Social Distancing

April 8, 2020

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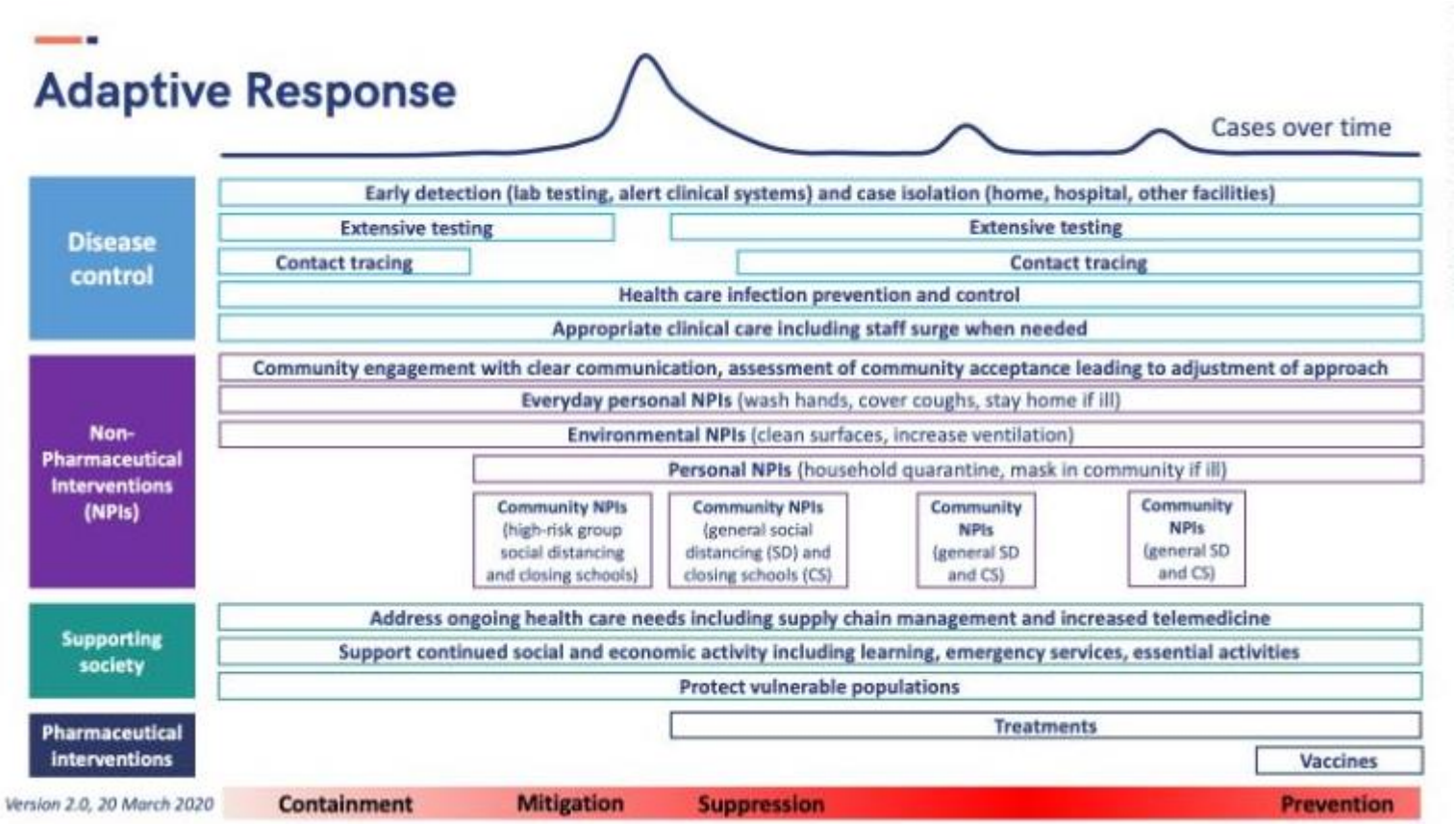
Overview: Adaptive Response



Source: Resolve to Save Lives

Community Interventions

- Workplace measures
- School closures
- Travel restrictions
- Restrict large gatherings
- Use of masks

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Rapid Expert Consultation on Social Distancing for the COVID-19 Pandemic (March 19, 2020) (2020)

DETAILS

26 pages | 8.5 x 11 | PAPERBACK

ISBN 978-0-309-67571-0 | DOI 10.17226/25753

Evidence from Influenza

- Workplace social distancing reduces peak attack rate. (Ahmed, 2018)

Workplace Social Distancing						
Effectiveness of workplace social distancing measures in reducing influenza transmission: a systematic review	Ahmed et al.	2018	BMC Public Health	Influenza	Systematic review of the evidence of effect on social distancing in non-healthcare workplaces (e.g., telecommute policies) to reduce or slow the transmission of influenza	• Social distancing in non-healthcare workplaces settings was associated with a reduction in ILI and seroconversion to H1N1, and delayed and reduced the peak attack rate • Effectiveness declined with higher basic reproduction number values, delayed triggering of social distancing, or lower compliance. • Important to note that these findings were primarily supported by modeling studies.

Source: NASEM

Evidence from Influenza

- School closing reduces and delays the spread of infection. (CDC, 2012)

Emergency preparedness and response: School dismissals to reduce transmission of pandemic influenza	CDC – Community Preventive Services Task Force	2012	N/A	Influenza (Pandemic)	CDC's Community Preventive Services Task Force, and evidence-based guidelines group, conducted a **systematic review** in 2012 of school dismissals to reduce transmission of pandemic influenza	• The Task Force recommended pre-emptive, coordinated school dismissals during a severe influenza pandemic (a pandemic with high rates of severe illness such as that experienced in 1918) based on sufficient evidence of effectiveness in reducing or delaying the spread of infection and illness within communities. • This recommendation was based on findings of assessments of measures taken during the 1918 pandemic and modeling studies that indicated that benefits of timely, coordinated, and sustained dismissals outweigh the expected societal and economic costs.

Source: NASEM

Evidence from Influenza

- Travel restrictions allow for modest delay and reduce incidence by 3% (Mateus, 2014)

Effectiveness of travel restrictions in the rapid containment of human influenza: a systematic review	Mateus et al.	2014	Bulletin World Health Organization	Influenza	Systematic review to assess evidence for restrictions in travel affecting the spread of influenza.	• Internal travel restrictions and international border restrictions delayed the spread of influenza epidemics by one week and two months, respectively. • International travel restrictions delayed the spread and peak of epidemics by periods varying between a few days and four months • Travel restrictions reduced the incidence of new cases by less than 3%. • Impact was reduced when restrictions were implemented more than six weeks after the notification of epidemics or when the level of transmissibility was high. • Travel restrictions would have minimal impact in urban centers with dense populations and travel networks. • No evidence that travel restrictions would contain influenza within a defined geographical area. • Extensive travel restrictions may delay the dissemination of influenza but cannot prevent it

Source: NASEM

Evidence from Influenza

Dormitories at the University of Michigan were randomized to different interventions. Compared to control, dormitories with extra hand hygiene and face masks had substantial reductions up to 75% in influenza-like illness. (Aiello, PLOS One, 2010)

Evidence from COVID

- Singapore intense surveillance and individual containment has contributed to linear rather than exponential spread (Lee 2020).

Interrupting transmission of COVID-19: lessons from containment efforts in Singapore	Lee et al.	2020	N/A (pre-print)	COVID-19	Observational review / lessons learned from Singapore	• Despite multiple importations resulting in local chains of transmission, Singapore has been able to control the COVID-19 outbreak without major disruption to daily living. • Strategy of using a comprehensive surveillance system to detect as many cases as possible, and to contain them at the individual level • This strategy, coupled with community-based measures proportionate to the transmission risk, has been effective in containing spread, and could be considered in countries in the early stages of the outbreak where it is not possible to mount massive community-wide containment efforts.

Source: NASEM

Evidence from COVID

- In Wuhan, non-pharmaceutical interventions reduced R0 from 3.86 to 0.32. (Wang 2020)

Evolving epidemiology and impact of non-pharmaceutical interventions on the outbreak of Coronavirus disease 2019 in Wuhan, China	Wang et al.	2020	N/A (pre-print)	COVID-19	Epidemiological case study from Wuhan, China	• From December 8, 2019 – January 23, 2020 there was unabated spread and no social distancing measures (R_t of 3.86). • From January 23, 2020 – February 2, 2020, the following social distancing measures were implemented: home quarantine for suspected cases, cordon sanitaire, public transportations suspension, closure of entertainment venues and public spaces, compulsory wearing facemasks, personal hygiene, and body temperature self-monitoring (R_t of 1.26). • From February 2, 2020 and on, cordon sanitaire, public transportations suspension, closure of entertainment venues and public spaces remained but the following measures were also implemented: centralized isolation in designated hospitals, mobile-cabin hospitals, schools, and hotels, universal and strict stay-at-home policy for all residents unless permitted, universal temperature and symptom monitoring, universal screening and reporting (R_t of 0.32). • The interventions were estimated to prevent 94.5% (93.7 to 95.2%) infections until February 18.

Source: NASEM

Community Interventions During Periods of Peak Population Risk

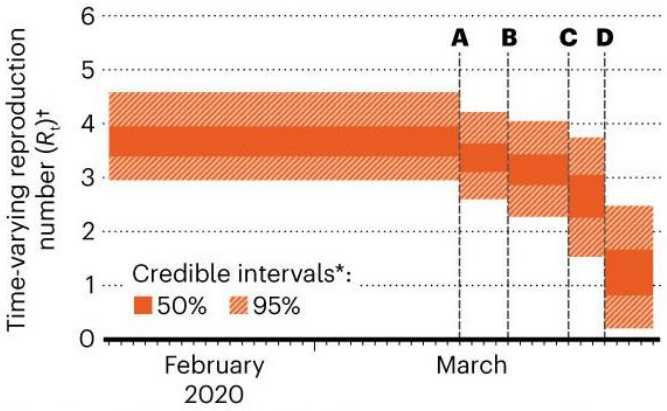
- ✓ Workplace measures
- ✓ School closures
- ✓ Travel restrictions
- ✓ Restrict large gatherings
- ✓ Use of masks

Estimates from Imperial College

LOCKDOWNS KEEP INFECTIONS AT BAY

UK interventions reduced the virus's effective reproduction number — the average number of people an infected person passes the disease to — from almost four to around one, a model from Imperial College London says.

A: Self-isolation **B:** Social distancing **C:** School closure
D: Public events banned and complete lockdown



*Bayesian statistics: interval within which unobserved parameter falls, with particular probability.
†R_t: average number of infections, at time t, per infected individual over the course of their infection. If R_t is maintained at <1, new infections decrease, resulting in control of the epidemic.

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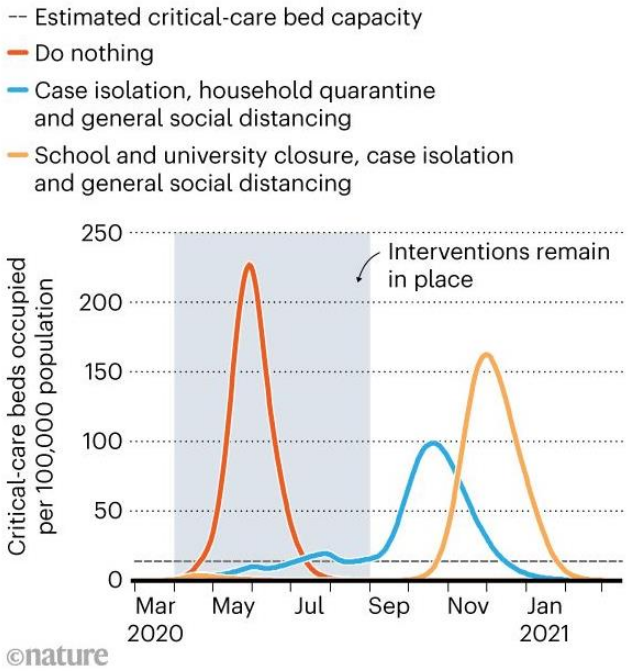
A SECOND WAVE

In the United States, implementing measures to contain the virus could stop people with COVID-19 from immediately overwhelming the country's critical-care hospital-bed capacity, a simulation from Imperial College London suggests. But a second wave of the pandemic might be expected later in the year.



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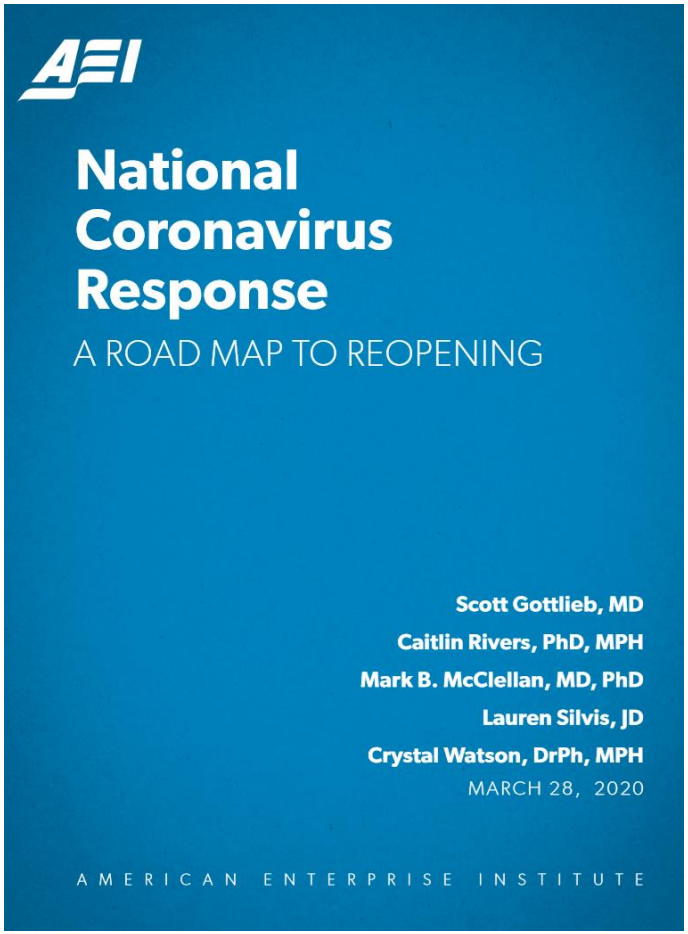
What to do?

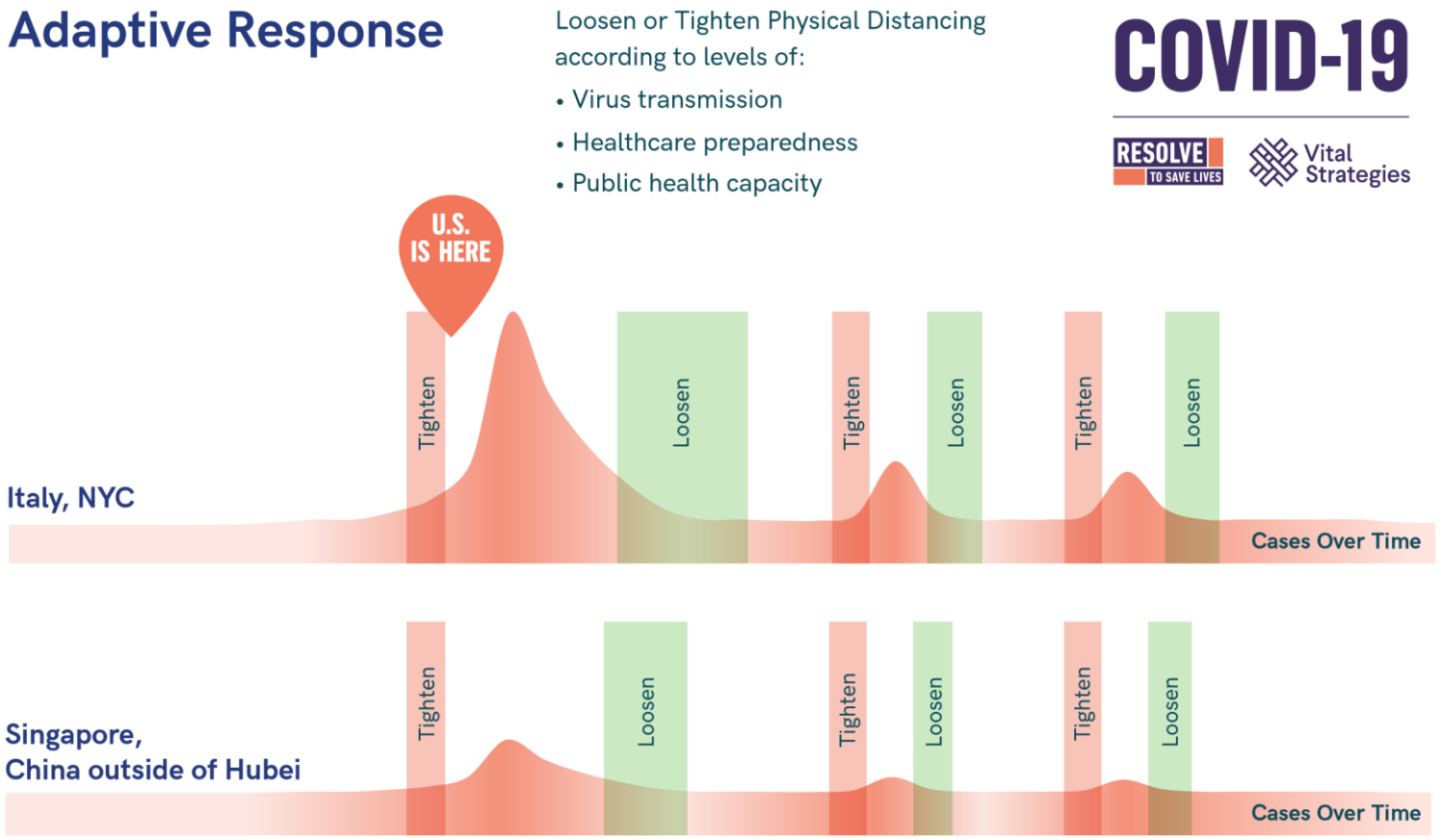
Trigger for Moving to Phase II

A state can safely proceed to Phase II when it has achieved all the following:

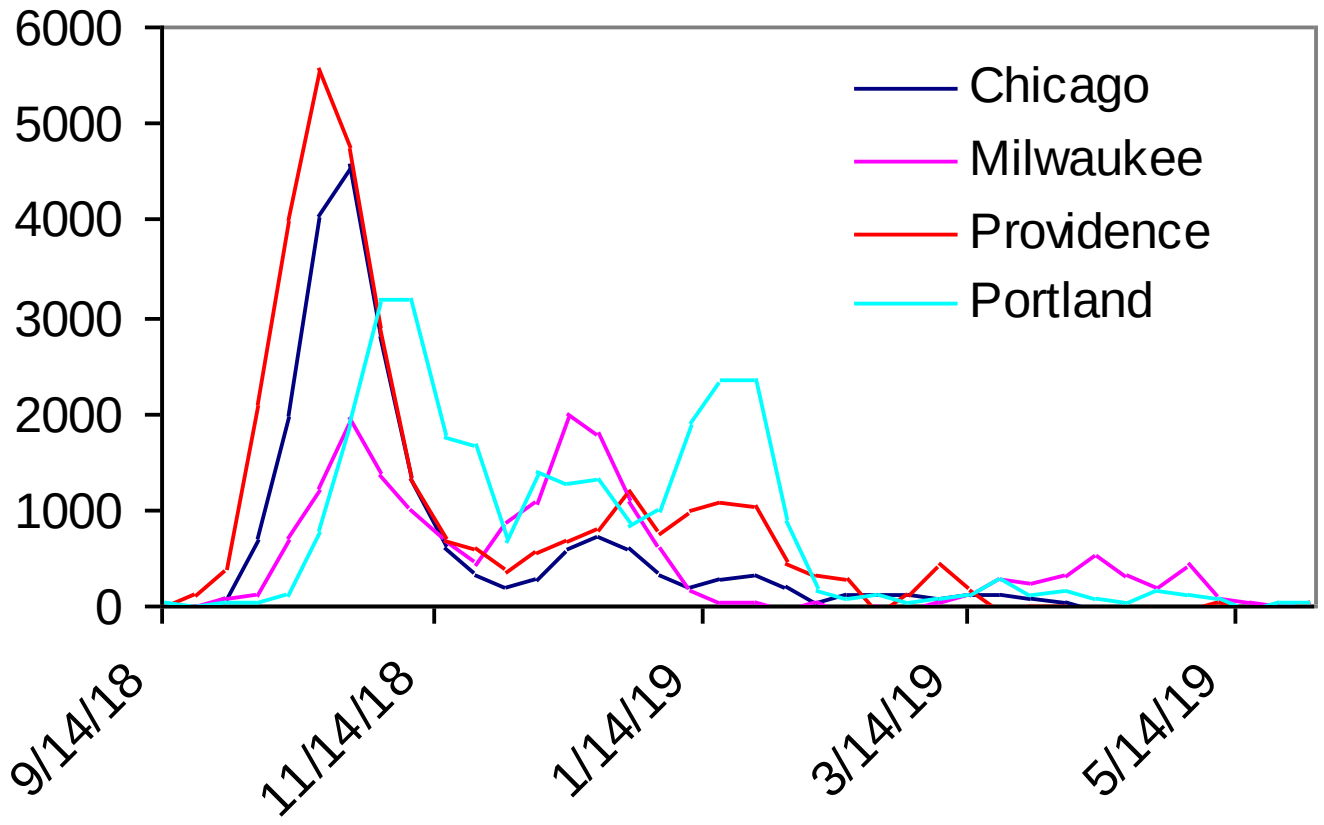
- A sustained reduction in cases for at least 14 days,
- Hospitals in the state are safely able to treat all patients requiring hospitalization without resorting to crisis standards of care,[22]
- The state is able to test all people with COVID-19 symptoms, *and*
- The state is able to conduct active monitoring of confirmed cases and their contacts.[23]



What to do?



1918 Influenza Pandemic had Multiple Waves as Interventions were Lifted



Common Challenges in Low- and Middle-Income Countries

- **Weak surveillance and response systems.** Countries may have difficulty in early detection and response to new cases, or setting up Incident Management Systems
- **Significant at-risk population.** Many people working in informal sector, depend on daily earnings. Remote populations with poor access to services are vulnerable
- **Multi-generational housing in crowded conditions.** Increase transmission and severity of infection among those most at risk
- **Limited health care capacity.** Healthcare worker shortages are common, and insufficient protective equipment puts them at risk. Wuhan required 2.6 ICU beds per 10,000 adults. Some developing countries have 1 ICU bed per 1,000,000 adults.
- **Other health conditions**. Consequence of overwhelmed health system is loss of services for pre-existing diseases and other preventable conditions, difficulty in managing pregnancy and childbirth
- **Low trust in public institutions.** Willingness to comply with government orders or use public services

Recommendations

1. **Shore up Incident Management Systems.** Ensure the technical public health and emergency management personnel are leading operations at national and local levels, with political support. Link IMS plans with other sectors (finance and social protection).

2. **Engage Community for problem-solving and credible messaging.** To identify and implement locally relevant social distancing and behavior change strategies (handwashing & face masks).

3. **Social distancing.** Many countries have been quick to impose travel bans, enforced quarantine, and curfews. Identify locally acceptable ways to reduce contact.

4. **Testing.** For surveillance at beginning and long tail of epidemic. For screening for clinical case management and symptomatic contacts. Otherwise you are flying blind

5. **Protect the healthcare workforce.** Focus on protective equipment (masks, gloves) and training.

6. **Support income in the informal sector and vulnerable populations.** If the the poor and marginalized populations continue to get ill, the epidemic is prolonged for everyone.

7. **Learn how control strategies are working.** Need to adjust course as epidemic peaks and during the tail end as strategies need to change.