

Examining the “Unanticipated Consequences” of Pandemic Flu

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Chain of effects

- Primary effects of a pandemic flu outbreak
 - Specific mortality & morbidity attributable to influenza virus
 - Initiation of public health pan flu protocols
 - Medical/pharmaceutical: vaccination, antiviral medication
 - Non-pharmaceutical interventions: respiratory and hand hygiene, social distancing, increased surveillance, quarantine & isolation, closure of schools and points of mass assembly, workforce shifts
- Secondary effects (the “unanticipated consequences”)
 - Health system congestion, disruption of preventive / primary / and chronic care
 - Quality of life shifts as a consequence of NPI’s + direct effects
 - Potential social disorder

Methods of examining potential 2nd order effects

- Literature reviews
- Policy reviews
- Focus groups
- Operational research / computer modeling (ongoing)
- Key Informant / opinion leader roundtables (ongoing)

Mortality data from the 1918 Influenza Pandemic illustrates some of the anticipated *and* the unanticipated consequences of a disaster

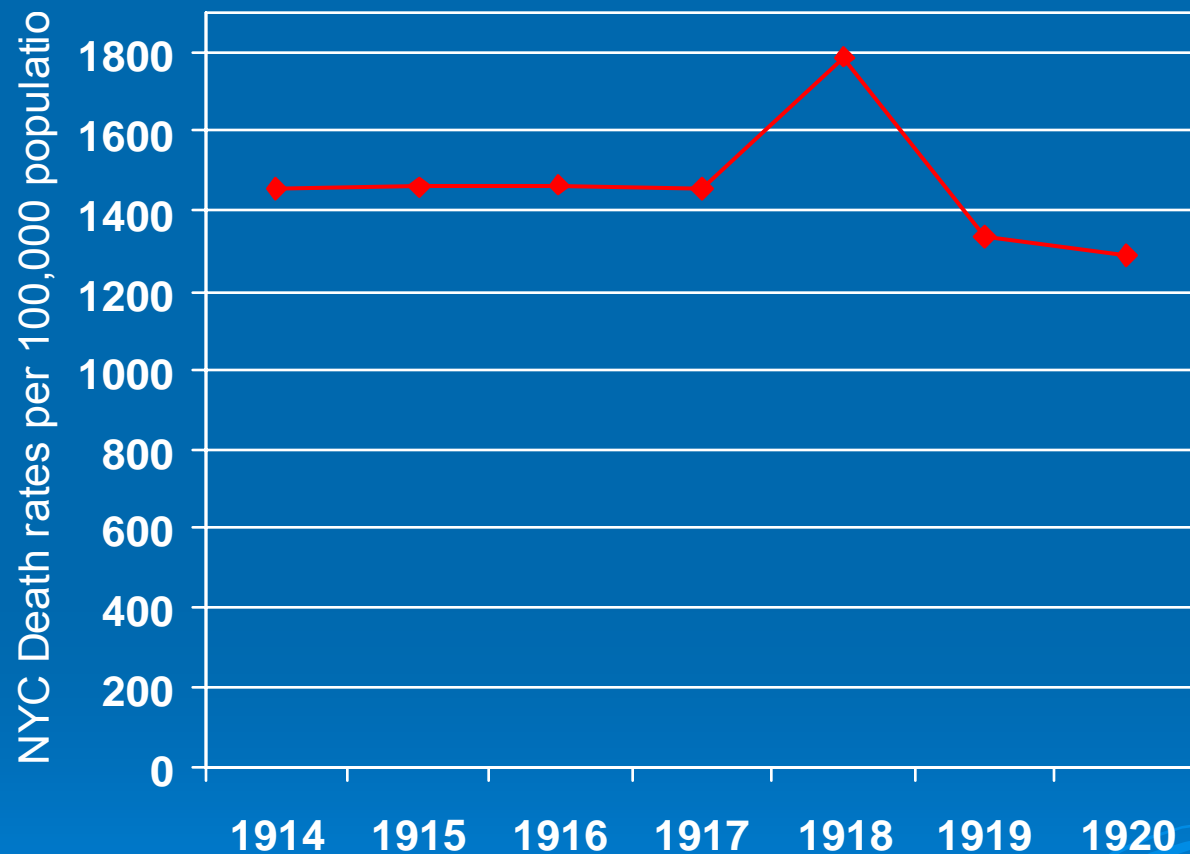
The 1918 Flu Epidemic first struck sailors, then soldiers, and finally civilians, with three waves of infection and death



Long-tailed period of infectivity and mortality... and need for mass casualty care

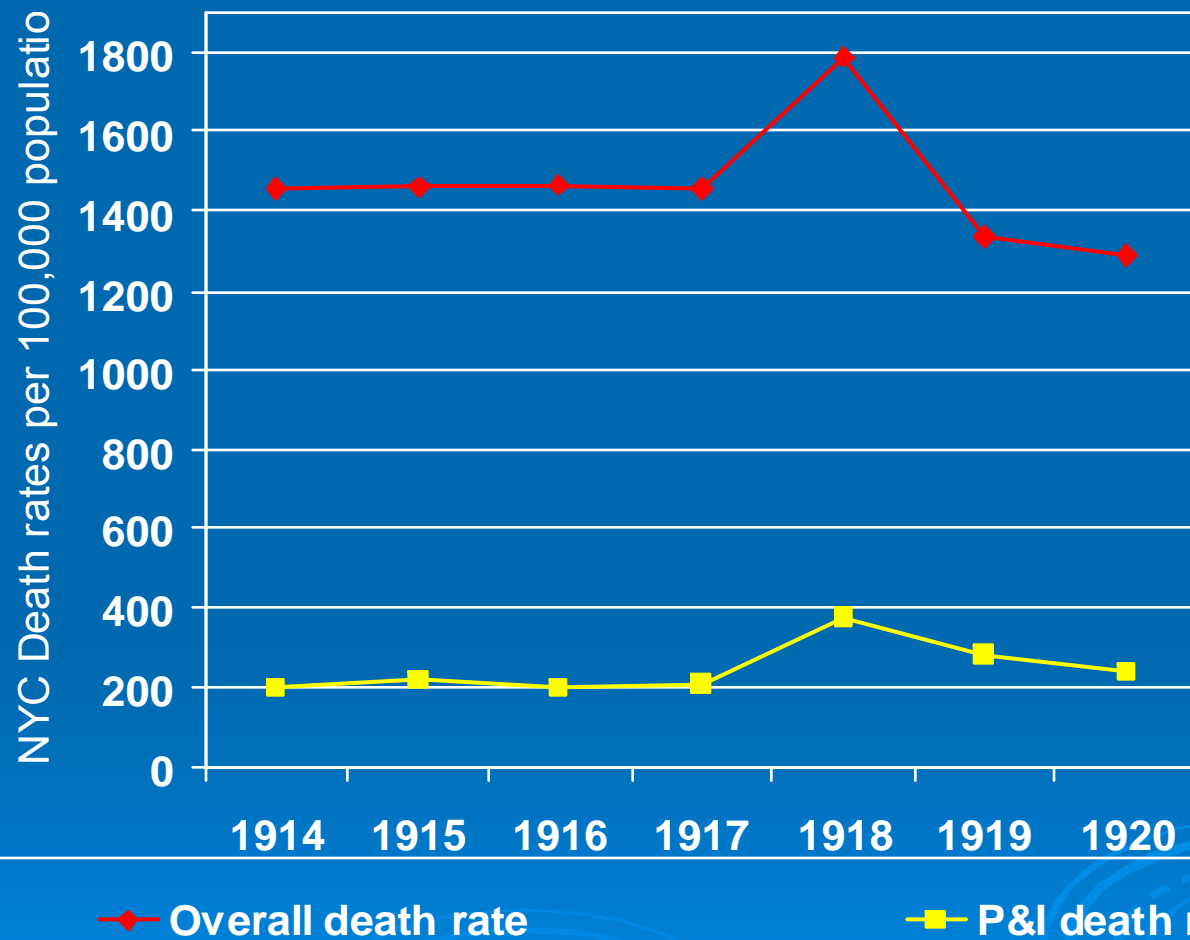
An emergency hospital at Camp Funston, Kansas (1918)

NYC Death Rates, Before & After the 1918 Flu Pandemic

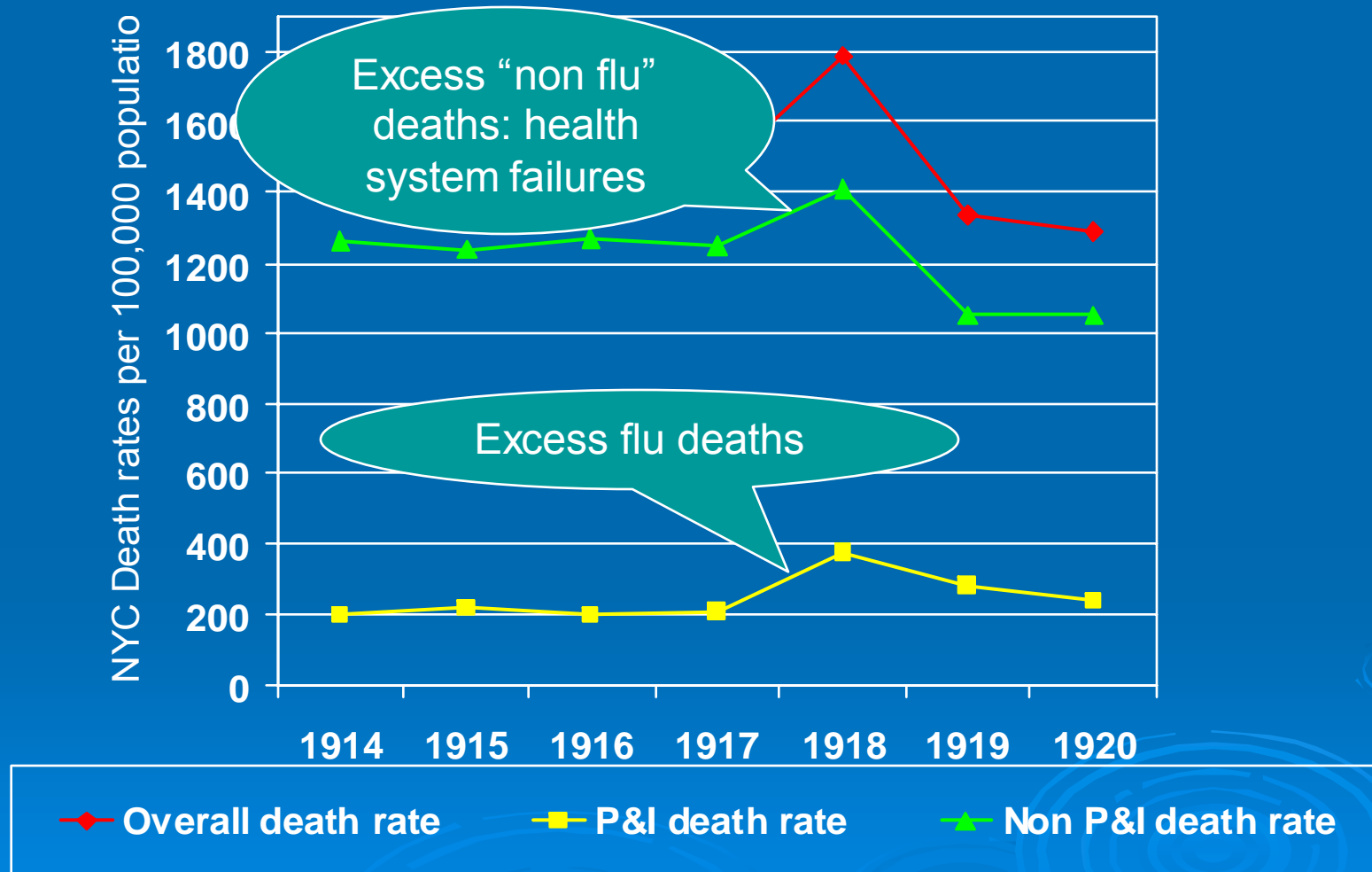


—◆— Overall death rate

NYC Death Rates, Before & After the 1918 Flu Pandemic



NYC Death Rates, Before & After the 1918 Flu Pandemic



Literature review

- Critical infrastructure loss / disruption
 - Workforce degradation
 - Access barriers
 - Domino effects (e.g., electric leads to water pump failure)
- Social behavior during pandemic / catastrophe
 - Generally adaptive and problem-focused
 - Pro-social rather than anti-social behavior is normative
- Health and social consequences of crowding and health system congestion
 - Unattended chronic care consequences
 - Potential for stigmatization and mental health sequelae
- School closures
 - Nutritional consequences (disruption of free lunch program)
 - Educational consequences (grade promotion, maintaining standards)
 - Unsupervised children (increase in risky and criminal behaviors)

Transportation Policy Review

- Documents retrieved and compared from 7 major US cities (Atlanta, Chicago, Miami, Portland OR, Seattle, SF, DC) and 6 international cities (London, Madrid, Mumbai, HK, Tokyo, Toronto)
- Criteria for comparison included:
 - Closing/curtailment policies
 - Sanitizing or disinfecting transit environment
 - Promoting social distancing on rapid transit
 - Restricting or surveillance of passenger vehicle traffic
 - Stockpiling and/or securing transit authority supply chain
 - Public communication prior to and during crisis

Transportation Policy Findings (US only)

- Most cities deem closure unlikely, too great an economic impact; partial closures often considered
- Social distancing only mentioned marginally
- Sanitizing & disinfecting only mentioned by two cities
- In absence of pandemic flu-specific plans, general hazard mitigation plans were reviewed – specific plans noted for evacuation, shifting populations to shelters
- Several plans noted supply chain practices, including stockpiling fuel supplies
- Default planning relegated to state and federal agencies

Transportation Policy “Best Practices” - Seattle

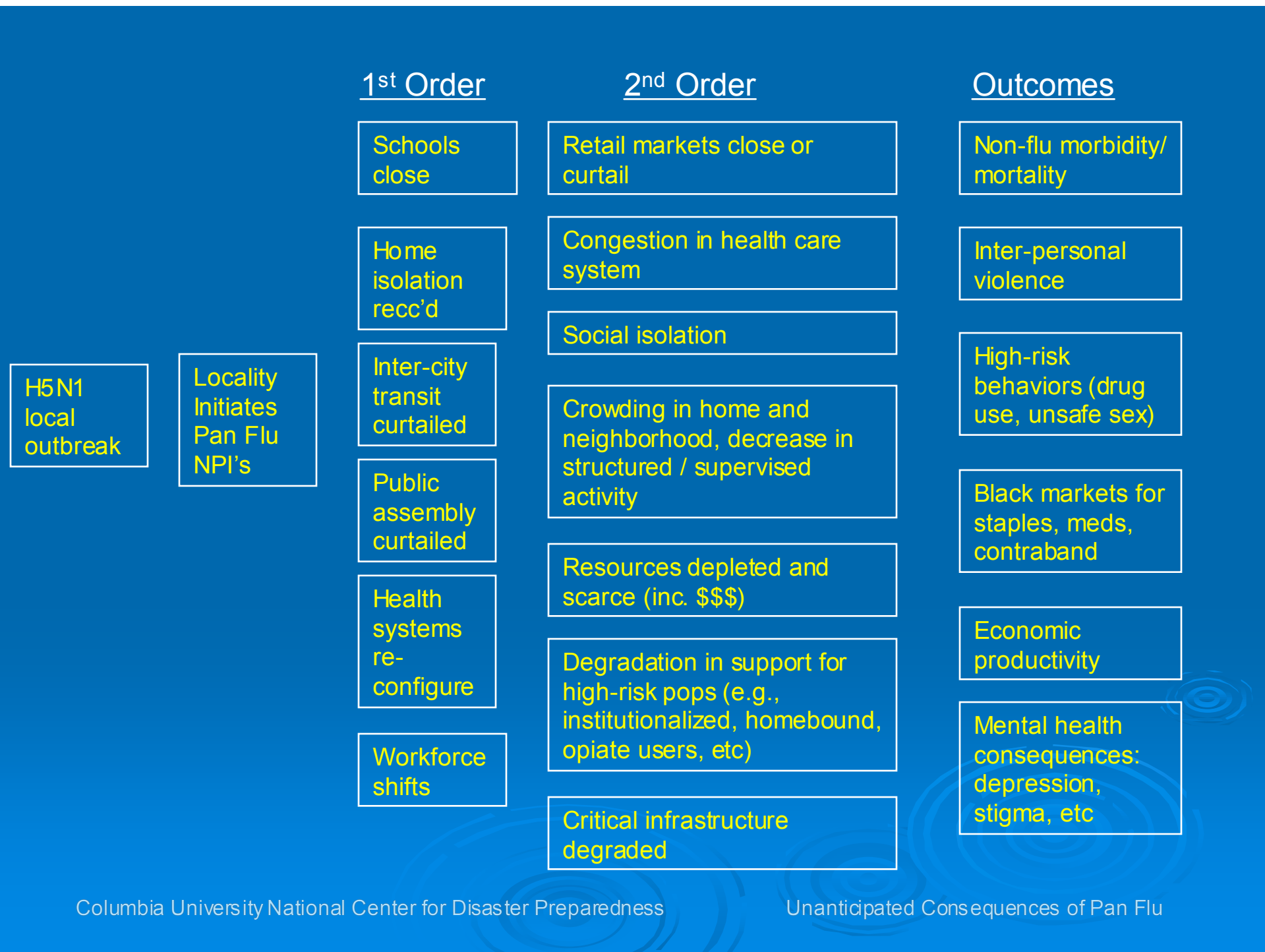
- Plan priorities transit as “essential,” and “must operate under pandemic conditions”
- Assumes workforce reduction of 60% of drivers and 40% other employees
- Priorities service for special needs populations
- Employees directed to sanitize immediate work areas
- Reserves a 4-6 fuel stockpile
- Social distancing measures incorporated by extending service to high traffic routes

Community-based focus groups

- Conducted in 6 ethnically diverse NYC neighborhoods
 - 4 in English, 1 in Mandarin Chinese, 1 in Spanish
 - Homogeneous groups included Chinese, Dominican, African-American, Jamaican/Caribbean, Greek, and Indian/Bengali
- Research focused on perceptions of neighborhood quality of life and adaptation during a pandemic, and potential response to NPI's
 - Additional focus on trusted messengers and messages
 - Cultural beliefs and “worldviews”

Focus Group Findings

- Communities vary in trust and dependency on government, and in strength of social networks
 - Chinese community expects government to provide staples
 - Black community concerned about civic unrest
 - Jamaican and Indian communities reported strong networks, with the latter mentioning connections to medical professionals
 - All seemed reasonably optimistic about negligible impact of long-term school closures or workforce interruptions
- Trusted media varied considerably by group, although most agreed on absence of a common “face” or “voice” for local public health



Systems affected by pan flu

Intervention	Economy	Education	Critical infrastructure	Normal health care	Safety in family & community
<i>School closure</i>	√	√√√		√	√√
<i>Home isolation</i>	√√		√		√√
<i>Health system contraction (triage)</i>				√√√	
<i>Mass transit closure / curtailment</i>	√√	√√	√	√	√