigned to “oversee” LTC in some locations to support
- SARS Outcomes virtually identical to COVID19 outcomes

OUTCOMES

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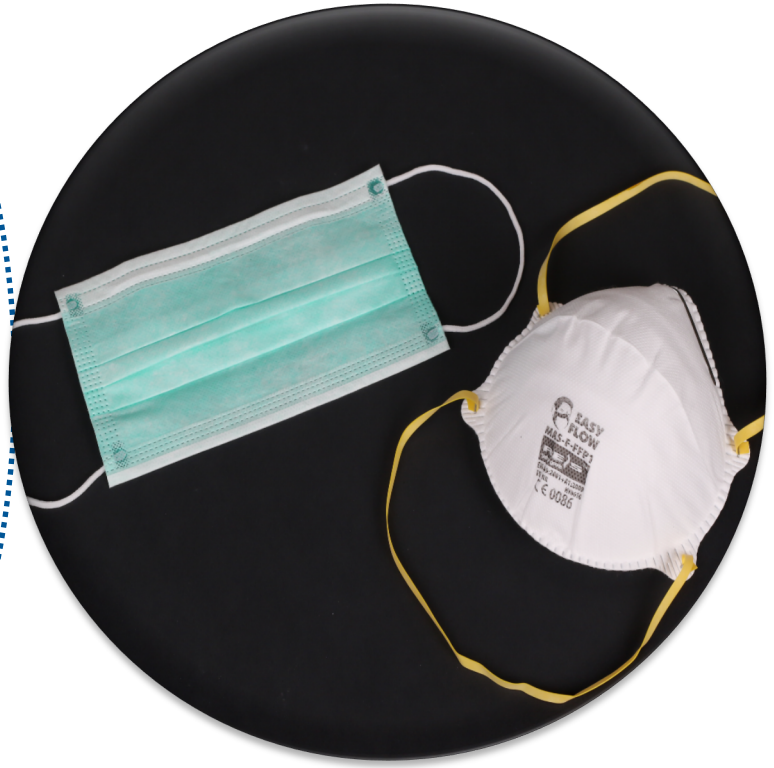
Supply Chain Strategy

- Stabilized supply at 180-300 days of inventory;
- Mobilization of domestic suppliers, sustainability of domestic suppliers unclear
- Data infrastructure remains under developed
- Product quality standards and certification based on US (e.g. NIOSH) standards, **no Canadian certification**
- GPO widely viewed as ”letting us down”
- Significant investment in warehouse and logistics, **pandemic stockpile**.
- The need for **greater redundancy** in the health supply chain and improved supply management with coordination across entire province.



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Cross Province Themes:

1. Transparency and meaningful engagement builds workforce Confidence.

2. Clarity of messaging, consistency of communication important

3. Politics vs. Public Health

4. Culture of Compliance vs. Culture of Collaboration (citizens, workforce)

5. Learning Health Systems

Next Steps

Supply chain capacity clearly linked to health of Canadians and capacity of health teams to deliver care.

- Cross Case Analysis of provincial case studies to create a framework for supply chain resilience
- Digital supply chain maturity assessments.
- Quantitative analysis of COVID19 outcomes ay under
- Analytics tools to predict and model supply chain capacity and outcomes, design and testing underway, with available data.
- Procurement policy frameworks analysis, in progress

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QUESTIONS?

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