Covid-19 Scenario Dimensions
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1. The two most important scenario dimensions are global spread & severity – scenarios should reflect both dimensions (for the reasons illustrated below & based on our historical experience).

2. Global spread refers to large/national outbreaks, not imported cases or small clusters:
   a. None, or very limited, outside of China
   b. China + several/many high risk countries (which are either overwhelmed by imported cases, have weaker health systems, or both)
   c. Pandemic (nation-wide epidemics in most or all countries, though onset of initial epidemics in many countries may be delayed by several months, as we saw in 2009)

3. Severity is very complex (social, economic, health system, etc.), but can be simplified here as attributable mortality (nCoV-attributable deaths per 100,000 total population), which depends on the attack rate (AR) X case fatality ratio (CFR, requiring an appropriate denominator, or maybe fancy modelling?). The following are illustrative examples only (not meant to imply positive correlation between AR & CFR – they are actually, probably, somewhat negatively correlated):
   a. Low: 10% AR X 0.01% CFR = 1 death per 100,000 total population (1 / 100,000)
   b. Medium: 30% AR X 0.1% CFR = 3 deaths per 10,000 total population (30 / 100,000)
   c. High: 50% AR X 2% CFR = 1 death per 100 total population (1,000 / 100,000 = 1%)

4. The above lends itself to a 3 X 3 table, with 9 scenario cells:

Severity (deaths / total population)	Global Spread (epidemics in countries, not just imported cases)		
	Little outside China	China + high risk countries	Pandemic
High	1	2	3
Medium	4	5	6
Low	7	8	9

(Cell numbers, above, have no meaning. Scenario content may be drafted for several of these cells.)

5. Our first decent estimates related to severity may become available after several weeks of data start becoming available on the first 100, then 200, then 500, etc., cases imported into other countries.

6. If a substantial percentage of cases need care in hospital, then this may be a concern if the AR is substantial, because hospital surge capacity is pretty limited in many, most, or all countries.

7. Time is a third important scenario dimension: Median incubation may be ~ 5 days (?), and the serial interval ~ 7.5 days (?, compared to ~ 2-3 days for flu). If this is more or less correct, then we expect Covid-19 to spread, and outbreaks to grow, somewhat more slowly than with flu (as Ro is ~ 2?, as with flu). As in 2009, large outbreaks in many countries may be delayed until several months after detection of the initial outbreak (Dec. 31, 2019). Flu pandemic planning assumptions have included a duration for local outbreaks of up to 16 weeks, but for Covid-19, this duration remains uncertain, as does the seasonality of transmission.