

Appendix

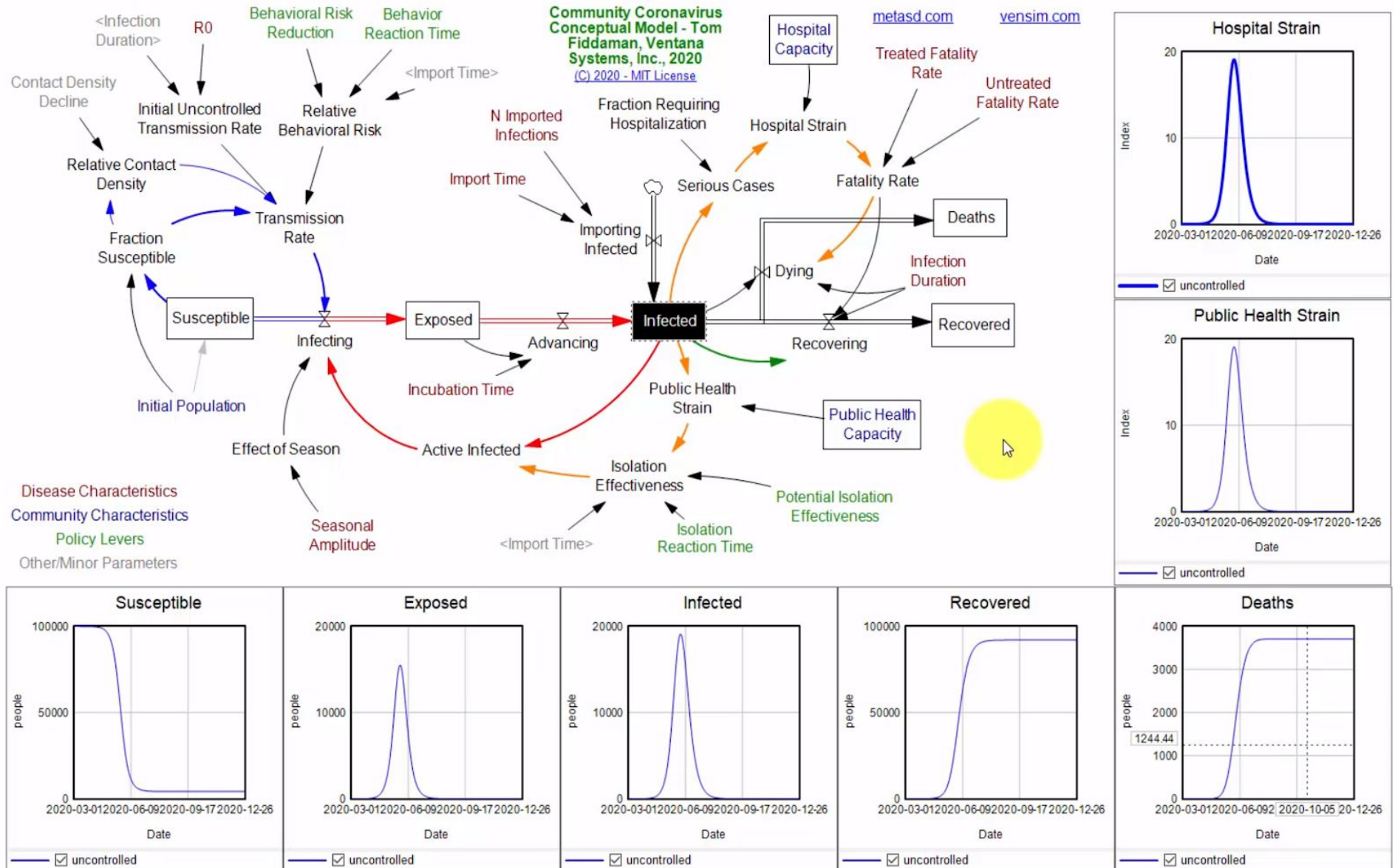


Figure 1. Corona system dynamics model, Tom Fiddaman

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FIGURE. Preparedness and response framework for novel influenza A virus pandemics: CDC intervals

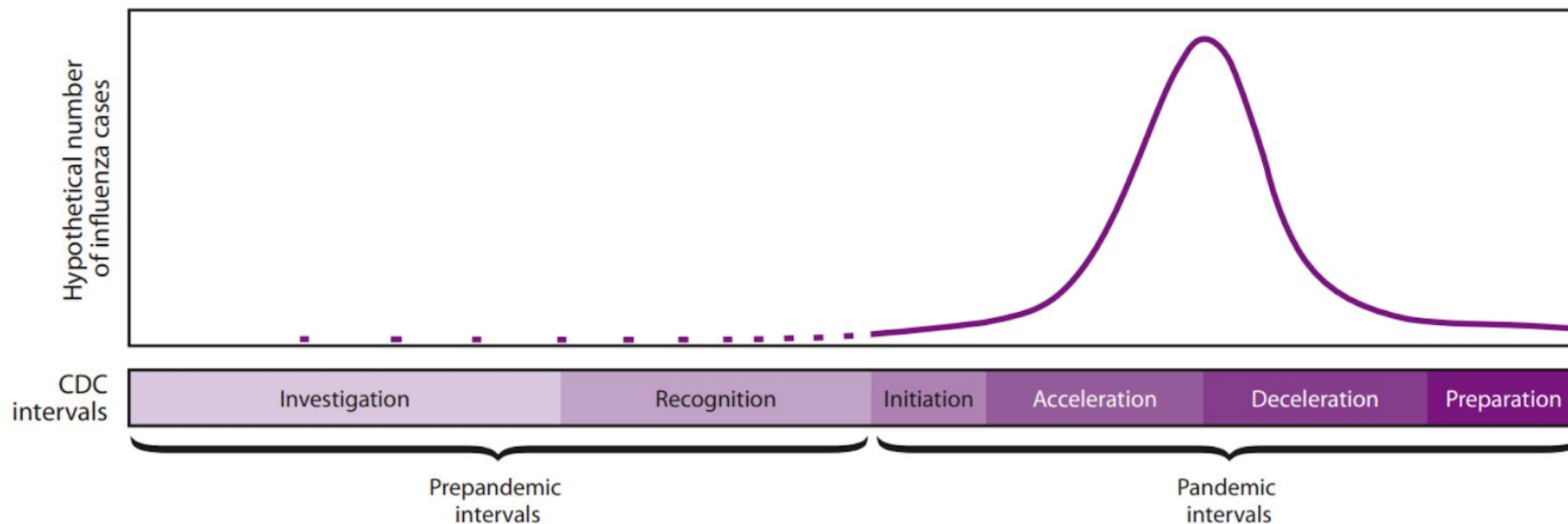


Figure 2. CDC’s Preparedness and Response Pandemic Interval Framework

Table 1. CDC’s Pandemic Interval Framework and DOH’s Pandemic Alert System adapted to LGUs

Interval	Investigation	Recognition	Initiation	Acceleration	Deceleration	Preparation
CDC Indicator	Identification of a single imported COVID 19 case in the province	Increasing numbers of imported COVID 19 cases province-wide but no local transmission in the LGU	Sustained local transmission within the LGU	Consistently increasing rate of COVID 19 cases in the LGU indicating established transmission	Consistently decreasing rate of COVID 19 cases in the LGU	No COVID 19 cases in the province

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DOH Alert Level	Level 1: White	Level 2 and 3: Blue	Level 4: Red			
DOH Indicator	Suspect or case identified outside the province	<p>Level 2: Imported case of COVID-19 infection is reported inside the province</p> <p>Level 3: WHO declaration of Public Health Emergency of International Concern (PHEIC)</p>	Local transmission is reported within the LGU			
Key Actions	<p>Preparation</p> <p>Protocol review</p> <p>Risk communication</p> <p>Surveillance</p> <p>Update health facilities on infection-control measures and CPGs</p> <p>Coordination with province</p>	<p>Activation of task force</p> <p>Preparation</p> <p>NPIs advocacy</p> <p>Risk communication</p> <p>Update health facilities</p> <p>Assess medical surge capacity</p> <p>Surveillance</p> <p>Coordinate with PHO and provincial hospital</p>	<p>Selective contact tracing</p> <p>Testing of high-risk groups</p> <p>Epidemiologic surveillance</p> <p>NPI enforcement</p> <p>Quarantine of close contacts</p> <p>Address surge capacity</p> <p>Risk communication</p> <p>Whole-of-society response</p>	<p>Severe disease and syndromic surveillance</p> <p>Testing of a sample of cases</p> <p>Expand and monitor effectiveness of community mitigation</p> <p>Address impact of community mitigation</p> <p>Respond to surge of healthcare needs</p> <p>Prepare for mortuary surge</p>	<p>Adjust response activities to be proportional to situation</p> <p>Severe disease and syndromic surveillance</p> <p>Monitor epidemic curve</p> <p>Testing of a sample of cases</p> <p>Assess and plan for targeted cessation of community mitigation</p> <p>Initiate targeted cessation of surge</p>	<p>Deactivation of EOC</p> <p>Create an after-action report</p> <p>Case confirmation to detect next wave</p> <p>Begin interpandemic surveillance</p> <p>Continue to promote community mitigation measures</p> <p>Replenish medical care stockpiles</p> <p>Risk</p>

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				Risk communication - what is being done, preparedness steps for partners Regional and provincial coordination	capacity strategies Risk communication - prepare for additional pandemic waves	communication - prepare for additional pandemic waves
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Table 2. Adapted Pandemic Interval Framework with WHO, CDC and DOH adaptation

WHO Pandemic Phase	CDC Pandemic Intervals	CDC Indicator (or Trigger)	DOH alert level	DOH Indicator (or Trigger)
Interpandemic phase: Period between influenza pandemics	1. Investigation	Identification of a single imported COVID 19 case in the region	Alert Level 1: White	Suspect or case identified outside the Philippines
Alert phase: Influenza caused by a new subtype has been identified in humans	DOH Action plans	Containment actions: <ul style="list-style-type: none"> • Coordination with DFA and embassies, • Strengthening of surveillance at points of entry and quarantine; • Review of protocols for detection, case management and referral based on previous experiences; Mitigation actions: <ul style="list-style-type: none"> • Preparation of laboratories and referral hospitals; • Preparation of essential medicines, PPEs, and equipment; • Risk communication focused on individual, household and public awareness; • Convening of inter-agency Technical Working Group 		

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	<p>Supplemental plans, CDC</p>	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Incident management <ul style="list-style-type: none"> ○ Review state/local response plans. ● Surveillance and epidemiology <ul style="list-style-type: none"> ○ Implement case-based investigation of novel influenza infections in humans and animals. ○ Assess contacts of ill persons to determine human-to-human transmission and risk factors for infection. ○ Report cases according to the Nationally Notifiable Diseases Surveillance System. ○ Identify whether state or federal assistance is required to support surveillance systems, field investigation, laboratory, and animal control resources. ● Laboratory <ul style="list-style-type: none"> ○ Assess and optimize laboratory capacity to detect and characterize influenza cases. ○ Identify whether state or federal assistance is required to support laboratory activities. <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Community mitigation <ul style="list-style-type: none"> ○ If human-to-human transmission is suspected, consider recommending isolation of ill persons and voluntary quarantine of close contacts (e.g., household members). ○ Enhance all usual influenza pandemic preparedness activities with schools and businesses. ● Medical care and countermeasures <ul style="list-style-type: none"> ○ Based on current recommendations, distribute health advisory notices with information on case definitions and infection-control measures to hospitals and outpatient care centers.
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		<ul style="list-style-type: none"> ○ If human-to-human transmission is suspected, monitor and assist with early access to post exposure chemoprophylaxis for case contacts per current recommendations. ○ Review all guidance documents, update as needed for the situation, and communicate with key stakeholders. ● Vaccine <ul style="list-style-type: none"> ○ Update of vaccine distribution and administration plans, process for rapid contract negotiation and staffing, mechanisms to identify and provide vaccine and document vaccination for critical infrastructure personnel and other possible priority groups for vaccination, and plans and staffing for mass vaccination clinics and points of dispensing. ○ Review all guidance documents, update as needed for the situation, and communicate to key stakeholders. ● Risk communication <ul style="list-style-type: none"> ○ Share information with key federal and local partners, such as animal and human health public affairs officers and other agencies or organizations. ● State/Local coordination <ul style="list-style-type: none"> ○ Provide technical assistance as appropriate to regional and local partners for reviewing plans, guidance, and communication channels. 		
	<p>2. Recognition</p>	<p>Increasing numbers of imported COVID 19 cases but no local transmission in the region</p>	<p>Alert Level 2 and 3: Blue</p>	<p>Level 2: Imported case of COVID-19 infection is reported inside the country</p> <hr/> <p>Level 3: WHO declaration of Public Health Emergency of International Concern (PHEIC)</p>

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	<p>DOH Action plans</p>	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Activation of inter-agency task force on Emerging Infectious Diseases (EIDs) ● Enhanced collaboration with different agencies and stakeholders ● Active monitoring of flights from affected countries and enforcement of Health Declaration Checklist ● Established guidelines for COVID-19 surveillance ● Established set-up for COVID-19 testing and subsequent development of in-house capacity <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Preparation and capacitation of referral hospitals; Triage and isolation and management in health facilities ● Intensification of standard infection prevention and control in health facilities ● Inventory, procurement, repositioning and augmentation of PPEs, supplies and equipment ● Non-pharmaceutical interventions <ul style="list-style-type: none"> ○ Personal hygiene; Travel restriction; Home quarantine; Isolation of cases; Social distancing ● Intensified risk communication and community engagement campaign focused on individual, household, and public awareness
	<p>Supplemental plans, CDC</p>	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Incident management <ul style="list-style-type: none"> ○ Forecast future resource needs for a potential response. ● Surveillance and epidemiology <ul style="list-style-type: none"> ○ Report cases according to the Nationally Notifiable Diseases Surveillance System. <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Community mitigation

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		<ul style="list-style-type: none"> ○ Respiratory etiquette, hand hygiene, and infection control. ○ Use of face masks, temporary closure of child care facilities and schools, and social distancing measures. ● Medical care and countermeasures <ul style="list-style-type: none"> ○ Consider implementation of voluntary contact chemoprophylaxis based on current recommendations. ○ Educate clinicians about recommended treatment, prophylaxis, and infection-control guidelines. ○ Initiate contact with coordinators of the local or regional (or both) Strategic National Stockpile (SNS) regarding the potential receipt and distribution of SNS countermeasures, as appropriate. ○ Assess impact on medical care facilities; Identify whether medical resources are sufficient to manage ill persons and conduct case-based control efforts; determine if federal assistance is required. ● Vaccine <ul style="list-style-type: none"> ○ Consider enrolling adult, obstetrical, and pediatric health-care providers, including pharmacies, to promote vaccine access to persons in all indicated age and risk groups and ability to identify and vaccinate critical infrastructure personnel. ○ Ensure that all identified vaccinators are authorized, and review policies and procedures regarding identification, authorization and training of nontraditional vaccinators. ○ Confirm vaccine providers have access to the immunization information system (IIS) or alternative systems. ○ Review capacity and capabilities of IIS for use by vaccine providers and in mass vaccination clinics for the required dosing schedule anticipated ● Risk communication <ul style="list-style-type: none"> ○ Disseminate risk communication messages, including what is known, what is not known, and what is being done by public health officials.
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		<ul style="list-style-type: none"> ○ Disseminate messages for travelers ○ Conduct briefings with local, regional, and state response partners, businesses, tribes, and health-care facilities on the potential for escalation, response actions underway, and preparedness steps that partners should consider. 		
Global spread of human influenza Pandemic phase:caused by a new subtype	3. Initiation	Sustained local transmission within the region	Alert Level 4: Red	Local transmission is reported
	DOH Action plans	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Expansion of inter-agency membership to include other instrumentalities of the government ● Selective contact tracing ● Testing and management to prioritize vulnerable and high-risk groups ● Monitoring of disease trends <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Strict enforcement of non-pharmaceutical interventions ● Implementation of mitigation guidelines ● Ensuring back-up systems to address surge capacity ● Sustained level of public awareness, to minimize fear, reduce anxiety and unrest ● Sustained inter-agency, multi-level whole-of-society coordination and response 		
	Supplemental plans, CDC	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Incident management <ul style="list-style-type: none"> ○ Consider activation of state/local emergency operations center. ○ Consider declaring a public health emergency. ● Surveillance and epidemiology 		

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		<ul style="list-style-type: none"> ○ Consider surveillance for hospitalizations and deaths if not already a component ● Laboratory <ul style="list-style-type: none"> ○ Continue to confirm all suspected cases resources permitting; prepare a plan for limiting testing using surveillance criteria. <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Community mitigation <ul style="list-style-type: none"> ○ Use Pandemic Severity Assessment Framework (PSAF) to determine the impact of the pandemic based on clinical severity and transmissibility ● Medical care and countermeasures <ul style="list-style-type: none"> ○ Review and prepare to deploy a mortuary surge (mass mortality) plan. ○ Consider deployment of state/local caches. ○ Consider implementation of voluntary quarantine of contacts and chemoprophylaxis of exposed persons based on current recommendations. ● Vaccine <ul style="list-style-type: none"> ○ Implement stockpiled pandemic vaccination campaigns if a stockpiled pandemic vaccine is available, ○ Update the distribution plan based on CDC prioritization plan 	
	<p>4. Acceleration</p>	<p>Consistently increasing rate of COVID 19 cases in the region indicating established transmission</p>	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Incident management <ul style="list-style-type: none"> ○ Maintain processes to monitor effectiveness of response. ● Surveillance and epidemiology <ul style="list-style-type: none"> ○ If affected, transition surveillance from individual case confirmation to severe disease and syndromic surveillance as appropriate.

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			<ul style="list-style-type: none"> ○ If unaffected, continue individual case confirmation. ○ Monitor for changes in epidemiology. ● Laboratory <ul style="list-style-type: none"> ○ Provide laboratory confirmation of only a sample of cases as required for virologic surveillance. ○ Implement revised specimen submission protocol per CDC guidance as appropriate. <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Community mitigation <ul style="list-style-type: none"> ○ Consider activating (if not already implemented) or expanding (if already implemented) appropriate community mitigation measures for affected communities (such as temporary closure of child care facilities and schools, school and workplace social distancing measures, and postponement or cancellation of mass gatherings). ○ Monitor effectiveness of community mitigation measures. ○ Monitor adverse impact of community mitigation measures on society, and coordinate with local response agencies to address the impact if possible. ● Medical care and countermeasures <ul style="list-style-type: none"> ○ Monitor and respond to surge in health-care needs, including setting up alternative care sites. ○ Educate clinicians and the public about the need for prompt treatment of ill persons. ○ Review and prepare to deploy mortuary surge (or mass mortality) plan.
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			<ul style="list-style-type: none"> ○ Monitor antiviral use to identify possible shortages. ○ Consider deployment of state/local caches ● Vaccine <ul style="list-style-type: none"> ○ Implement vaccination campaigns if stockpiled pandemic or newly developed antigen-specific pandemic vaccine is available. ○ Monitor vaccination coverage levels and adverse events. ● Risk communication <ul style="list-style-type: none"> ○ Disseminate updated risk messages. ○ Share updated information regarding vaccine. ○ Continue to provide regular updates to partners, stakeholders, elected officials, and the media. ● State/Local coordination <ul style="list-style-type: none"> ○ Continue to coordinate with all partners. ○ Support maintenance of critical infrastructure and key resources as appropriate.
	<p>5. Deceleration</p>	<p>Consistently decreasing rate of COVID 19 cases in the region</p>	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Incident management <ul style="list-style-type: none"> ○ Continue actions described for the acceleration interval as appropriate. ○ Review plans, and evaluate whether response activities are proportionate to the situation. ● Surveillance and epidemiology <ul style="list-style-type: none"> ○ Continue severe disease and syndromic surveillance. ○ Monitor for changes in epidemiology. ● Laboratory

			<ul style="list-style-type: none"> ○ Provide laboratory confirmation of only a sample of cases as required for virologic surveillance. ○ Submit a sample of viruses or specimens to CDC per CDC guidance on revised specimen submission. <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Community mitigation <ul style="list-style-type: none"> ○ Assess, plan for, and implement targeted cessation of community mitigation measures if appropriate. ● Medical care and countermeasures <ul style="list-style-type: none"> ○ Initiate targeted cessation of surge capacity strategies as appropriate. ○ Maintain aggressive infection-control measures in the community. ● Vaccine <ul style="list-style-type: none"> ○ Continue vaccination response as appropriate. ● Risk communication <ul style="list-style-type: none"> ○ Disseminate updated risk messages. ○ Provide information on measures to prepare for and respond to possible additional pandemic waves. ● State/Local coordination <ul style="list-style-type: none"> ○ Continue to coordinate with all partners.
<p>Transition phase: Reduction in global risk, reduction in response activities, or progression toward recovery actions</p>	<p>6. Preparation</p>	<p>No COVID 19 cases in the region</p>	<p>Containment actions:</p> <ul style="list-style-type: none"> ● Incident management <ul style="list-style-type: none"> ○ Continue actions described for the deceleration interval as appropriate. ○ Consider deactivation of the state/local emergency operations center.

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			<ul style="list-style-type: none"> ○ Prepare for subsequent waves. ○ Create an after-action report to document lessons learned. ○ Consider suspending the public health emergency declaration. ● Surveillance and epidemiology <ul style="list-style-type: none"> ○ Continue case confirmation of selected cases to monitor progress of the pandemic and to detect acceleration to the next wave. ○ Begin conducting routine interpandemic surveillance. ● Laboratory <ul style="list-style-type: none"> ○ Return to routine interpandemic virologic surveillance. ○ Assess and optimize laboratory capacity. <p>Mitigation actions:</p> <ul style="list-style-type: none"> ● Community mitigation <ul style="list-style-type: none"> ○ Modify community mitigation measures as necessary. ○ Continue to promote community mitigation preparedness activities on standby for a subsequent wave. ● Medical care and countermeasures <ul style="list-style-type: none"> ○ Monitor medical surge trends. ○ Replenish stockpiles or caches as able. ○ Monitor antiviral dispensing and usage trends. ● Vaccine <ul style="list-style-type: none"> ○ Participate in vaccine recovery as appropriate.
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			<ul style="list-style-type: none">○ Continue to vaccinate, with a focus on hard-to-reach populations, in anticipation of a subsequent wave.● Risk communication<ul style="list-style-type: none">○ Disseminate updated risk messages, including information on measures to prepare for and respond to possible additional pandemic waves.● State/Local coordination<ul style="list-style-type: none">○ Continue to coordinate with all partners.
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Joint EpiMetrics-UPCPH-ASMPH COVID 19 Study Group

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