

Program and service areas

**Public-health measures**

• **Infection prevention**

- Vaccination
  - Safety and efficacy of two doses of the same vaccine if two doses are recommended (or a single dose if a single dose is recommended)
  - Safety and efficacy of one dose of one vaccine and a second dose of a different vaccine (i.e., mix and match or heterologous prime and boost)
  - Safety and efficacy of one dose if two doses are recommended
  - Safety and efficacy of three doses if two doses were recommended before the emergence of variants
  - Real world effectiveness
  - Efficacy/effectiveness by population segment
  - Vaccine roll-out (see health-system arrangements)
  - Supporting discovery of a vaccine to prevent COVID-19 in general, and for specific population groups
- Personal protection
  - Washing hands
  - Wearing masks
  - Wearing personal protective equipment
  - Disinfecting surfaces and facilities
  - Physical distancing
  - Temporal distancing
  - Altering sexual activities
  - Public-focused behavior-change supports for the above
  - Health worker and essential worker-focused behaviour change supports for the above
  - Other
- Service limitations

• **Infection control**

- Screening
  - Targets
  - Methods
  - Locations (and frequency if applicable)

- Quarantining of exposed or potentially exposed individuals
  - Voluntary or imposed
- Testing
  - Optimizing testing across different types of individuals, settings and timing options
  - Methods used in the test
  - Methods (type of specimen)
  - Methods (site from where specimen is taken)
  - Speeding results
- Isolation of suspected or confirmed cases
- Contact tracing
- Susceptibility tracking
- Antibody testing
- Antibody test usage
- **Broader public-health measures**
  - Risk stratification
    - Stratifying the population by risk of infection
  - Outbreak management
    - Locations (essential services or others)
    - Rapid-response mechanisms
  - Pandemic tracking
    - Levels of re-emergence that trigger action

**Clinical management of COVID-19 and pandemic-related health issues**

• **Prophylaxis for COVID-19**

- Drugs to prevent severe COVID-19 infection

• **Clinical treatment of COVID-19**

- Assessing most important prognostic factors
- Screening and testing for COVID-19 (see public-health measures)
- Drugs to treat COVID-19
  - Anti-virals (see list of drugs)
  - Other antimicrobials (antibiotics, antimalarials, antiparasitics)

- Anti-inflammatories
- Kinase inhibitors
- Corticosteroids
- Biologics
- Others
- Blood products
  - Convalescent plasma
  - Hyperimmune immunoglobulin
- Ventilation for COVID-19
  - Invasive ventilation
  - Non-invasive ventilation
- Proning
- Other treatments for COVID-19
- Other aspects of critical care for COVID-19
  - Management of cardiovascular complications
  - Management of renal complications
  - Management of respiratory complications
  - Management of other complications
- Community-based treatment of COVID-19 and community-based home monitoring
- Complementary and alternative therapies

• **Management of COVID-19 with a syndemic orientation**

• **Treatment of post-COVID conditions**

- Treatment of long COVID-19 symptoms
- Treatment of multiorgan effects
- Treatment of the effects of COVID-19 treatment or hospitalization
- Treatment of COVID-19 sequelae

• **Clinical management of pandemic-related impacts**

- Interrupted management of other types of urgent care
- Interrupted management or poor self-management of chronic conditions
- Management of COVID-19 alongside other infectious diseases
- Management considerations for chronic and other existing health conditions
  - Chronic conditions

- Cancer
- Other conditions
- Burn-out and trauma in essential workers
  - Psychological support
  - Burn-out care
  - Trauma-informed care
- Mental health and addiction issues related to the pandemic response
  - Remote management of existing conditions
  - Management of pandemic-related mental health conditions
- Reproductive care for patients with COVID-19
  - Antenatal care
  - Childbirth
  - Post-partum care
  - Newborn care
  - Contraception
  - Termination services
- Domestic and gender-based violence related to the pandemic response (see economic and social responses)

• **Health promotion more generally**

- Eating healthy food
- Avoiding or minimizing unhealthy behaviours like smoking or excessive alcohol intake
- Remaining physically active
- Staying socially connected

**Health-system arrangements**

• **Cross-cutting system arrangements**

- Approach to COVID-19 vaccine roll-out
  - Securing and distributing a reliable supply of vaccines and ancillary supplies
  - Allocating vaccines and ancillary supplies equitably
  - Communicating vaccine-allocation plans and the safety and effectiveness of vaccines

- Administering vaccines in ways that optimize timely uptake
- Surveillance, monitoring, evaluation and reporting
- Approach to population-health management for COVID-19 and for those whose care is disrupted by COVID-19
  - Segmenting the population into groups with shared health and social needs
  - Re-designing care pathways and in-reach and out-reach services
  - Addressing barriers to implementation of pathways and services
  - Addressing cultural safety in the implementation of pathways and services
  - Maintaining gains made in population-health management (e.g., population segmentation, virtual care) and spreading and scaling them

• **Delivery arrangements**

- Overall service planning for COVID-19 preventing and treatment
  - Leveraging existing health-system arrangements
- Service planning for COVID-19 prevention
  - Changing emergency-medical service procedures (ambulances, paramedics)
  - Re-locating hospital-based ambulatory clinics, cancer treatments, etc.
  - Limiting access to health facilities
  - Changing hospital-discharge procedures
  - Changing long-term care procedures
  - Changing home and community care procedures
- Service planning for COVID-19 treatment
  - Scaling up/down testing capacity
  - Scaling up/down emergency-room capacity
  - Scaling up/down ICU capacity
  - Scaling up/down post-ICU recovery capacity (e.g., hospital beds)
  - Scaling up/down palliative-care capacity
  - Scaling up/down COVID-19 sequelae-management capacity

## Program and service areas

- Scaling up/down capacity to manage the pandemic-related impacts on health more generally (e.g., mental health and addictions)
- Surge-management models
- Triage protocols
- Infection prevention and control measures in health facilities
- Death certification
- Handling dead bodies
- Service planning for the ongoing management of other conditions
  - Changing acute care surgery and trauma-care procedures
  - Changing cancer-treatment procedures
  - Changing reproductive care
  - Delaying return visits, elective procedures, etc.
- Infrastructure planning and resource allocation
  - Personal protective equipment (under shortage conditions), including N95 respirators for health workers
  - Ventilators for sick COVID-19 patients
  - Medications and other technologies (under shortage conditions due to disrupted supply chains)
  - Remote monitoring
  - Virtual visits
- Workforce planning (including workforce shortages management) and development
  - Recruitment
  - Role extensions
  - Training in new procedures
  - Replacements when sick
  - Re-deployment
  - Supports to unpaid caregivers
  - Volunteer engagement
  - Self-management supports

- Service planning for 'return to normal'
  - Sequencing of services re-starting, by sector, conditions, treatments (including diagnostics), and populations
  - Wait-lists management
- **Financial arrangements**
  - Financing health services
  - Funding organizations
  - Remunerating providers
    - New or adjusted fee codes for virtual care
    - Income replacement when virtual care is not possible (at the same scale)
  - Purchasing products and services
- **Governance arrangements (who can make what decisions)**
  - Consumer and stakeholder involvement
  - Professional authority
    - Licensure changes to accommodate out-of-jurisdiction or retired health workers
  - Commercial authority
    - Technology approvals, public-private partnerships
  - Organizational authority
    - Limits of number of staff sent in
    - Ownership

### Economic and social responses

- **Children and youth services**
- **Citizenship**
  - Community engagement
  - Civil-rights violations
  - Elections

- **Climate action**
  - Climate-action focused economic stimulus
- **Community and social services**
  - Shopping and other services for socially isolated individuals
  - Religious services restrictions (e.g., church, mosque or synagogue)
  - Supports for community resilience
- **Culture and gender**
  - Stigma reduction
  - Domestic and gender-based violence reduction
  - Arts and cultural institutions
  - Religious institutions and practices
- **Economic development and growth**
  - Economic resilience
  - Targeted support to most affected industries
  - Interest rate reductions
  - Interest-free or -reduced loans to businesses
  - Revolving credit lines
  - Corporate bond buying (by government)
  - Government bond buying (by central banks)
  - Rent relief for businesses (by government)
  - Debt relief for businesses (by government)
  - Debt relief for governments (e.g., by IMF)
  - Tax deferral for businesses
- **Education**
  - Online instruction
  - Student supports
  - Instructor supports
  - Classroom changes

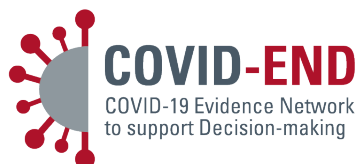
- School changes
- Skill re-development programs
- Service planning for 'return to normal'
- **Employment**
  - Worker supports
  - Workplace changes
  - Building changes
  - Service planning for 'return to normal'
- **Energy supply**
- **Environmental conservation**
  - Fire bans due to limitations in and risk for fire-fighting personnel
- **Financial protection**
  - Income replacement
  - Wage subsidies for essential workers
  - Rent deferral for citizens
  - Debt relief for citizens
  - Tax deferral for citizens
  - Financial-scam prevention
  - Broader consumer protection
- **Food safety and security**
  - Agricultural processes
  - Food processing plant design
  - Food transportation adjustments
  - Food shopping changes
  - Household food security
  - Food handling practices
- **Government services**
  - Transitioning to e-services
- **Housing**
  - Homeless shelters
  - Other congregate living environments
  - Housing alternatives when quarantine or physical distancing is needed

- **Infrastructure**
  - Broadband internet access Cyber-security protocols for governments and businesses (see financial protection for protecting citizens from financial scams)
  - Green-space re-allocations to accommodate physical distancing
  - Road-space re-allocations to accommodate physical distancing
  - Domestic production capacity for critical supplies
- **Natural resources**
  - Price collapses
  - Distribution difficulties
- **Public safety and justice**
  - Curfews
  - Enforcement of public-health measures
  - Public demonstrations
  - Police work in pandemics
  - Prisons
- **Recreation**
  - Public spaces like parks
  - Private spaces like gyms
- **Transportation**
  - Quarantining travellers
  - Public transportation rules
  - Private transportation restrictions
  - Tourism planning for 'return to normal'

Lavis JN. COVID-END taxonomy of public-health measures, clinical management of COVID-19, health-system arrangements, and economic and social responses. Hamilton, Canada: McMaster Health Forum, 2021.

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