COVID-19: How New Information Should Drive Policy

Senate Committee on Homeland Security and Governmental Affairs

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Chairman Johnson, Ranking Member Peters, and members of the Committee- I thank you for this opportunity, and your kind attention.

I am an Internist with a 30-year history of patient care (and several volunteer shifts in a hard-hit emergency department in the Bronx during the COVID19 crisis). I am a board-certified specialist in Preventive Medicine/Public Health, completing that training at Yale University, where I have held faculty positions in Medicine and Public Health. I founded Yale's Yale-Griffin Prevention Research Center in 1998, and directed that facility- focused on chronic disease prevention- for over 20 years. I have co-authored five editions of a leading textbook on epidemiology, public health, preventive medicine, and biostatistics- and directed courses on all of those topics at the Yale University School of Medicine for well over a decade. I am a past president of the American College of Lifestyle Medicine; President of the non-profit True Health Initiative; and founder/CEO of my own start-up company, Diet ID, Inc. I have a native penchant for the big picture that all too often seems to hide in plain sight.

- ***Synopsis:***

We should adopt "**total harm minimization**," aimed at mitigating the direct harms of COVID19, and the indirect harms of societal upheaval and economic collapse, as our national policy objective. This is best pursued by means of **risk-based (i.e. vertical) interdiction** policies that shelter/protect those most vulnerable to severe infection and grave outcomes, while **phasing back** to relative normalcy those in lower risk groups. Sequencing back to normalcy can also be informed by the relative importance of different business sectors and activities. The overlap of "high societal importance" and "low risk population" is the ideal, initial wave back to relative normalcy.

Risk-stratification should be **informed by data**, notably **representative random sampling** at the population level and the construction of a **data pyramid**. Policy should remain nimble, adaptable, and responsive to empirical data that accrue over time. Phased returned to degrees of normalcy should culminate in **herd immunity** and the "**all clear**," abetted by the advent of a **vaccine** when available.

Since many of the factors that elevate risk for severe COVID19 infection are modifiable (i.e., obesity, heart disease, type 2 diabetes, etc.), and are major, chronic burdens on the nation's health, economic vitality, and productivity- there has never been a better time for a **nationally mediated "get healthy" campaign**. There is both immediate and lasting potential benefit in this; risk of severe COVID19 infection can be attenuated in a matter of weeks, days, and to some degree, even hours. Because COVID19 translates chronic risks to which we have become complacent into acute risks evoking both rapt attention and anxiety, this situation is classically a "**teachable moment**" in the parlance of Preventive Medicine. A crisis, in other words, is a dangerous opportunity.

- ***Details of platform:***

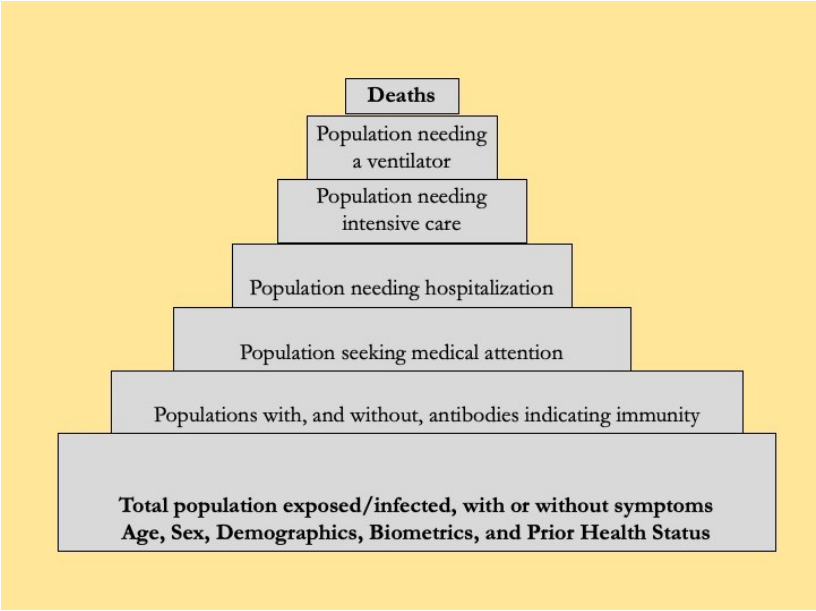
1) **The national policy objective should be *total harm minimization*** (1-3) **and establishment of a safe "all clear" for all population groups**
    a. Total harms of the pandemic encompass the direct toll of SARS-CoV-2 infection; immediate, indirect health effects related to neglect of other medical conditions; and longer-term indirect effects related to interdiction efforts, including but not limited to: unemployment; financial hardship; poverty; food insecurity; depression, anxiety, and other mental health disorders; addiction; domestic violence; suicide; homelessness; etc. (aka, social determinants of health; 4-8)
    b. The "all clear" is a state of sufficient safety that people may resume all desired activities without any specific prohibitions imposed by COVID19.
        i. A population-wide "all clear" is predicated on herd immunity
        ii. A highly effective, mass produced, universally administered vaccine is one path to herd immunity
        iii. Circulation of the virus among those most prone to mild infection and recovery, with subsequent, sequential exposure among those at incrementally higher risk of more severe infection is the alternative path to herd immunity
        iv. Evidence to date suggests that immunity does develop following infection with SARS-CoV-2 (9); and if it did not, an effective vaccine would certainly prove elusive (10)

2) **Primary means to the objective: vertical interdiction** (11) **and sequential herd immunity**
    a. Vertical interdiction refers to protecting those most vulnerable to severe infection with a concentrated allocation of all relevant resources, while phasing back to relative "normalcy" those least vulnerable
        i. In contrast, a one-size-fits-all approach to interdiction is "horizontal" and comes at a much higher cost in societal disruption and economic ruin
        ii. Vertical interdiction must be data-driven (see below)
    b. Flattening the curve: purpose and limitations
        i. Purpose
            1. Avoid medical system overwhelm
            2. Buy time for advancements
        ii. Limitations (12)
            1. Postpones, does not prevent, severe cases and deaths
            2. Requires a "subsequent" phase
    c. Herd immunity
        i. This is how pandemics end, whether mediated by infection and recovery, or immunization
        ii. Herd immunity = collective protection

iii. Herd immunity can be achieved while protecting those who cannot encounter the native infection by means of sequencing exposure for maximal safety based on risk stratification (13)
iv. Use immunity in others to defend the most vulnerable by creating a "dead end" for viral transmission

3) Required inputs for informed policy: constructing a data pyramid (14)

a. Structure of data pyramid, **FIGURE 1**



b. Data sourcing; site specificity
   i. The distribution of risk factors and outcomes of COVID19 infection will vary by population, so policy should be informed by population-specific (i.e., U.S, and/or state-level) data
   ii. Relevant data do not require whole-population testing, but can be acquired by means of representative random sampling
c. General risk assessment (15)
   i. Representative data are needed for infection and immunity
   ii. Corresponding data are needed for known and suspected risk factors for severe infection to determine how outcomes vary by risk classification
   iii. To date, available evidence indicates young (<50) and generally healthy equates to low risk (i.e., a small fraction of a percent for fatality) whereas as older (>70) and/or with major chronic disease burden (e.g., heart disease, kidney failure, type 2 diabetes) equates to high risk (i.e., something greater than 5%)

4) Refined risk stratification

a. Quantified risk calculation
    i. Risk calculation tools are available and being refined
    ii. Use of such tools can translate risk stratification from the population level to the individual level
b. Site specific applications
    i. Risks may vary by location
    ii. On-line risk calculators can adjust for geographic inputs

5) Ancillary opportunity: health promotion campaign

a. Modifiable risk factors for COVID19
    i. Poor diet, lack of physical activity, smoking, obesity, and chronic diseases related to these- heart disease, diabetes, COPD, etc.- constitute the major health burden in the United States, causing hundreds of thousands of premature deaths annually (16-18)
    ii. These chronic risks have been made "acute" by COVID19
b. Confluence of acute and chronic health risks
    i. This confluence of acute and chronic risk creates a unique opportunity to address both
    ii. Acute concern for COVID19 engenders a "teachable moment" (19)
    iii. This is an ideal time for a national "get healthy" campaign (20)

6) Specific challenges: prevailing fear, opposition, unknowns

a. Message clarity
    i. Must overcome polarized opposition
    ii. Consistent case for total harm minimization
b. Commensurates (21) should be a communication priority (e.g., the average risk of death from driving a car for two years; based on total US cases to date, more likely to be injured in a car crash this year than to get COVID)
    i. Compare unavoidable risks to familiar risks
    ii. Population specificity as warranted (e.g., kids in schools)

7) The case for humility and policy implications

a. Prior pandemics, and the vagaries of this one, call for humility about the important gaps in our knowledge (22)
b. There are known knowns
    i. Detected cases
    ii. Hospitalizations
    iii. Deaths
    iv. Risk factors (23)
    v. Unemployment figures
c. There are known unknowns
    i. Actual total cases (24)
    ii. Immunity prevalence, duration
d. There are unknown unknowns
    i. Pandemic "waves"
    ii. Viral mutations

e. We can, and should devise national policy despite uncertainties based on the best available data; however, this also calls for a nimble approach and willingness to adjust policy in response to empirical data that result from any given policy initiative. COVID19 will be "educating" us for some to come, and we should remain willing to learn, and to apply each new lesson to maximal advantage.

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