CEPI and COVID-19 VACCINES

June 9, 2020

Nicole Lurie, MD, MSPH
Strategic Advisor to the CEO and Incident Manager, COVID response team
CEPI
A world in which epidemics are no longer a threat to humanity

CEPI accelerates development of vaccines against emerging infectious diseases and enables equitable access to these vaccines for affected populations during outbreaks.
CEPI Strategic Objectives

**Preparedness**
Advance access to safe and effective vaccines against emerging infectious diseases

**Response**
Accelerate the research, development and use of vaccines during outbreaks

**Sustainability**
Create durable and equitable solutions for outbreak response capacity
3 Column slide

Small images or graphics can be used to highlight key items. These should always be circular
CEPI has multiple investments against its priority pathogens

- **MERS**: 5 vaccine candidates
- **Lassa**: 6 vaccine candidates
- **Nipah**: 4 vaccine candidates
- **Chikungunya**: 2 vaccine candidates
- **Rift Valley fever**: 2 vaccine candidates
- **Disease X**: 3 platform technologies
COVID-19 portfolio goals

**Speed**
Developing Covid-19 vaccines at pandemic speed

**Scale**
Scaling up and scaling out vaccine manufacturing capacity

**Access**
Working with global partners to ensure fair allocation of COVID-19 vaccines
Only a fundamental paradigm shift provides potential of rapid vaccine development with appropriate safety standards

**Major shifts**

**Speed:** Accelerate and advance development stages in parallel with continuous risk-benefit monitoring; quickly raise and deploy funds

**Scale:** Adaptive versus rigid development process and earlier launch of scale-up

**Access:** Geographic spread of manufacturing and development sites and pursuit of emergency authorization before licensure

**Traditional paradigm**

- **Target ID, development partner selection, and pre-clinical**
  - 6 - 24 months
- **Phase I**
  - 12 months
- **Phase IIa**
  - 12-18 months
- **Phase IIb**
  - 18-36 months
- **Licensure**
  - 12-36 months

**Outbreak paradigm**

- **Target ID, development partner selection, and pre-clinical**
  - 4 - 8 months
- **Clinical development**
  - Early stage
    - 3 - 4 months
  - Late stage
    - 6 - 8 months
- **Go/no-go decision to invest in candidates**
- **First in human**
- **Scale from n=10s to n=100s**
- **Emergency authorization**
- **Clinical development**
  - Early stage
    - 3 - 4 months
  - Late stage
    - 6 - 8 months

CEPI currently supports 9 vaccine candidates, with more to come

<table>
<thead>
<tr>
<th>Location</th>
<th>Inovio</th>
<th>University of Queensland / CSL</th>
<th>CureVac</th>
<th>Moderna</th>
<th>Clover BioPharma</th>
<th>Merck / Themis</th>
<th>Novavax</th>
<th>University of Hong Kong</th>
<th>AZ / Univ. Oxford</th>
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<tbody>
<tr>
<td>USA</td>
<td>Australia</td>
<td>Germany</td>
<td>USA</td>
<td>China</td>
<td>India</td>
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<td>RNA</td>
<td>mRNA</td>
<td>Protein</td>
<td>Viral Vector</td>
<td>Protein</td>
<td>Viral Vector</td>
<td>Viral Vector</td>
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<tr>
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<td>Full-length S protein / MF59 or AS03 or CPG1018</td>
<td>Full-length S protein</td>
<td>Full-length S protein</td>
<td>Full-length S protein / AS03 or CPG1018</td>
<td>Full-length S protein</td>
<td>Full-length S protein / saponin-based Matrix-M</td>
<td>Receptor Binding Domain / AS03</td>
<td>Full-length S protein</td>
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<td>Current phase</td>
<td>Phase 1</td>
<td>Preclinical</td>
<td>Preclinical</td>
<td>Phase I1a</td>
<td>Preclinical</td>
<td>Preclinical</td>
<td>Phase I</td>
<td>Preclinical</td>
<td>Phase I/II</td>
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<tr>
<td>Locations of large scale mfg (DS)</td>
<td>(1) Richter Helm, Germany; (2) Eurogentec, Belgium, (3) Inovio San Diego.</td>
<td>CSL/Seqirus</td>
<td>CureVac (Germany)</td>
<td>(1) Lonza (USA); [potentially (2) Lonza (CH); (3) Singapore]</td>
<td>Clover (China)</td>
<td>SII, India</td>
<td>(1) Emergent (USA); (2) SK Bio (KOR); (3) Praha (CZ)</td>
<td>CDMOs (China)</td>
<td>AstraZeneca (UK)</td>
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</tbody>
</table>
**Paradigm shift in Vx Development (SPEED-ACCESS-SCALE)**

In Disease X, fundamental paradigm shifts in vaccine development related to speed, scale, and access are required to ensure development advances as fast as possible while still meeting robust clinical efficacy and safety requirements:

1) **Speed is paramount**: rapidly accelerate target identification and development of vaccine candidates by using existing and previously validated (where possible) platforms for Disease X vaccines.

2) **Parallel versus sequential**: launch parallel processes wherever possible to minimize or eliminate whitespace between stages of development (e.g., conduct first in-human clinical trials while in parallel continuing animal studies, ramp-up clinical scale manufacturing while in parallel continuing to advance early stage trials).

3) **Adaptive versus rigid development processes**: apply integrated and adaptive trial design (e.g., ring vaccination) to replace classical development stages (i.e., Phase I, IIa, IIb/III) with consolidated early-stage development (10s of subjects) and late-stage development (100s of subjects) to accelerate trial timelines.

4) **Continuous monitoring and rigorous benefit-risk decision making based on specific scenarios**: track real-time epidemic status (e.g., severity of morbidity and mortality rates) to inform benefit-risk decisions at any point in time with pre-established clinical efficacy, safety, and other non-clinical “no go” criteria, as well as accumulation of effectiveness data from every exposed subject.

5) **Prioritize rapid and equitable access**: pursue emergency authorizations as soon as the benefit-risk profile is sufficiently established for broad scale use (rather than wait for regulation / market authorization).
Challenges ahead

• Resource mobilization, financing and advanced market commitment

• Liability / indemnification

• Balancing fair allocation/equitable access with sovereign country needs

• Safety monitoring and vaccine literacy/confidence

• Delivery / distribution/ last mile
Our Call

We ask the global community and political leaders to support this landmark collaboration, and for donors to provide the necessary resources to accelerate achievement of the objectives of this global collaboration, capitalizing on the opportunity provided by the forthcoming pledging event on 4 May 2020.
COVAX facility as a global approach

THE COVAX FACILITY

The COVID-19 Global Vaccines Access Facility (COVAX Facility) is being developed to address these unprecedented challenges. It will invite global participation to pool demand and resources to support procurement of COVID-19 vaccines. The Facility will be supported by financing instruments to facilitate pooled procurement for all participants. The funding for vaccines for upper-middle-income countries (UMICs) and high-income countries (HICs) will be pooled from domestic health funds to secure doses for contributing countries. The COVAX Facility is being established to support procurement and delivery of vaccines for developing countries.

Just as an insurance policy manages uncertainty, so the uncertainty that is inherent in the current situation – about which vaccines will be effective and safe, and about the course of the pandemic – needs to be managed. The COVAX Facility, and the financing for LICs and LMICs provided by the Gavi COVAX AMC, which will form part of the Facility, will do this by:

- ensuring that funding of vaccines is available for lower-income countries
- pooling resources and sharing risk
- supporting the scale-up of supply
- allocating supply to contain the pandemic

The COVAX Facility is an umbrella mechanism. Currently being developed in the Vaccine Task Force of the ACT Accelerator, the COVAX Facility:

THE GAVI COVAX AMC

Building upon two decades of experience in accelerating the availability of billions of doses of vaccines, Gavi is launching an investment opportunity: the Gavi Advance Market Commitment for COVID-19 Vaccines (Gavi COVAX AMC) – the ODA-supported financing instrument of the COVAX Facility.

The Gavi COVAX AMC will use official development assistance (ODA) funds from OECD donors to incentivise manufacturers through guarantees to ensure sufficient global capacity is installed before vaccines are licensed. It will then procure vaccines and assist in delivery for LICs and LMICs, including International Development Association (IDA)-eligible small island economies.

Combined, these countries account for almost half of the world’s population. Without such an intervention, they may not be able to obtain and use vaccines as part of a global effort to slow and ultimately stop the pandemic.

The Gavi COVAX AMC will be the first building block of the COVAX Facility and will incentivise investments so that capacity is secured to guarantee access to substantial volumes of safe and efficacious vaccines. It will be supported by additional building blocks to enable self-financed advance commitments towards pooled procurement of doses by HICs and UMICs.

The Gavi COVAX AMC will:

The COVAX Facility and the Gavi COVAX AMC will support each other by:

CEPI
Front-runners, Hurdles, and Insider Perspectives: The Race to Develop and Implement a Safe and Effective COVID-19 Vaccine

HHS National Vaccine Advisory Committee (NVAC) Meeting
June 9, 2020

Amy Walker
Senior Manager, Infectious Diseases Policy, BIO
Objectives

• Review current COVID-19 vaccines pipeline and status of R&D
• Overview of challenges to COVID-19 vaccine development
US may never get back to 'normal' after coronavirus crisis, Dr. Anthony Fauci says

The White House health adviser said at a press conference that the coronavirus could continue to return and disrupt everyday life until there is a vaccine.
BIO’s Approach to COVID-19 Pipeline Analytics

1. Drug Name
2. Phase
3. Sponsoring Company

BIO Industry Analysis

1. Originating Company
2. Pipeline Category (Antiviral, etc.)
3. Drug Origin Type (Repurposed, etc.)
4. Modality
5. Strategy
6. Target Family

Bio.org/covidpipelinetracker

Note: BIO de-duplicates multiple programs and trials for same drug
Timing of Response

Week of first press release announcing program

>550 unique development programs launched in 20 weeks

Week 1 after SARS-COV2 sequence published by China, Jan 10th
3 COVID-19 Pipelines

- Vaccines: 142 (25%)
- Antivirals & Antibodies: 170 (31%)
- Treatments for COVID-19 Illness: 244 (44%)

Biomedtracker, Biocentury, BIO Industry Analysis (Data as of 6/4/2020)
16 Clinical-Stage COVID-19 Vaccines
Many Technologies Deployed for Many “Shots on Goal”

- Full Vaccine Pipeline

<table>
<thead>
<tr>
<th>Vaccine Type</th>
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- Clinical Stage Vaccines

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<tr>
<td>Viral-based vax</td>
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<tr>
<td>rViral-based vax</td>
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</tr>
<tr>
<td>Cell-based vax</td>
<td>5</td>
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</table>
Clinical Stage Pipeline & Preclinical “Watchlist”

Preclinical Phase 1 Phase 2 Phase 3

Viral Vector
- Johnson & Johnson
- MERCK
- THEMES
- CanSinoBio
- SHENZHEN GENO-IMMUNE MEDICAL INSTITUTE

Viral Inactivated
- MERCK
- astrazeneca
- SinoVac
- Symvivo

RNA
- SANOFI
- TranslateBio
- BIONTECH
- Pfizer
- Moderna

DNA
- Novio Beijing Advaccine Biotechnology

Cell Based
- ARCHIVEL
- Symvivo

Recombinant protein
- SANOFI
- GSK
- Novavax

Source: Biomedtracker, Biocentury, BIO Industry Analysis
1. PrEP Biopharm vaccine dsRNA, all others mRNA
Sinopharm with two vaccines in phase 1 trials (one beginning Apr 12 the other Apr 27)

Info as of May 25, not exhaustive
Manufacturing & Scale Up

Emergent BioSolutions, BARDA reach $628M deal to manufacture COVID-19 vaccine hopefuls
by Kyle Blankenship | Jun 1, 2020 4:00pm

GSK announces intention to produce 1 billion doses of pandemic vaccine adjuvant in 2021 to support multiple COVID-19 vaccine collaborations

J&J and Catalent ink deal for COVID-19 vaccine manufacturing
Apr 29, 2020

Moderna and Lonza Enter Large-Scale Manufacturing Deal for Potential COVID-19 Vaccine
Published: May 01, 2020 | By Mark Terry

AstraZeneca unveils massive $750M deal in effort to produce billions of COVID-19 shots
by Kyle Blankenship | Jun 4, 2020 11:08am

Headlines featured here are a sample of ongoing work, not exhaustive
Challenges to COVID-19 Vaccine Development

• Scientific
  • Understanding of disease
  • Understanding of populations most at-risk
  • Shifting epidemiology

• Manufacturing
  • Record time scale-up
  • Fill/finish bottlenecks
  • Ancillary products
  • Not disadvantaging existing routine vaccines

• Public confidence
BIO COVID-19 Pipeline Tracker

COVID-19 Therapeutic Development Tracker

- Vaccines: 131
- Antivirals: 155
- Clinical Compounds: 158
- Preclinical Compounds: 343
- Treatments: 215

Most Advanced COVID-19 Antiviral Candidates

Numerous Ways to Target COVID-19: Top Strategies

- Anti-inflammatory (CNS-direc)
- Protein-based
- COVID antibodies
- Antiviral
- Antibody
- Antagonist
- Antimicrobial
- Antiviral
- Antioxidant
- Antiviral (immunologic)
- Antiviral (steroidal)
- Antiviral (complement)
bio.org/covidpipelinetracker

Amy Walker
Senior Manager, Infectious Diseases Policy, BIO
awalker@bio.org
Development of a Coronavirus Vaccine for Global Access

Peter Hotez MD PhD
Professor of Pediatrics and Molecular Virology & Microbiology
Dean, National School of Tropical Medicine
Baylor College of Medicine

Leading the development and testing of low-cost and effective vaccines against emerging and neglected tropical diseases
Leishmaniasis

Maria Elena Bottazzi

Female Genital Schistosomiasis 40 million Girls and Women

Leishmaniasis
SARS CoV2-COVID19 Vaccine Approaches

Vaccine Platform Technologies in Development for COVID-19

Genetic immunization (DNA and RNA vaccines)
- NIAID/Moderna, CureVac/NIAID
- Inovio/Beijing AdVaccine

Recombinant protein
- Baylor and collaborators

Viral vector (ex: adenovirus)
- Johnson & Johnson, Jenner/NIAID

Nanoparticle (viral protein on particle)
- Novavax

Live attenuated
- Codagenix

Selected development programs
Coronavirus Vaccine Initiative

Product Development Partnership

Led by Texas Children’s Hospital Center for Vaccine Development, Baylor College of Medicine

Partnership launched in 2011 with New York Blood Center (Jiang, S. & Du, L.), University of Texas Medical Branch (Tseng, C-T) & WRAIR

Grant: R01AI098775
SARS-CoV RBD219-N1 Protein Candidate

Proven Platform: *Pichia pastoris* X-33 Vector: pPICZaA
Insert: SARS-CoV RBD, wild type with N1 deleted, no tags

MCB cGMP Lot # 1970 MFG: WRAIR Jan 12, 2016
PCB cGMP Lot # 1971 MFG: WRAIR Jan 14, 2016
DS cGMP Lot # 2015 MFG: WRAIR July 2016

Production Yield: 0.107 g/L DS; Purification Process Recovery: ~ 50%
Cost of Goods: Estimated <$10/dose

DS concentration: 1.48 mg/mL Buffer: 20 mM Tris, 150 mM NaCl, pH 7.5
Stability: at least 36 months, next testing time point at month 48 in July 2020. Stored at frozen (-70ºC to -80º)
Formulation: 100ug with Alhydrogel® in 1.0 mL
SARS-CoV RBD219-N1 vaccination induces 100% protection against lethal MA-15 SARS-CoV challenge and strong neutralizing antibodies.
Evidence of Safety for SARS-CoV RBD219-N1 vaccine

Immunohistochemistry for eosinophilic infiltration in mice immunized with Alhydrogel® alone, with SARS-CoV RBD219-N1/Alhydrogel and with SARS-CoV S/Alhydrogel ®. Scale bar = 200 µm.
Aligning to Achieve Global Access

Partnership between PATH Center for Vaccine Innovation and Access (CVIA) for a 2-stage approach
- An accelerated US-based time schedule for FIH
- Transition to a developing country vaccine manufacturer

A shovel-ready SARS CoV candidate as a heterologous vaccine against COVID-19
- cGMP Formulation, Fill-and-Finish
- Parallel GLP (Rabbit) Toxicology Testing
- All-in Strategy: securing a SARS CoV-2 regulatory strategy with a SARS CoV vaccine candidate
- Proposed Phase 1 randomized, placebo-controlled, observer-blind trial to assess the safety and immunogenicity in healthy adults 18 through 45 years of age.
SARS-CoV and COVID-19 spike proteins are structurally very similar

Figure 1. Comparison of the known structure SARS-CoV RBD (A), the deduced molecular model of 2019-nCoV, generated by performing molecular simulation (B), and the two structures superimposed.
Structural alignments of SARS-CoV (6acj) and COVID-19 (6svb). Only central H1 helix backbone atoms used for alignment (RMSD=0.7Å)
Binding of SARS-CoV RBD protein and SARS-CoV-2 RBD to the cell-associated and soluble ACE2 receptor

(Tai et al., 2020)
Anti-SARS-CoV-RBD-N219 serum cross-reacts with SARS-CoV-2 RBD and S proteins

Mice immunized w/ SARS-CoV RBD-N219/Alhydrogel vaccine

1st injection 2nd injection Serum collection
n 2n 1 1

Pooled sera collected from Balb/c mice 10 days after the 2nd subcutaneous immunization with 20 ug SARS-CoV RBD-N219 and 2 mg Alum (Chen et al., 2014).

Courtesy Dr. Lanying Du
Mouse sera against SARS-CoV RBD219-N1 vaccine cross-neutralize of SARS-CoV-2 pseudovirus infection

Neutralizing antibody (nAb) titer of yeast SARS-CoV RBD219-N1 protein-immunized mouse sera against SARS-CoV (A) and SARS-CoV-2 (B) pseudovirus infection (control: PBS);

Courtesy
Dr. Lanying Du
Providing additional value towards the COVID-19 vaccine development efforts

A high quality (cGMP) SARS-CoV RBD antigen comparator for:
- Cross-reaction/cross-protection evaluation
- In vitro immunoassays and competition assays Cross-neutralization assay
- In vivo immunogenicity, safety and efficacy Front run for coronavirus RBD-based candidate vaccines
- Shovel ready for pre-clinical and clinical studies
- Accelerate and leapfrog fast follow-on SARS-CoV-2RBD-based candidate vaccines (i.e. Sanofi repurposed SARS Vaccine)

An important benchmark for evolution of SARS-CoV-2
- Potentially useful in the event of a mis-matched SARS-CoV-2 vaccine as “drift” accumulates

**SARS CoV RBD RBD219-N1**
- cGMP Manufactured in 2016
- "Shovel ready" start of phase 1 clinical trial Q3 2020
- Investigational vaccine recommended for outbreak use in 2021

**SARS CoV2 RBD**
- cGMP manufacture targeted for Q3 2020
- Start of phase 1 clinical trial 2021
- Investigational vaccine recommended for outbreak use in 2022, possibly earlier
COVID19 Meets the Antivaccine Movement

ALL ADULT AMERICANS

Interest in Coronavirus Vaccine
How interested would you be in getting a coronavirus/COVID-19 vaccine, if at all?
How interested would you be in getting your children a coronavirus/COVID-19 vaccine, if at all? (asked of parents)

% Very/Somewhat interested

- 65% Interested in getting coronavirus vaccine for themself
- 54% Interested in getting coronavirus vaccine for their child
Figure 1. Percent of Students in Kindergarten through 12th Grade with a Conscientious Exemption on file for at least one vaccine

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<thead>
<tr>
<th>Year to Year</th>
<th>Numbers</th>
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<tr>
<td>2003 to 2004</td>
<td>2,314</td>
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<td>2004 to 2005</td>
<td>2,722</td>
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<tr>
<td>2005 to 2006</td>
<td>6,991</td>
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<td>2006 to 2007</td>
<td>9,604</td>
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<td>2007 to 2008</td>
<td>10,404</td>
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<td>2008 to 2009</td>
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<td>2009 to 2010</td>
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<td>2010 to 2011</td>
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<td>2011 to 2012</td>
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<td>2012 to 2013</td>
<td>32,616</td>
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<td>38,197</td>
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<td>56,738</td>
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<td>2018 to 2019</td>
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Source: DHEA, June 2014
THANK YOU

Coronavirus Product Development Partnership
Led by Texas Children’s Hospital Center for Vaccine Development, Baylor College of Medicine

Partnership with New York Blood Center (Jiang, S. & Du, L.), University of Texas Medical Branch (Tseng, C-T) & WRAIR
Herd Immunity and COVID-19 Vaccines:
Five Key Principles

David Dowdy, MD PhD
Dept of Epidemiology, Johns Hopkins Bloomberg School of Public Health
National Vaccine Advisory Committee
June 9, 2020
Herd (Community) Immunity

A situation in which a sufficient proportion of a population is immune to an infectious disease (through vaccination and/or prior illness) to make its spread from person to person unlikely.

Even individuals not vaccinated (such as newborns and those with chronic illnesses) are offered some protection because the disease has little opportunity to spread within the community.

Centers for Disease Control and Prevention, https://www.cdc.gov/vaccines/terms/
Principle 1.
As traditionally calculated, the “herd immunity threshold” for SARS-CoV-2 is probably 60-70%.

Standard equation:
\[ R_0 = \text{Basic reproductive number} \]
(probably \( \sim 2.5 \) for SARS-CoV-2)


Herd immunity threshold = \( 1 - 1/R_0 \)
\( (1 - 1/2.5 = 0.6) \)

Fully Susceptible Population: 2 index cases \( \rightarrow \) 5 secondary cases
If 60% of Population is Immune: 2 index cases \( \rightarrow \) 2 secondary cases
Principle 2.
If susceptibility in the population is non-uniform, the herd immunity threshold is lower.

If the most susceptible individuals are infected first, the remaining population is less at-risk.

Can reflect immunological or sociological differences

One group has suggested the herd immunity threshold for SARS-CoV-2 may therefore be \( \sim 30\% \).

https://www.medrxiv.org/content/medrxiv/early/2020/05/21/2020.04.27.20081893.full.pdf
Principle 3.
Even if the herd immunity threshold is met in a population, outbreaks can still occur.

Both natural infection and vaccine uptake will be heterogeneous.

Transmission can still be sustained in populations that are incompletely vaccinated.

Well-known example of measles outbreaks in the USA (91.5% of the US population vaccinated)

Principle 4.
Herd immunity depends on vaccine efficacy and duration of immunity.

In NYC, 20% tested positive for antibodies in April 2020.

To get to 60% immunity:
- 50% coverage of 100% efficacious, durable vaccine
  - 60% w/ waning natural immunity
- 80% coverage of 70% efficacious, durable vaccine
  - 85% w/ waning natural immunity

Assuming infection-fatality ratio of 0.4%:
- About 8% of the US population immune?
- Increasing by ~1.5% per month?

Principle 5.
Herd immunity is a continuum, not a threshold.

The goal of vaccination is not to reach a pre-defined threshold, but to save lives.

Even a vaccine that doesn’t achieve a threshold will save lives, and vaccines that far exceed the threshold will save the most.
Summary: Five Principles

- The “standard” herd immunity threshold is likely 60-70%.

- This threshold might be substantially lower (as low as 30%?) if susceptibility is non-uniform.

- Outbreaks can still occur if the population as a whole is vaccinated above this threshold.

- Achieving herd immunity depends on vaccine efficacy & duration of (natural & vaccine-induced) immunity.

- The goal of vaccination should be to optimize coverage * efficacy (and duration), not to meet a specific threshold.
The Fight Against COVID-19—Bedside & Beyond

June 9, 20 National Vaccine Advisory Committee
Melody Butler, BSN, RN, CIC
COVID19 – Nursing Perspective

- A Hot Spot Timeline
- Challenges at Bed Side
- Challenges Online
- Lessons and Observations
Suffolk County, NY: COVID-19 Case Timeline
Suffolk County reported the following information related to COVID-19 on June 7, 2020

Testing
216,000 COVID-19 tests have been administered, an addition of 4,582 tests*
18.7 percent of those tested were confirmed positive for COVID-19
128,707 total tested for antibodies

Tested Positive for COVID-19
40,329 total cases
51 new cases

Tested Positive for Antibodies
15,441 individuals not previously tested for COVID-19 have tested positive for antibodies

Hospitalization* as of June 7 at 4:30 p.m.
158 individuals were hospitalized, a decrease of 21
50 patients were in the Intensive Care Unit (ICU), no increase or decrease from 6/7
7 new admissions
26 discharged
5,104 discharged since March 22

Fatalities
8 new fatality*
1,931 total fatalities

Hospital Beds, as of June 7 at 4:30 p.m.
3015 total hospital beds; 1135 available*
576 ICU beds; 252 available*
Working in a Hotspot
COVID19 At The Bed Side
Supplies
Construction- Environment and rooms
Staffing
Getting better
Use of telehealth
Battling Online COVID 19 Misinformation

Judy Mikovits is a disgraced scientist who claimed a retrovirus caused chronic fatigue syndrome, results later soundly refuted. She went antivaccine for a while but has now been reborn as a COVID-19 grifter.
Online Misinformation Long term damage
Battling Online COVID-19 Misinformation

EMPTY HOSPITALS AROUND THE WORLD. VIRUS HOAX.

FALSE

7 children were given the vaccination in Senegal and they were all dead on the spot.
Facebook and the other companies have been much more aggressive about taking down speech by actual Americans that they deem to include dangerous theories about coronavirus. So, for example, you can’t — you’re not supposed to be able to run an ad that says, buy bleach, bleach will — by drinking bleach, you will kill coronavirus, right? And so they have taken those steps on things that are clearly factually inaccurate.
Battling Online COVID-19 Misinformation

- Get Ready for a Vaccine Information War

- Social media platforms already have misinformation about a COVID-19 vaccine, months or years before one even exists

Anti-vaccine demonstrators outside the Centers for Disease Control and Prevention in Atlanta in June. Audra Melton for The New York Times
Flashback to 1918 Spanish flu Pandemic

A clipping from the San Francisco Chronicle on October 29, 1918. The San Francisco Chronicle

A clipping from a Long Beach newspaper on January 21, 1919. Some referred to San Francisco as "Frisco." The Long Beach Telegram and The Long Beach Daily News

▲ People wait in line to get flu masks to avoid the spread of Spanish influenza on Montgomery Street in San Francisco in 1918. Photograph: Hamilton Hobbins/California State Library handout/EPA
"History doesn't repeat itself, but it often rhymes."
Attributed to Samuel Clemens (Mark Twain)
Lessons and Observations

- Embrace opportunities of incorporating 21st century technologies into patient care and education
- Ongoing need for medical surge and intensive care capacity.
- Public trust is a government’s most valuable asset.
- **Act quickly** and efficiently to educate and debunk misinformation.
Having a system we can trust is critical
Thank You!

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