

COVID-END taxonomy of COVID-19 public-health measures, clinical management, health-system arrangements, and economic and social responses

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
 - Effectiveness when administered at large scale
 - Efficacy/effectiveness by population segment
 - Complementary vaccines
 - 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

• 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
- Susceptibility tracking
 - Antibody testing
 - Antibody test usage
- Contact tracing

• 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
- Drugs to treat COVID-19

- 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 on health more generally

- 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

• 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

<ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ▪ Recruitment ▪ Role extensions ▪ Training in new procedures ▪ Replacements when sick ▪ Re-deployment ▪ Supports to unpaid caregivers ▪ Volunteer engagement ▪ Self-management supports 	<ul style="list-style-type: none"> ○ Service planning for 'return to normal' <ul style="list-style-type: none"> ▪ Sequencing of services re-starting, by sector, conditions, treatments (including diagnostics), and populations ▪ Wait-lists management ● Financial arrangements <ul style="list-style-type: none"> ○ Financing health services ○ Funding organizations ○ Remunerating providers <ul style="list-style-type: none"> ▪ 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) <ul style="list-style-type: none"> ○ Consumer and stakeholder involvement ○ Professional authority <ul style="list-style-type: none"> ▪ Licensure changes to accommodate out-of-jurisdiction or retired health workers ○ Commercial authority <ul style="list-style-type: none"> ▪ Technology approvals, public-private partnerships ○ Organizational authority <ul style="list-style-type: none"> ▪ Limits of number of staff sent in ▪ Ownership <p>Economic and social responses</p> <ul style="list-style-type: none"> ● Children and youth services ● Citizenship <ul style="list-style-type: none"> ○ Community engagement ○ Civil-rights violations ○ Elections 	<ul style="list-style-type: none"> ● Climate action <ul style="list-style-type: none"> ○ Climate-action focused economic stimulus ● Community and social services <ul style="list-style-type: none"> ○ Shopping and other services for socially isolated individuals ○ Religious services restrictions (e.g., church, mosque or synagogue) ○ Supports for community resilience ● Culture and gender <ul style="list-style-type: none"> ○ Stigma reduction ○ Domestic and gender-based violence reduction ○ Arts and cultural institutions ○ Religious institutions and practices ● Economic development and growth <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> ○ Online instruction ○ Student supports ○ Instructor supports ○ Classroom changes 	<ul style="list-style-type: none"> ○ School changes ○ Skill re-development programs ○ Service planning for 'return to normal' ● Employment <ul style="list-style-type: none"> ○ Worker supports ○ Workplace changes ○ Building changes ○ Service planning for 'return to normal' ● Energy supply ● Environmental conservation <ul style="list-style-type: none"> ○ Fire bans due to limitations in and risk for fire-fighting personnel ● Financial protection <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> ○ Agricultural processes ○ Food processing plant design ○ Food transportation adjustments ○ Food shopping changes ○ Household food security ○ Food handling practices ● Government services <ul style="list-style-type: none"> ○ Transitioning to e-services ● Housing <ul style="list-style-type: none"> ○ Homeless shelters ○ Other congregate living environments ○ Housing alternatives when quarantine or physical distancing is needed 	<ul style="list-style-type: none"> ● Infrastructure <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> ○ Price collapses ○ Distribution difficulties ● Public safety and justice <ul style="list-style-type: none"> ○ Curfews ○ Enforcement of public-health measures ○ Public demonstrations ○ Police work in pandemics ○ Prisons ● Recreation <ul style="list-style-type: none"> ○ Public spaces like parks ○ Private spaces like gyms ● Transportation <ul style="list-style-type: none"> ○ Quarantining travellers ○ Public transportation rules ○ Private transportation restrictions ○ Tourism planning for 'return to normal'
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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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