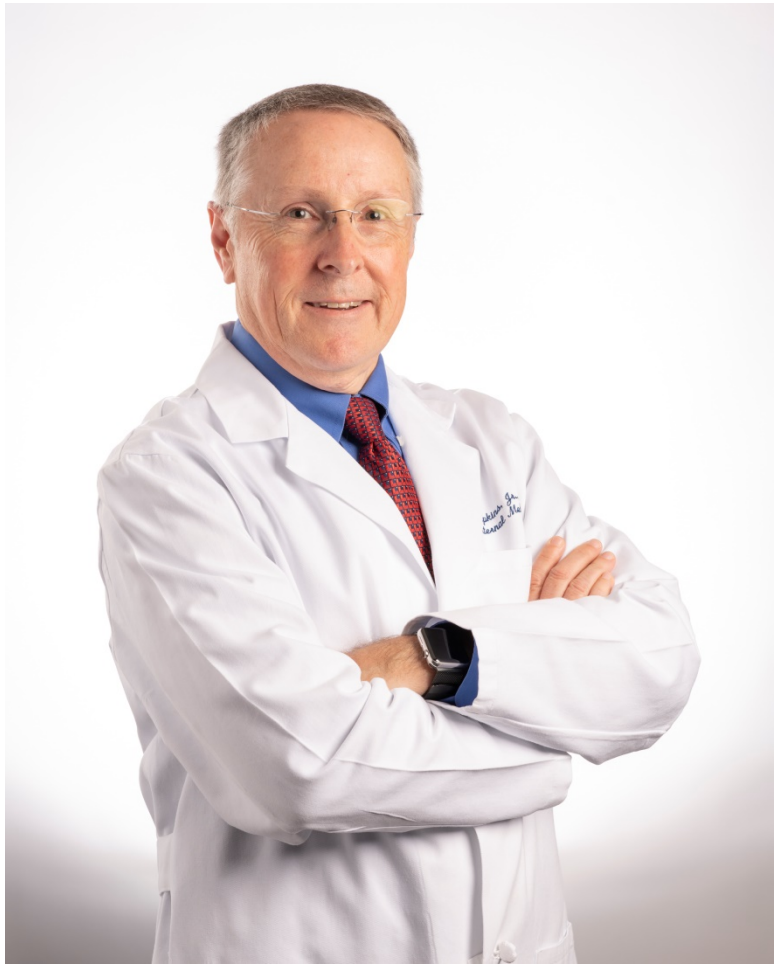
Public Meeting

# NATIONAL VACCINE ADVISORY COMMITTEE

October 16, 2020

NVAC



October 16, 2020

# CHAIR'S WELCOME

**Robert H. Hopkins, Jr., MD, MACP, FAAP**
Chair, National Vaccine Advisory Committee

NVAC

# Housekeeping

- In person, public meeting available via webcast only:
  - **Webcast:** www.hhs.gov/live
- The meeting is recorded and streamed, so statements made may be included in the meeting minutes.
- Before speaking, please ensure you are not muted and identify yourself. Please speak clearly and mute yourself when not speaking.

# Public Comment

- Verbal comments scheduled:
  - **Oct. 16:** 4:30 p.m., Eastern Time
  - **Please email nvac@hhs.gov by 2:30pm** if you would like to provide verbal public comment.
  - Please limit all verbal comments to 3 minutes in length
- Submit written comments to nvac@hhs.gov
  - Limit written comments to 3 pages in length
  - NVPO will include all properly submitted written comments in the meeting minutes

# Meeting Highlights – Oct. 16

- Approach to Proceed with Covid-19 Vaccines for Children
- Lessons Learned: Covid-19 Vaccine Development
- Building Confidence in the Immunization System Before, During and after Covid-19 Vaccine Implementation
- Public Comment
- Charge Discussion and Vote

# Upcoming Meetings

- February 4-5, 2021
- June 16-17, 2021
- September 15-16, 2021


**Learn more:** www.hhs.gov/vaccines/nvac

Public Meeting

# NATIONAL VACCINE ADVISORY COMMITTEE

Oct. 16, 2020

NVAC

# Time to Begin COVID-19 Vaccine Clinical Trials in Children

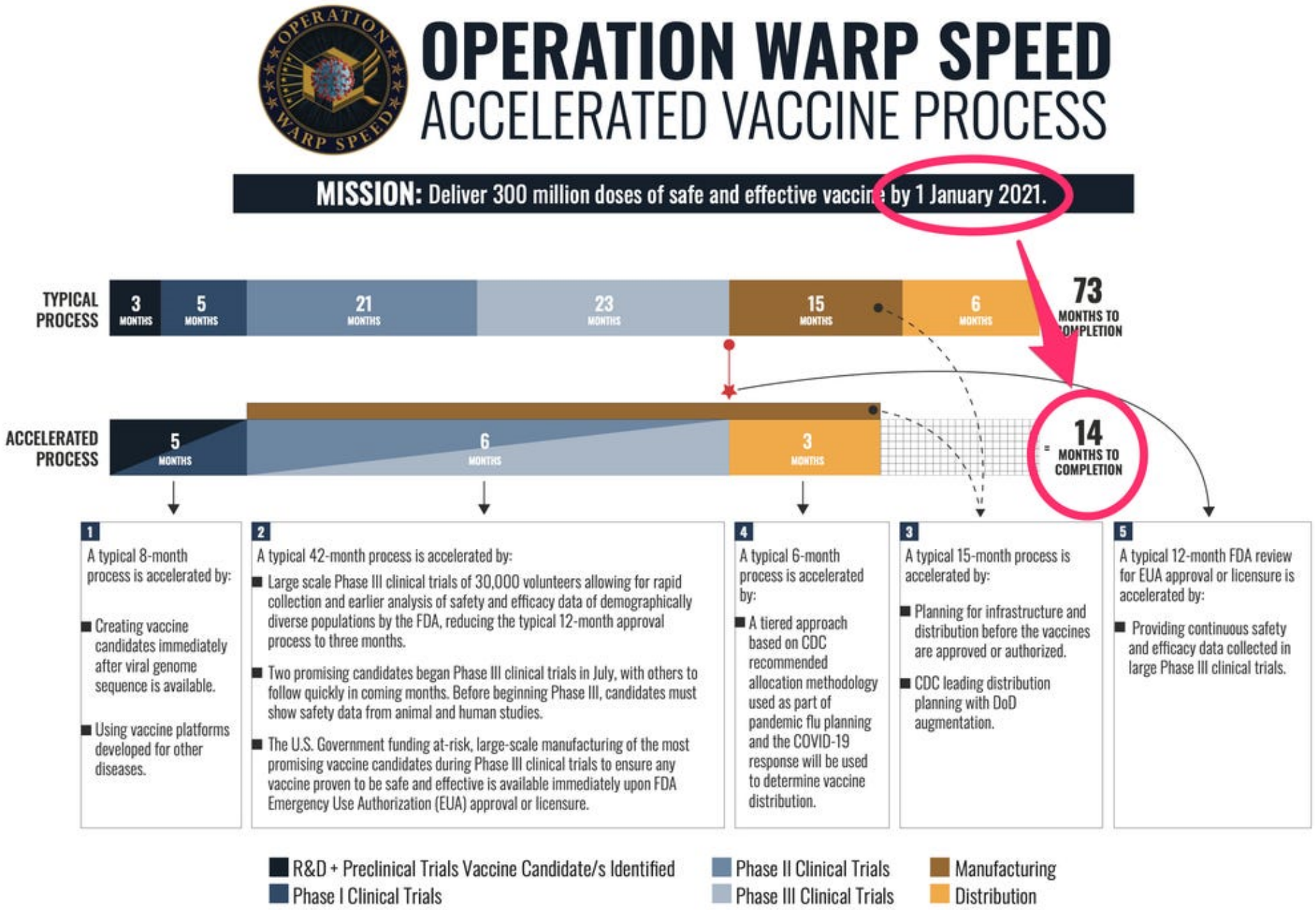
Evan J. Anderson, MD
Professor of Pediatrics and Medicine
Emory University School of Medicine
Atlanta, Georgia
16OCT2020

EMORY UNIVERSITY SCHOOL OF MEDICINE

Children's® Healthcare of Atlanta

# POTENTIAL CONFLICTS AND DISCLOSURES

- Financial compensation to Emory for clinical research:
  - Pfizer, Merck, GSK, Sanofi Pasteur, Novavax, Regeneron, PaxVax, MedImmune, Janssen, and Micron.
- I have served as consultant:
  - Abbvie, Sanofi Pasteur, and Pfizer
- Safety monitoring committee
  - Kentucky BioProcessing, Inc
- NIH funded
  - PI for the Moderna mRNA-1273 Phase I study
  - PI for the Moderna mRNA-1273 Phase 3 study




https://media.defense.gov/2020/Aug/13/2002476369/-1/-1/0/200813-D-ZZ999-100.JPG

2 mRNA

- Pfizer mRNA BNT162b2; Phase 3: Jul 27; >30K→ 44K
- Moderna mRNA-1273; Phase 3: Jul 27; 28.6K→ 30K (22K dose 2)

2 viral-vectored

- AstraZeneca ChAd-Spike; Phase 3: Aug 31; Currently on hold
- Janssen Ad26-Spike; Phase 3: Sep 23; Paused

2 S protein-based

- Novavax NVX-CoV2373
- Sanofi/GSK

# Do We Need a Vaccine for Children?

- Initial Impression: Children don't get sick (e.g., inadequate hosp., inadequate deaths)

Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China
Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention

JAMA Published online February 24, 2020

Age distribution (N = 44 672)
- ≥80 years: 3% (1408 cases)
- 30-79 years: 87% (38 680 cases)
- 20-29 years: 8% (3619 cases)
- 10-19 years: 1% (549 cases)
- <10 years: 1% (416 cases)

- Current Knowledge: Substantial burden of hospitalizations in children

## Hospitalization Rates and Characteristics of Children Aged <18 Years Hospitalized with Laboratory-Confirmed COVID-19 — COVID-NET, 14 States, March 1–July 25, 2020

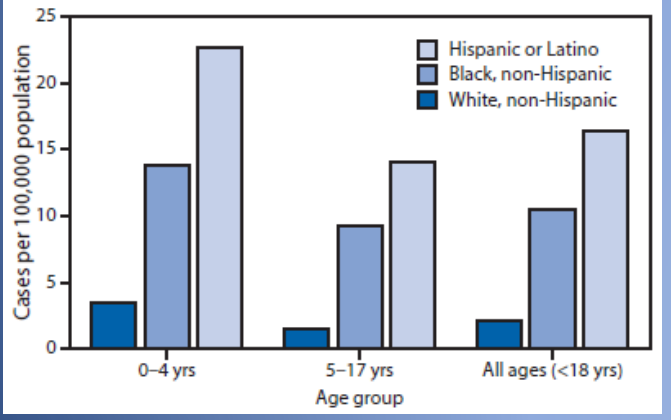
Lindsay Kim, MD[1,2]; Michael Whitaker, MPH[1,3]; Alissa O'Halloran, MSPH[1]; Anita Kambhampati, MPH[1,4]; Shua J. Chai, MD[1,5]; Arthur Reingold, MD[5,6]; Isaac Armistead, MD[7]; Breanna Kawasaki, MPH[8]; James Meek, MPH[9]; Kimberly Yousey-Hindes, MPH[9]; Evan J. Anderson, MD[10,11]; Kyle P. Openo, DrPH[11]; Andy Weigel, MSW[12]; Patricia Ryan, MSc[13]; Maya L. Monroe, MPH[13]; Kimberly Fox, MPH[14]; Sue Kim, MPH[14]; Ruth Lynfield, MD[15]; Erica Bye, MPH[15]; Sarah Shrum Davis, MPH[16]; Chad Smelser, MD[17]; Grant Barney, MPH[18]; Nancy L. Spina, MPH[18]; Nancy M. Bennett, MD[19]; Christina B. Felsen, MPH[19]; Laurie M. Billing, MPH[20]; Jessica Shiltz, MPH[20]; Melissa Sutton, MD[21]; Nicole West, MPH[21]; H. Keipp Talbot, MD[22]; William Schaffner, MD[22]; Ilene Risk, MPA[23]; Andrea Price[23]; Lynnette Brammer, MPH[1]; Alicia M. Fry, MD[1,2]; Aron J. Hall, DVM[1]; Gayle E. Langley, MD[1]; Shikha Garg, MD[1,2]; COVID-NET Surveillance Team

Morbidity and Mortality Weekly Report

## COVID-19–Associated Multisystem Inflammatory Syndrome in Children — United States, March–July 2020

Shana Godfred-Cato, DO[1]; Bobbi Bryant, MPH[1,2]; Jessica Leung, MPH[1]; Matthew E. Oster, MD[1]; Laura Conklin, MD[1]; Joseph Abrams, PhD[1]; Katherine Roguski, MPH[1]; Bailey Wallace, MPH[1,2]; Emily Prezzato, MPH[1]; Emilia H. Koumans, MD[1]; Ellen H. Lee, MD[3]; Anita Geevarughese, MD[3]; Maura K. Lash, MPH[3]; Kathleen H. Reilly, PhD[3]; Wendy P. Pulver, MS[4]; Deepam Thomas, MPH[5]; Kenneth A. Feder, PhD[6]; Katherine K. Hsu, MD[7]; Nottasorn Plipat, MD, PhD[8]; Gillian Richardson, MPH[9]; Heather Reid[10]; Sarah Lim, MBBCh[11]; Ann Schmitz, DVM[12,13]; Timmy Pierce, MPH[1,2]; Susan Hrapcak, MD[1]; Deblina Datta, MD[1]; Sapna Bamrah Morris, MD[1]; Kevin Clarke, MD[1]; Ermias Belay, MD[1]; California MIS-C Response Team

**FIGURE 2. Cumulative COVID-19-associated hospitalization rates* among children aged <18 years, by age group and race/ethnicity — COVID-NET, 14 states†, March 1–July 25, 2020§,¶**




| Virus | Hospitalizations/year |
|---|---|
| COVID-19 | 19 per 100,000 age 0-4 yrs<br>11 per 100,000 age 5-17 yrs<br>Through 10/3/2020 |
| Varicella | 4–31 per 100,000<br>Age <20 yrs<br>Years 1988–1995 |
| Rubella | Not available‡ |
| Hepatitis A† | 107 hospitalized children<br>Age <15 yrs<br>Year 2005 |

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

## Multisystem Inflammatory Syndrome in U.S. Children and Adolescents

L.R. Feldstein, E.B. Rose, S.M. Horwitz, J.P. Collins, M.M. Newhams, M.B.F. Son, J.W. Newburger, L.C. Kleinman, S.M. Heidemann, A.A. Martin, A.R. Singh, S. Li, K.M. Tarquinio, P. Jaggi, M.E. Oster, S.P. Zackai, J. Gillen, A.J. Ratner, R.F. Walsh, J.C. Fitzgerald, M.A. Keenaghan, H. Alharash, S. Doymaz, K.N. Clouser, J.S. Giuliano, Jr., A. Gupta, R.M. Parker, A.B. Maddux, V. Havalad, S. Ramsingh, H. Bukulmez, T.T. Bradford, L.S. Smith, M.W. Tenforde, C.L. Carroll, B.J. Riggs, S.J. Gertz, A. Daube, A. Lansell, A. Coronado Munoz, C.V. Hobbs, K.L. Marohn, N.B. Halasa, M.M. Patel, and A.G. Randolph, for the Overcoming COVID-19 Investigators and the CDC COVID-19 Response Team*

Modified from: Anderson EJ, Campbell JD, et al. Warp Speed for COVID-19 Vaccines: Why are Children Stuck in Neutral? CID 2020 doi: 10.1093/cid/ciaa1425

# Do We Need a Vaccine for Children?

- Initial Impression: Children don't get sick (e.g., inadequate hosp., inadequate deaths)

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Age distribution (N = 44 672)
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- <10 years: 1% (416 cases)

- Current Knowledge: Substantial number of COVID-19-related deaths in children

Image underscoring current knowledge for hospitalizations in children

| Virus | Deaths |
|---|---|
| COVID-19 | 119 children<br>Age ≤18 yrs<br>Through 10/3/2020 |
| Varicella | 50 children per year<br>Age <15 yrs<br>Years 1970–1994 |
| Rubella | 17 children per year<br>All ages<br>Years 1966–1968 |
| Hepatitis A† | 3 children per year<br>Age <20 yrs<br>Years 1990–1995 |
| Rotavirus | 20–60 children per year<br>Age <5 yrs<br>Years 1999–2007 |
| Influenza | 110-180 children per year<br>Years 2016 – 2020 |

Modified from: Anderson EJ, Campbell JD, et al. Warp Speed for COVID-19 Vaccines: Why are Children Stuck in Neutral? CID 2020 doi: 10.1093/cid/ciaa1425

- Substantial non-medical direct impact upon children by COVID-19
  - Education (e.g., online learning), extracurricular activities (e.g., sports, drama, music, social events), economic, and the emotional and psychological development of children

# Do We Need a Vaccine for Children?

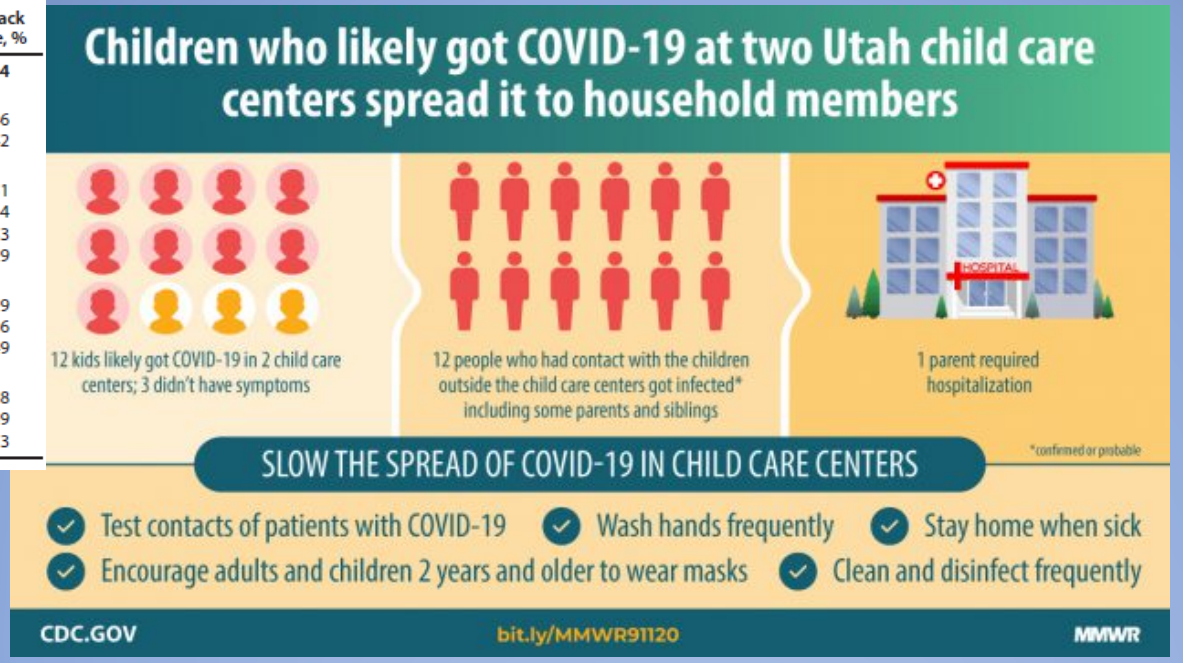
- Initial Impression: Children don't transmit virus
  - Less frequently symptomatic, uncertainty about impact of school closures
- Current Knowledge: Children are potential transmitters

## SARS-CoV-2 Transmission and Infection Among Attendees of an Overnight Camp — Georgia, June 2020

Christine M. Szablewski, DVM[1,2]; Karen T. Chang, PhD[2,3]; Marie M. Brown, MPH[1]; Victoria T. Chu, MD[2,3]; Anna R. Yousaf, MD[2,3]; Ndubuisi Anyalechi, MD[1]; Peter A. Aryee, MBA[1]; Hannah L. Kirking, MD[2]; Maranda Lumsden[1]; Erin Mayweather[1]; Clinton J. McDaniel, MPH[2]; Robert Montierth, PharmD[2]; Asfia Mohammed[1]; Noah G. Schwartz, MD[2,3]; Jaina A. Shah[1]; Jacqueline E. Tate, PhD[2]; Emilio Dirlikov, PhD[2]; Cherie Drenzek, DVM[1]; Tatiana M. Lanzieri, MD[2]; Rebekah J. Stewart, MSN, MPH[2]

**TABLE. SARS-CoV-2 attack rates*,† among attendees of an overnight camp, by selected characteristics — Georgia, June 2020**

| Characteristic | No.§ | No. positive | Attack rate, % |
|---|---|---|---|
| **Total** | **597** | **260** | **44** |
| **Sex** | | | |
| Male | 267 | 123 | 46 |
| Female | 330 | 137 | 42 |
| **Age group, yrs** | | | |
| 6–10 | 100 | 51 | 51 |
| 11–17 | 409 | 180 | 44 |
| 18–21 | 81 | 27 | 33 |
| 22–59 | 7 | 2 | 29 |
| **Type of attendee (dates attended camp)** | | | |
| Trainee (June 17–21) | 134 | 26 | 19 |
| Staff member (June 17–27¶,**) | 117 | 66 | 56 |
| Camper (June 21–27¶) | 346 | 168 | 49 |
| **Cabin size during camp†† (no. of persons/cabin)§§** | | | |
| Small (1–3) | 13 | 5 | 38 |
| Medium (7–13) | 75 | 29 | 39 |
| Large (16–26) | 375 | 200 | 53 |

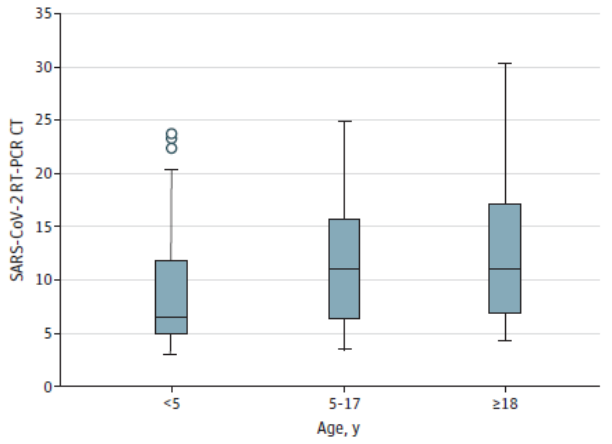



## Letters

RESEARCH LETTER

### Age-Related Differences in Nasopharyngeal Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Levels in Patients With Mild to Moderate Coronavirus Disease 2019 (COVID-19)

Figure. Distribution of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Reverse Transcriptase–Polymerase Chain Reaction (RT-PCR) Amplification Cycle Threshold (CT) Values From Nasopharyngeal Swabs Collected From Patients With Coronavirus Disease 2019




Children younger than 5 years had significantly lower CT values compared with children aged 5 to 17 years ($P = .02$) and adults 18 years and older ($P = .001$). CT values were similar between children aged 5 to 17 years and adults 18 years and older ($P = .34$). Midlines indicate the median, boxes indicate interquartile ranges, whiskers indicate the upper and lower adjacent values (within 1.5-fold the interquartile range), and isolated data points indicate outliers.

# Do We Need a Vaccine for Children?

- Current Knowledge: Children are potential transmitters
  - Impact upon parents (including pregnant mothers), grandparents, other family members
  - Impact upon schoolteachers and staff, others

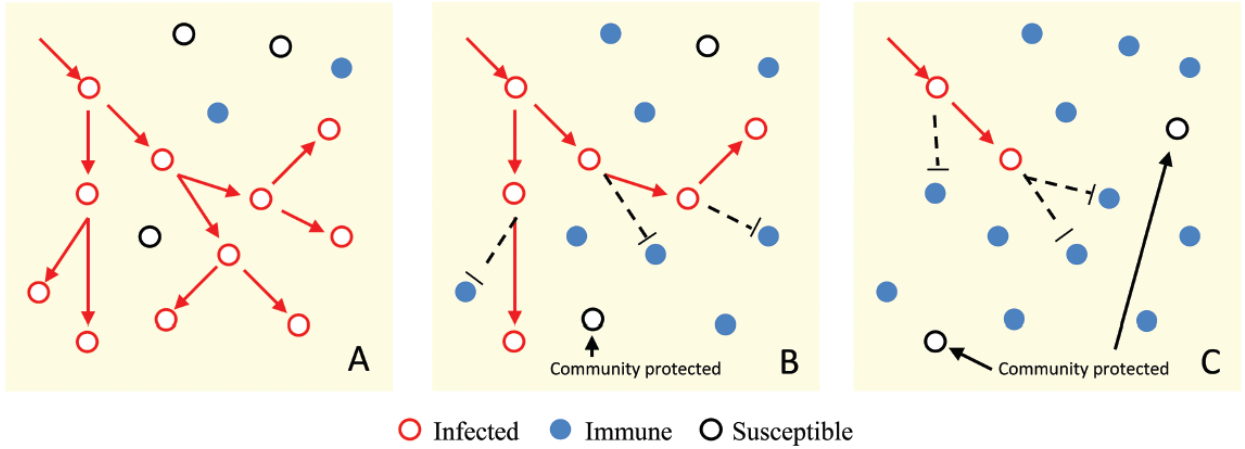



**Figure 2.** Transmission of a pathogen with a basic reproduction number of 2 in a population. *A*, If 12.5% of the population is immune, pathogen transmission increases exponentially for each generation (until previously infected individuals accumulate). *B*, If a 50% immunity level is achieved, transmission is impaired, and community protection can be observed. *C*, If 75% of the population is immune, transmission will be limited and will ultimately cease. Revised from Fine et al [10], with permission

*Clinical Infectious Diseases*

REVIEW ARTICLE

IDSA Infectious Diseases Society of America · hivma hiv medicine association · OXFORD

## Protecting the Community Through Child Vaccination

Evan J. Anderson,[1,2,a] Michael A. Daugherty,[1,3,a] Larry K. Pickering,[1] Walter A. Orenstein,[2,3] and Ram Yogev[4]

Departments of [1]Pediatrics and [2]Medicine, Emory University School of Medicine, and [3]Rollins School of Public Health, Emory University, Atlanta, Georgia, and [4]Department of Pediatrics, Northwestern University Feinberg School of Medicine, Chicago, Illinois

*Clinical Infectious Diseases*

VIEWPOINTS

IDSA Infectious Diseases Society of America · hivma hiv medicine association · OXFORD

## The Importance of Advancing Severe Acute Respiratory Syndrome Coronavirus 2 Vaccines in Children

Carol M. Kao,[1,2] Walter A. Orenstein,[2,3] and Evan J. Anderson,[1,2]

[1]Department of Pediatrics, Emory University School of Medicine, Emory + Children's Pediatric Institute, Atlanta, Georgia, USA, [2]Department of Medicine, Emory University School of Medicine,

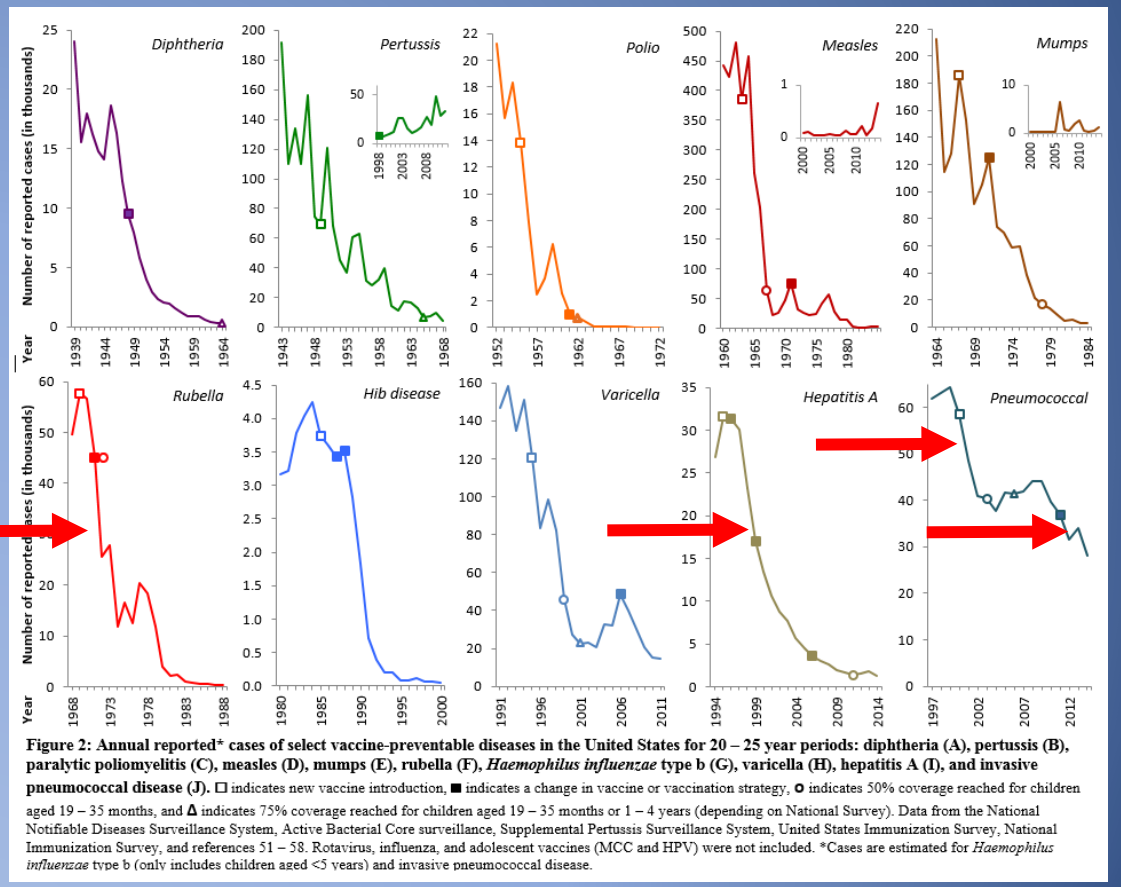



**Figure 2: Annual reported* cases of select vaccine-preventable diseases in the United States for 20 – 25 year periods: diphtheria (A), pertussis (B), paralytic poliomyelitis (C), measles (D), mumps (E), rubella (F), *Haemophilus influenzae* type b (G), varicella (H), hepatitis A (I), and invasive pneumococcal disease (J).** □ indicates new vaccine introduction, ■ indicates a change in vaccine or vaccination strategy, ○ indicates 50% coverage reached for children aged 19 – 35 months, and Δ indicates 75% coverage reached for children aged 19 – 35 months or 1 – 4 years (depending on National Survey). Data from the National Notifiable Diseases Surveillance System, Active Bacterial Core surveillance, Supplemental Pertussis Surveillance System, United States Immunization Survey, National Immunization Survey, and references 51 – 58. Rotavirus, influenza, and adolescent vaccines (MCC and HPV) were not included. *Cases are estimated for *Haemophilus influenzae* type b (only includes children aged <5 years) and invasive pneumococcal disease.

# Summary: Do We Need a Vaccine for Children?

- Direct burden upon children
  - Hospitalization
    - Exceeds that observed in the pre-vaccine era for several other viruses for which we now have vaccines (e.g., hepatitis A, varicella)
    - Disproportionate impact upon non-White children
    - MIS-C impact upon children with potential long-term consequences (e.g., cardiac)
  - Mortality – in 7 months
    - Exceeds that of pre-vaccine burden of deaths for rotavirus, hepatitis A, varicella, rubella
    - Has reached annual influenza burden of hospitalizations (110 – 180/season)
  - Substantial non-medical direct impact upon children by COVID-19
    - Education (e.g., online learning), extracurricular activities (e.g., sports, drama, music, social events), and the emotional and psychological development of children
- Indirect impact of COVID-19 from pediatric disease
  - Birth cohort of ~3.7 million/year
  - Clearly can transmit virus to their contacts
  - Importance of pediatric vaccination in prevention of disease in adults
    - PCV7/13, rotavirus, hepatitis A, rubella

**YES**

# Start Initial Studies in Children Now

- Why pediatric studies?
  - Differences in height, weight, body surface area, muscle mass, and fat distribution in children
    - Dose could very well differ, particularly in young children
  - Need to understand reactogenicity, safety, and immunogenicity in children + establish the dose
- Current status:
  - Single US study expanded Phase 3 enrollment down to age 16
  - Some plans in Europe (AZ, Janssen), no manufacturer has fully committed to starting a US study now
  - Typical response: *"…we will begin pediatric studies after safety and efficacy is established in adults…"*
- Reminder
  - Adult phase 1/2 COVID-19 studies conducted **in parallel** with initial animal studies → expediting of Phase 3
  - Vaccine development typically starts with a small Phase 1 study of healthy young adults
  - For pediatric vaccines, the Phase 2 and 3 studies usually occur without large studies of adult safety / efficacy
    - Pediatric vaccines licensed BEFORE substantial adult data: rotavirus, mumps, polio, PCV7/13, HIB
    - Pediatric vaccines in clinical trials currently: RSV (multiple), CMV

# Start Initial Studies in Children Now

- Conduct initial studies in children in parallel with adult Phase 3 studies
  - Several of the Phase 3 candidates already have ~15,000 adults that have received ≥1 dose (placebo)
  - ~11K have received 2 doses for each of the manufacturers
- Establish safety, reactogenicity, immunogenicity, and the dose of the vaccine in children
- Safety issues in the past
  - "Swine flu" vaccine and GBS
  - Dengue: ADE
  - RSV: VAERD – antibody + T cell
- Early concerns about risk
  - No data supporting this to date
  - Seeing high neuts, Th1-biased responses
- MIS-C
  - Prevention of infection would likely

Cite as: B. S. Graham *et al.*, *Science* 10.1126/science.abb8923 (2020).

**Rapid COVID-19 vaccine development**

*By* **Barney S. Graham**

Vaccine Research Center, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD, USA. Email: bgraham@mail.nih.gov

**Potential risks associated with vaccine development for COVID-19**

Antibodies that bind virus without neutralizing infectivity can cause disease through increased viral replication or formation of immune complexes that deposit in tissue and activate complement pathways associated with inflammation. T helper 2 cell ($T_H2$)–biased responses have also been associated with ineffective vaccines that lead to enhanced disease after subsequent infection. Antibody-dependent enhancement (ADE) of viral replication has occurred in viruses with innate macrophage tropism. Virus-antibody immune complexes and $T_H2$-biased responses can both occur in vaccine-associated enhanced respiratory disease (VAERD).

| | *(Dengue vaccine)* Antibody-mediated | | *(RSV vaccine-formalin)* T cell–mediated |
|---|---|---|---|
| | *Feline infectious peritonitis virus (FIPV)* ADE | VAERD | VAERD |
| Mechanism | Fc-mediated increase in viral entry | Immune complex formation and complement deposition | $T_H2$-biased immune response |
| Effectors | Macrophage activation and inflammatory cytokines | Complement activation and inflammatory cytokines | Allergic inflammation and $T_H2$ cytokines |
| Mitigation | Conformationally correct antigens and high-quality neutralizing antibody | | $T_H1$-biasing immunization and $CD8^+$ T cells |

# Start Initial Studies in Children Now

- Differences in height, weight, body surface area, muscle mass, and fat distribution in children – could impact dosing
- Vaccine development typically starts with a small Phase 1 study of healthy young adults
- For pediatric vaccines, the Phase 2 and 3 studies usually occur without large studies of adult safety / efficacy
- Conduct initial studies in children in parallel with adult Phase 3 studies
  - Reality – markedly delayed
- Already have far more data than typically would be needed to begin pediatric studies
- Studies will need to be carefully conducted


Emory University
CORONAVIRUS PANDEMIC
THE SEARCH FOR A VACCINE
CNN
AC360°

# Acknowledgements


- Slides – Nadine Rouphael, Colleen Kelly, Carlos del Rio
- Initial discussion:
  - Carol “Mimi” Kao
  - Walt Orenstein
- Advanced discussion:
  - Jim Campbell
  - C. Buddy Creech
  - Robert Frenck
  - Satoshi Kamidani
  - Flor Munoz
  - Sharon Nachman
  - Paul Spearman


Rush ‘Freewill’

*“If you choose not to decide*
*You still have made a choice*
*You can choose from phantom fears*
*And kindness that can kill…”*

# Supplemental Slides

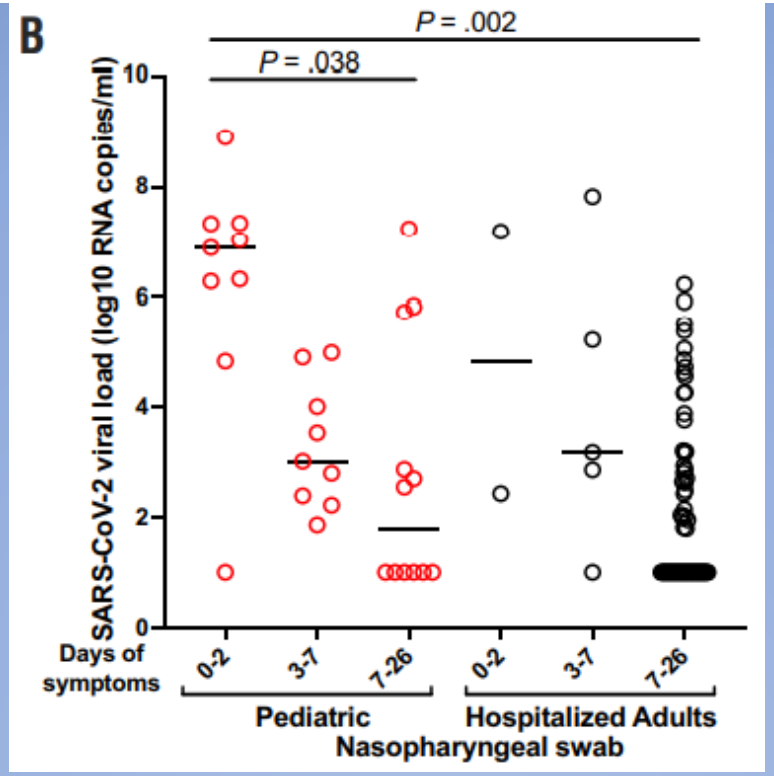
# Do We Need a Vaccine for Children?

- Initial Impression: Kids don't transmit virus
  - Less frequently symptomatic, uncertainty about impact of school closures
- Current Knowledge: Kids are potential transmitters

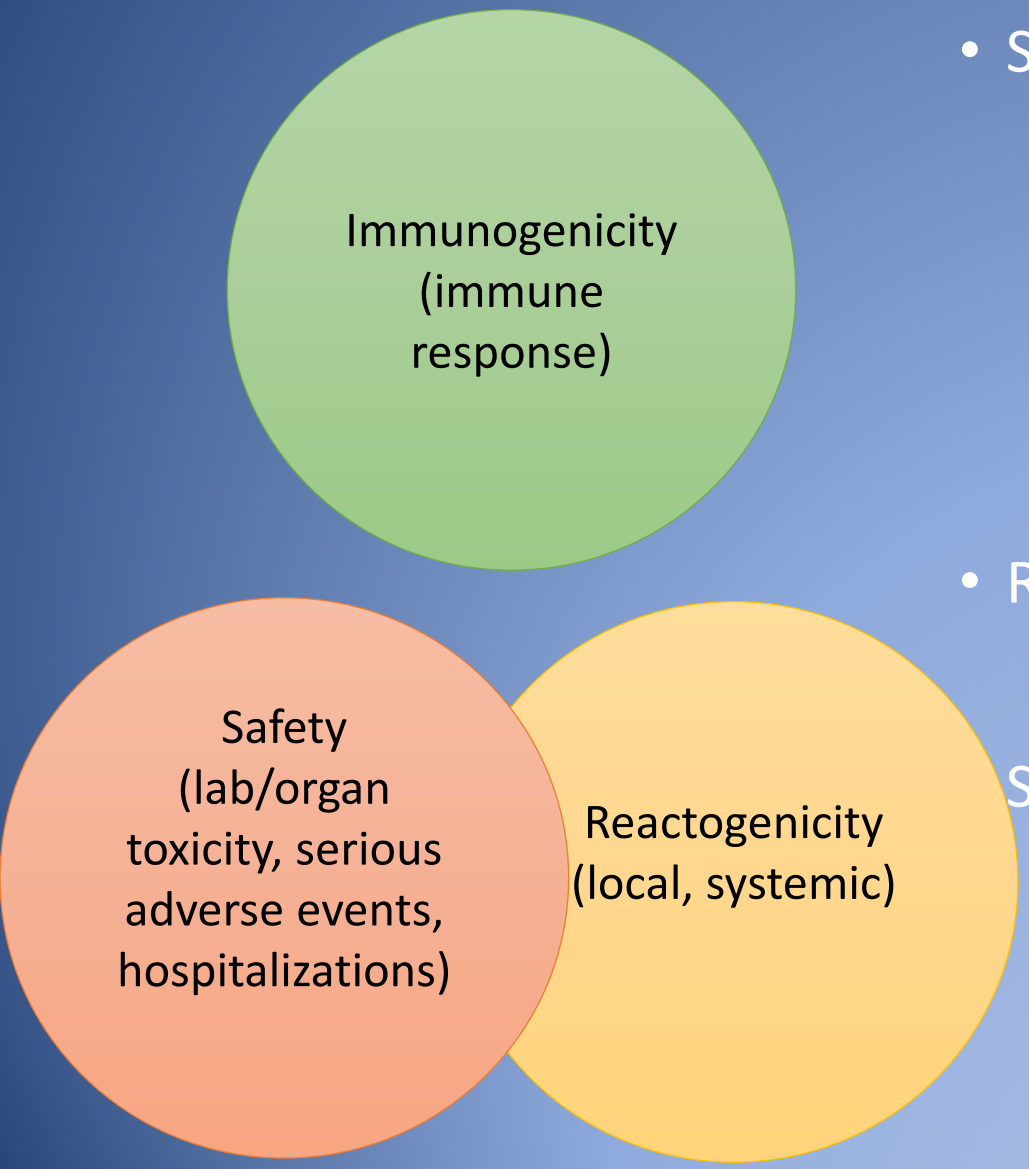
THE JOURNAL OF PEDIATRICS • www.jpeds.com ORIGINAL ARTICLES

**Pediatric Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2): Clinical Presentation, Infectivity, and Immune Responses**

Lael M. Yonker, MD[1,2,3], Anne M. Neilan, MD[2,3,4], Yannic Bartsch, PhD[3,5], Ankit B. Patel, MD, PhD[3,6], James Regan, BS[7],



# Vaccine Development




- Need immunogenicity (immune response)
- Safety ≠ Reactogenicity
  - General philosophical approach has been to minimize reactogenicity
    - A safe vaccine can have substantial reactogenicity (e.g., Shingrix)
  - Reactogenic vaccines can have better immunological responses
    - Whole cell pertussis versus acellular, new shingles vaccine
- Reactogenicity can overlap with safety
  - E.g., febrile seizures, dehydration, syncopy

Speed of development and safety can coexist

- Safety is a critical goal for vaccines as vaccines are given to otherwise healthy people
  - Once you administer a vaccine, you can't take it back
  - Sentinel subjects and pauses in enrollment, small numbers, and dose escalation

**Barry Bloom, PhD**
Harvard University
Harvard T.H. Chan School of Public Health

NVAC

CVD·GH

CENTER FOR VACCINE DEVELOPMENT AND GLOBAL HEALTH

UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE
CENTER FOR VACCINE DEVELOPMENT
AND GLOBAL HEALTH

# Evaluation of COVID-19 Vaccines in Children

***Testimony***
***before the***
***National Vaccine Advisory Committee***

*James D. Campbell, MD, MS*
*Professor, Pediatrics*
*October 16, 2020*

UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE
CENTER FOR VACCINE DEVELOPMENT
AND GLOBAL HEALTH

# Disclosures

- I am principal investigator or investigator of vaccine or drug trials sponsored by Merck, GSK, Pfizer, Sanofi, Moderna, and Novavax. All sponsors have provided funds to the university for the sole purpose of execution of the studies I have and am performing; funds are not directly provided to me.
- I serve on data and safety monitoring boards for Sanaria, the manufacturer of experimental malaria vaccines.

# Key Points

- Pediatric burden of disease and epiphenomena
- Disproportionate burden among children in minority communities
- Unethical to wait for natural “herd” effects
- Indirect effects to the child and society
- Prevent disease- prevent sequelae
- Most successful immunization programs are universal pediatric recommendations
- Taxpayer investment and advocacy for children
- Conundrum for families and providers if safe and effective vaccines available for adults but no data in children
- Safety concerns are best addressed in clinical trials
- “Catch-22”: recommending bodies, sponsors, regulators

# Letter from the AAP President

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

*90 Years of Caring for Children—1930–2020*

September 29, 2020

Alex Azar, JD
Secretary
U.S. Department of Health and Human Services
200 Independence Avenue, SW
Washington, DC 20201

Stephen M. Hahn, M.D.
Commissioner
U.S. Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993

Dear Secretary Azar and Commissioner Hahn:

# Letter from the AAP President

- AAP represents 67,000 providers of healthcare to children
- Fear, mistrust, and misinformation about a potential SARS-CoV-2 vaccine
  - Loss of trust jeopardizes this vaccine and all vaccines
- …"how crucial it is for children to be included in vaccine trials of SARS-CoV-2 vaccines."
- Letter refers to the potential direct and indirect benefits of the vaccines.
- It is "counter to the ethical principle of distributive justice to allow children to take on great burdens during this pandemic" without "the opportunity to benefit from a vaccine, or to delay that benefit" because they are not included in trials.
- Urges careful trials with rigorous oversight and review.

# NIH Bioethics Consult



***Bioethics Consultation Service Consultation Report***

***Date of Consultation Request:*** 8-25-20

***Date of Report***: 9-9-2020

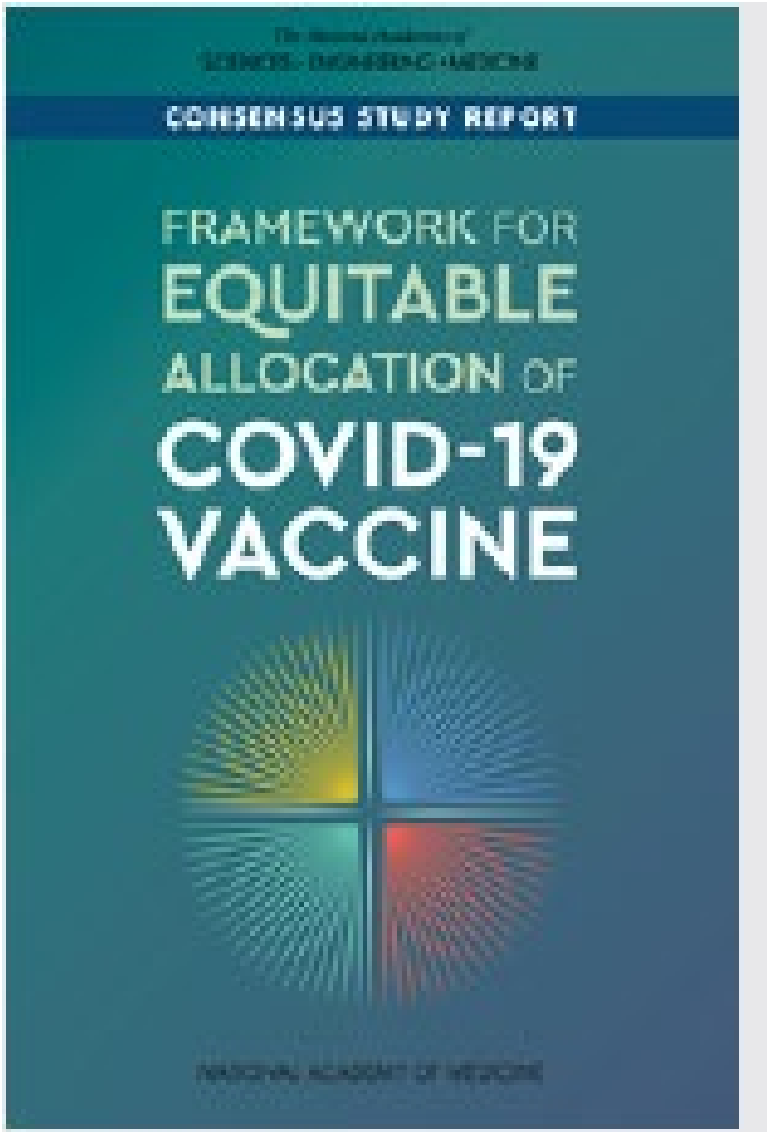
***Requestor:*** Emily Erbelding, M.D., M.P.H., Director, Division of Microbiology and Infectious Diseases, NIAID

***Reason for Consultation:*** To consider whether or not it is ethically justifiable to conduct pediatric SARS-CoV-2 vaccine trials before adult trials are completed.

# NIH Bioethics Consult

- #1 recommendation “initiation of SARS-CoV-2 vaccine [trials] in children before completion of adult efficacy trials ***is ethically preferable*** in light of considerations of justice. Doing so would avoid substantially delaying access for children to the benefits of a safe and effective vaccine.”
- Prioritization of vaccines and stringent study design, including age de-escalation, are important.
- Strive for geographic and demographic diversity.
- MIS-C and other events predicted not to exceed rare occurrences should be studied in post-marketing surveillance.

# Report by the National Academies




**Framework for Equitable Allocation of COVID-19 Vaccine**

Helene Gayle, William Foege, Lisa Brown, and Benjamin Kahn, *Editors*

Committee on Equitable Allocation of Vaccine for the Novel Coronavirus

Board on Health Sciences Policy

Board on Population Health and Public Health Practice

Health and Medicine Division

A Consensus Study Report of

*The National Academies of*
SCIENCES • ENGINEERING • MEDICINE

and

NATIONAL ACADEMY OF MEDICINE

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*Washington, DC*
**www.nap.edu**

CENTER FOR VACCINE DEVELOPMENT AND GLOBAL HEALTH

# Report by the National Academies

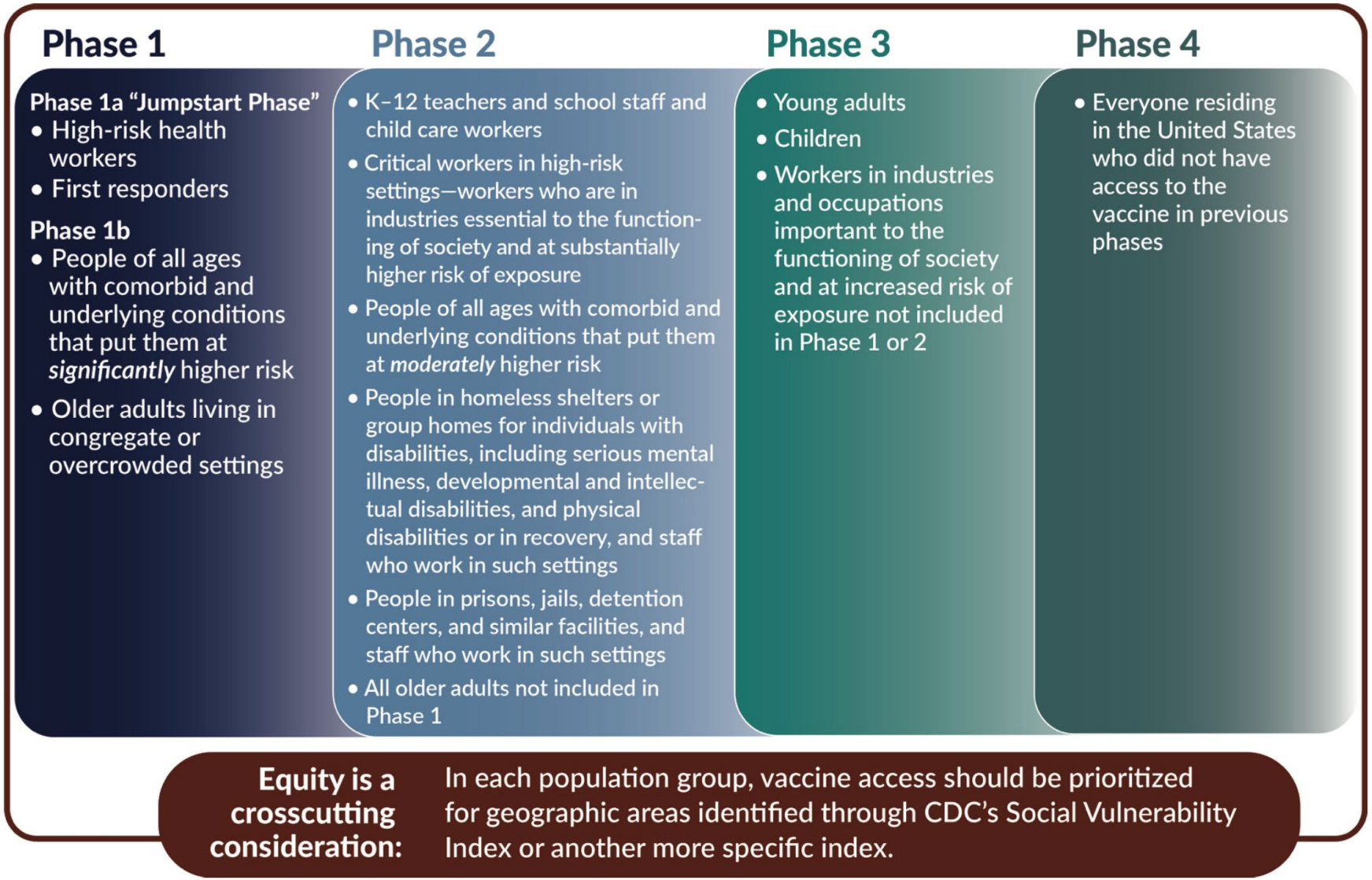


**FIGURE S-2** A phased approach to vaccine allocation for COVID-19.

# Sample Sizes of Trials

- Recently licensed pediatric vaccines (endemic, not pandemic)
  - HPV, VZV, MenACWY, MenB, HepA
  - Range from ~3000 to about 15,000 enrolled
- How many must enroll to have confidence that the true rate of an untoward event is below a threshold, when there are no events in a study?

| Exposed children | 95% confident the rate is no greater than | 99% confident the rate is no greater than |
|---|---|---|
| 500 | 1 in 132 | 1 in 95 |
| 1000 | 1 in 263 | 1 in 189 |
| 3000 | 1 in 769 | 1 in 556 |
| 10000 | 1 in 2500 | 1 in 2000 |
| 30000 | 1 in 10,000 | 1 in 5000 |

# Conclusion

- Carefully designed age de-escalation immuno-bridging studies of COVID-19 vaccines should begin now.
- The number of children enrolled should allow for bridging and capturing of uncommon, but not rare adverse events.
- Transparency will foster trust.
- Systems for post-authorization large-scale safety surveillance are available but their deployment for SARS-CoV-2 vaccines must be fully described and utilized.
- We have been implementing this paradigm for decades with excellent success.

# Acknowledgments


- **Academic Colleagues**: Kathy Neuzil, Karen Kotloff, Evan Anderson, Paul Spearman, C. Buddy Creech, Bob Frenck, Flor Munoz, Sharon Nachman, Walt Orenstein, Kathy Edwards, Satoshi Kamidani
- **NIAID collaborators**
- **IDCRC** and **VTEU** leadership; **FHI360-** Linda McNeil and Ashley Miller
- **Colleagues on the COID** of the AAP (the Red Book) and AAP leadership
- The **Maternal-Child Clinical Trials Section at the CVD** and everyone at the CVD who engages with me in discussions on the topic of SARS-CoV-2 vaccines in children

# Thank You

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Visit us online at www.medschool.umaryland.edu/cvd

UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE
CENTER FOR VACCINE DEVELOPMENT
AND GLOBAL HEALTH

Infectious Diseases Clinical Research Consortium

VTEUs

National Institute of Allergy and Infectious Diseases

# *Lessons from COVID-19 Vaccine Development*

**David S Stephens MD**

Emory University

**Kathleen Neuzil MD**

University of Maryland School of Medicine


Jan 21st, 2020

# Vaccine Treatment and Evaluation Units

Infectious Diseases Clinical Research Consortium

- Established by NIAID in 1962
- Mandate: Conduct clinical trials of vaccines and treatments for infectious diseases
- **VTEUs are leaders in testing vaccines for US, international populations.**
  - Central to the response to emerging infections, including H1N1 influenza, avian influenza strains, Zika and now COVID-19
  - Key role in testing of routine childhood, adult and maternal vaccines
  - Pivotal contributions to vaccine science, including immunology, genomics and transcriptomics and human controlled infection models
- VTEU investigators hold leadership positions in vaccine science, policy, and regulatory committees and professional organizations
- IDCRC/VTEU Network formed Dec 2019

**VTEUs have played a key role in the NIAID effort to develop new and improved vaccines and therapies against infectious diseases for over four decades.**

NIH National Institute of Allergy and Infectious Diseases

# mRNA-1273 COVID-19 Vaccine Timeline

- Jan 11th Chinese authorities share genetic sequence of SARS-CoV-2.
- Jan 13th NIAID and Moderna finalized sequence for pre-fusion spike protein stabilized mRNA-1273. Manufacturing initiated.
- Jan 21st NIAID charge to conduct Phase-1 trial with IDCRC/VTEU
- Mar 16th Phase-1 starts Kaiser-Washington VTEU, **63** days
- Mar 27th Emory VTEU began enrolling healthy adult volunteers ages 18 to 55 years in the NIH-led Phase 1 study of mRNA-1273.
- Apr 16th Three cohorts of older adults (ages 56 -70) and three cohorts of elderly adults (age 71 and above) enrolling.
- May 29th Moderna (BARDA) Phase-2, **137** days


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Infectious Diseases Clinical Research Consortium

# Lessons from COVID-19 Vaccine Development

Promote innovation, shorten timelines, increase availability to population

- **Importance of Wide-Ranging Fundamental Science**: viral pathogenesis- SARS-1, MERS, RSV; basic immunology (Th1), vaccine "enhanced" disease, antigen delivery, correlates of protection, adjuvants
- **Role of Preclinical Science-** NHP data, established animal models
- **Experience in Humans with New Vaccine Platforms and Adjuvants**
  - Partnerships: Academia/Public/Private
  - mRNA: Ebola, Zika, Influenza, SARS, spike stabilization
  - Ad Vectors: Ad26, ChAdOx
  - Protein/Adjuvants: Spike (viral fusion) proteins/ Saponin-Matrix-M, LNPs, ASO3
- **Resources**
  - Human, financial and clinical trials infrastructure, FDA
- **Public-Private Partnerships for Rapid Design and Launch of Phase I Clinical Trials-** Validation Neutralization Assays

IDCRC
Infectious Diseases Clinical Research Consortium

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

# An mRNA Vaccine against SARS-CoV-2 — Preliminary Report

L.A. Jackson, E.J. Anderson, N.G. Rouphael, P.C. Roberts, M. Makhene, R.N. Coler, M.P. McCullough, J.D. Chappell, M.R. Denison, L.J. Stevens, A.J. Pruijssers, A. McDermott, B. Flach, N.A. Doria-Rose, K.S. Corbett, K.M. Morabito, S. O'Dell, S.D. Schmidt, P.A. Swanson II, M. Padilla, J.R. Mascola, K.M. Neuzil, H. Bennett, W. Sun, E. Peters, M. Makowski, J. Albert, K. Cross, W. Buchanan, R. Pikaart-Tautges, J.E. Ledgerwood, B.S. Graham, and J.H. Beigel, for the mRNA-1273 Study Group*

**July 14th, 2020**

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

# Safety and Immunogenicity of SARS-CoV-2 mRNA-1273 Vaccine in Older Adults

E.J. Anderson, N.G. Rouphael, A.T. Widge, L.A. Jackson, P.C. Roberts, M. Makhene, J.D. Chappell, M.R. Denison, L.J. Stevens, A.J. Pruijssers, A.B. McDermott, B. Flach, B.C. Lin, N.A. Doria-Rose, S. O'Dell, S.D. Schmidt, K.S. Corbett, P.A. Swanson II, M. Padilla, K.M. Neuzil, H. Bennett, B. Leav, M. Makowski, J. Albert, K. Cross, V.V. Edara, K. Floyd, M.S. Suthar, D.R. Martinez, R. Baric, W. Buchanan, C.J. Luke, V.K. Phadke, C.A. Rostad, J.E. Ledgerwood, B.S. Graham, and J.H. Beigel, for the mRNA-1273 Study Group*

**eptember 29th, 2020**

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

# Evaluation of the mRNA-1273 Vaccine against SARS-CoV-2 in Nonhuman Primates

K.S. Corbett, B. Flynn, K.E. Foulds, J.R. Francica, S. Boyoglu-Barnum, A.P. Werner, B. Flach, S. O'Connell, K.W. Bock, M. Minai, B.M. Nagata, H. Anderson, D.R. Martinez, A.T. Noe, N. Douek, M.M. Donaldson, N.N. Nji, G.S. Alvarado, D.K. Edwards, D.R. Flebbe, E. Lamb, N.A. Doria-Rose, B.C. Lin, M.K. Louder, S. O'Dell, S.D. Schmidt, E. Phung, L.A. Chang, C. Yap, J.-P.M. Todd, L. Pessaint, A. Van Ry, S. Browne, J. Greenhouse, T. Putman-Taylor, A. Strasbaugh, T.-A. Campbell, A. Cook, A. Dodson, K. Steingrebe, W. Shi, Y. Zhang, O.M. Abiona, L. Wang, A. Pegu, E.S. Yang, K. Leung, T. Zhou, I-T. Teng, A. Widge, I. Gordon, L. Novik, R.A. Gillespie, R.J. Loomis, J.I. Moliva, G. Stewart-Jones, S. Himansu, W.-P. Kong, M.C. Nason, K.M. Morabito, T.J. Ruckwardt, J.E. Ledgerwood, M.R. Gaudinski, P.D. Kwong, J.R. Mascola, A. Carfi, M.G. Lewis, R.S. Baric, A. McDermott, I.N. Moore, N.J. Sullivan, M. Roederer, R.A. Seder, and B.S. Graham

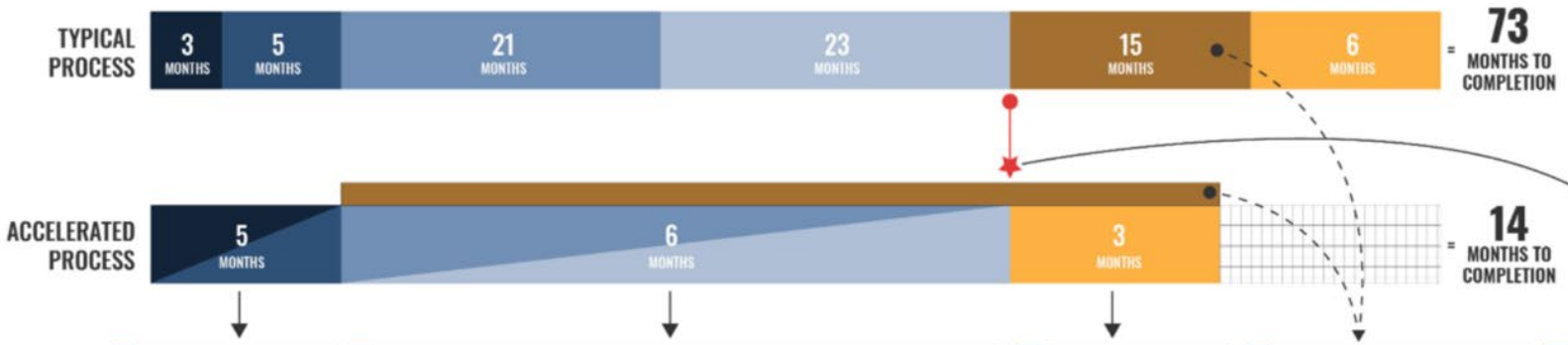
**July 29th, 2020**

NIAID VRC
NIAID DMID
Moderna
Academia: IDCRC/VTEUs

IDCRC
Infectious Diseases Clinical Research Consortium

# OPERATION WARP SPEED
## ACCELERATED VACCINE PROCESS

**MISSION:** Deliver 300 million doses of safe and effective vaccine by 1 January 2021.




**1**

A typical 8-month process is accelerated by:

- Creating vaccine candidates immediately after viral genome sequence is available.
- Using vaccine platforms developed for other diseases.

**2**

A typical 42-month process is accelerated by:

- Large scale Phase III clinical trials of 30,000 volunteers allowing for rapid collection and earlier analysis of safety and efficacy data of demographically diverse populations by the FDA, reducing the typical 12-month approval process to three months.
- Two promising candidates began Phase III clinical trials in July, with others to follow quickly in coming months. Before beginning Phase III, candidates must show safety data from animal and human studies.
- The U.S. Government funding at-risk, large-scale manufacturing of the most promising vaccine candidates during Phase III clinical trials to ensure any vaccine proven to be safe and effective is available immediately upon FDA Emergency Use Authorization (EUA) approval or licensure.

**4**

A typical 6-month process is accelerated by:

- A tiered approach based on CDC recommended allocation methodology used as part of pandemic flu planning and the COVID-19 response will be used to determine vaccine distribution.

**3**

A typical 15-month process is accelerated by:

- Planning for infrastructure and distribution before the vaccines are approved or authorized.
- CDC leading distribution planning with DoD augmentation.

**5**

A typical 12-month FDA review for EUA approval or licensure is accelerated by:

- Providing continuous safety and efficacy data collected in large Phase III clinical trials.

R&D + Preclinical Trials Vaccine Candidate/s Identified
Phase I Clinical Trials
Phase II Clinical Trials
Phase III Clinical Trials
Manufacturing
Distribution

COVID-19 Prevention Network

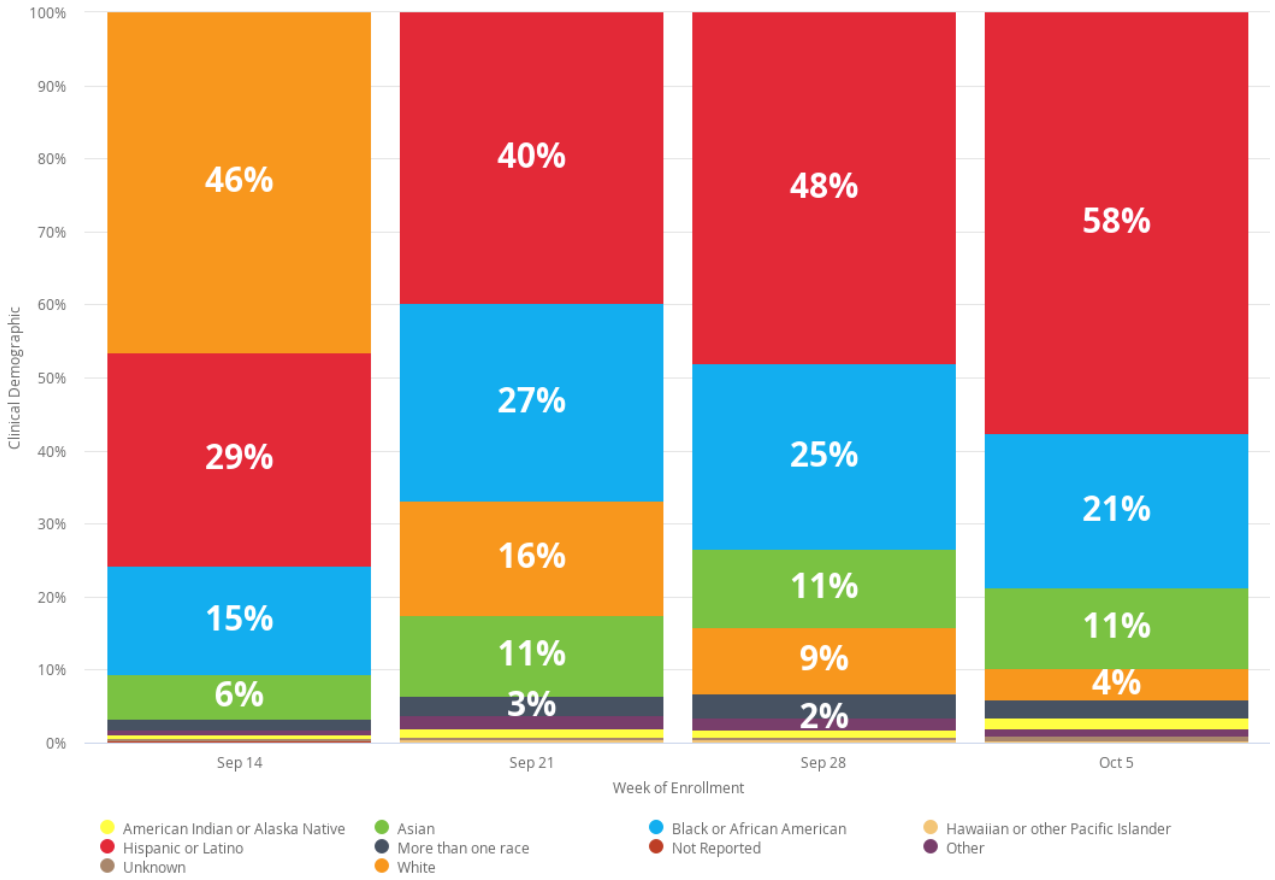
IDCRC
Infectious Diseases Clinical Research Consortium

# mRNA-1273 timeline

COVID-19 Prevention Network

**28,618 participants enrolled**
**October 9, 2020 at 5:00 pm ET**

- Jul 27th Phase 3 study of mRNA-1273 conducted in collaboration with NIH and BARDA begins. **196 days**
- July 27th -October 16th ,~30,000 participants, emphasis for diversity and for at risk groups, **277 days**
  - 34.5% of participants enrolled cumulatively are from diverse communities 10/9/20
- Pfizer BNT162 mRNA vaccine, similar speed, 44,000
- Four other Phase-3 trials underway

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# Lessons from COVID-19 Vaccine Development

Promote innovation, shorten timelines, increase availability to population

- **Public-Private Partnerships for Rapid Design and Launch of Phase III Clinical Trials**
  - Phase-1- IDCRC/VTEU
  - OWS “Warp Speed” Model- Clinical Trials- Manufacturing in parallel
  - NIH ACTIV: manufacturers, government, academic working together
  - Phase-3- CoVPN
    - Trial Design
    - Endpoints
    - Government-Academia-Industry Interface
    - Special Populations, Populations at Risk
    - Hurdles: Company held IND, CROs, Diversity Enrollment
    - Mabs- Validation of vaccine immune correlates
  - Building CoVPN Infrastructure:

COVID-19
Prevention Network

IDCRC
Infectious Diseases Clinical Research Consortium

# Lessons from COVID-19 Vaccine Development

Promote innovation, shorten timelines, increase availability to population

- **Safety and Immunogenicity-** Harmonization**;** Single DSMB, Standardization of immune assays, Adverse events.
- **Endpoints**: Symptomatic COVID illness and/or Medically complicated COVID-19 versus Prevention of Transmission, Efficacy targets, Interim analyses
- **Recruitment**: Diversity, older and at-Risk populations; epidemiology of outbreak
- **Manufacturing**: mRNA, vectors, proteins
- **Regulatory**: EUA standard (when) versus BLA, effect on other placebo controlled ongoing vaccine trials
- **Distribution**: NAM/ACIP recommendations: 200 M doses of Vaccine for 1a and 1B groups
- **Communications:** Adverse events (AZ, J&J); science by press release, server uploads and ultra-fast publications
- Global Vaccines and Vaccine Nationalism

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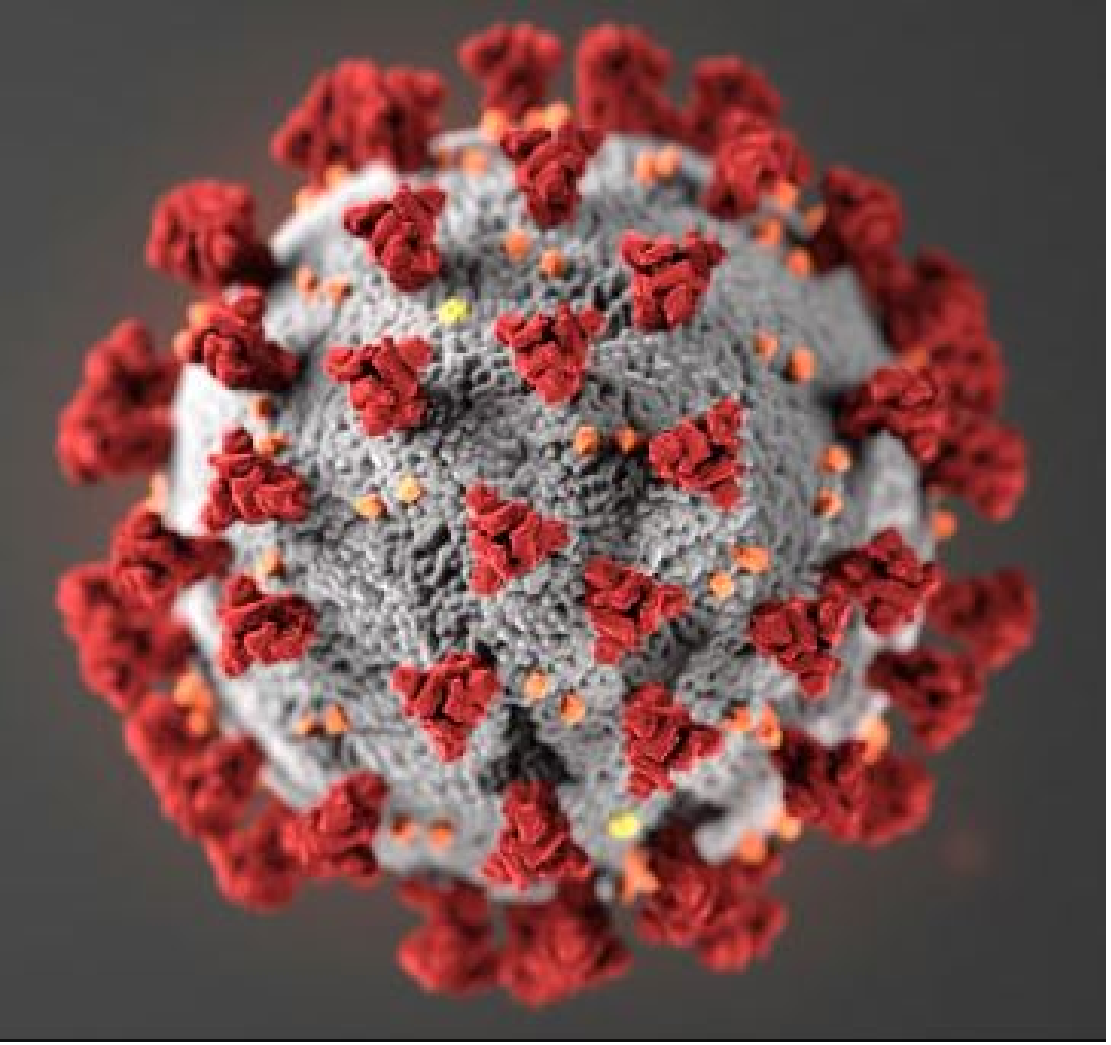
Infectious Diseases Clinical Research Consortium

**Richard Hatchett**

Coalition for Epidemic Preparedness Innovations

NVAC



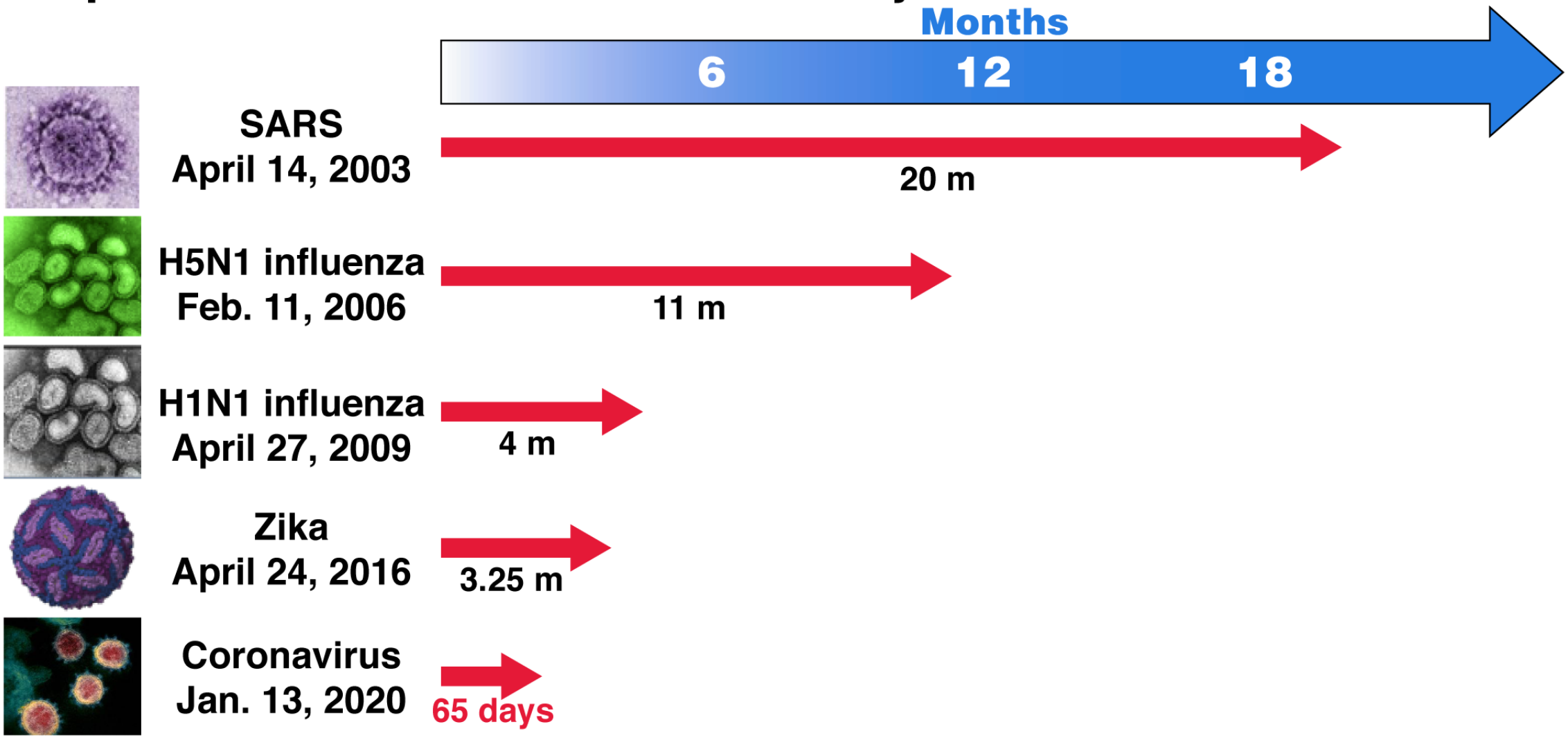
# LESSONS LEARNED: COVID-19 VACCINE DEVELOPMENT; NIH PERSPECTIVE

National Vaccine
Advisory Committee
October 16, 2020

**Karin Bok, MS, PhD**

# NIH VACCINE RESEARCH CENTER; RESPONSE TO EMERGING VIRUSES

## Sequence Selection to 1st Human Injection



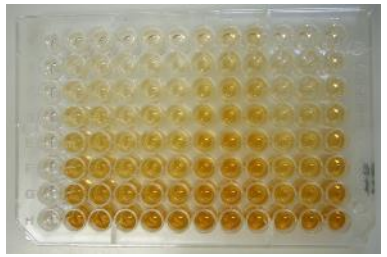
# LESSONS LEARNED

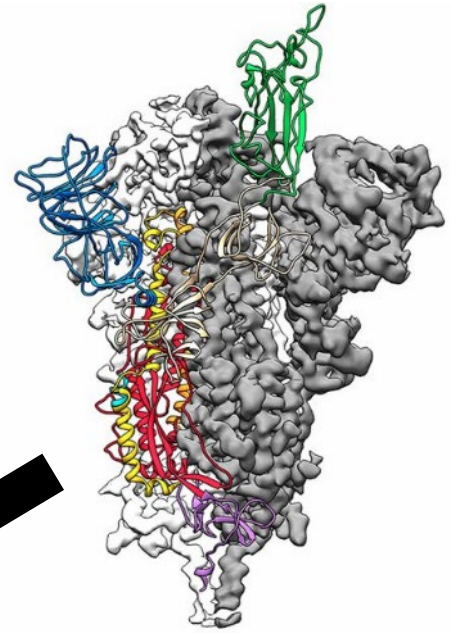
- Prototype Pathogen Preparedness Plan: Research and Development
- Cooperation and collaboration: government, industry, academia
- Advance development of strategic accelerated platforms
- Investment on platforms that have been extensively tested in past, may reduce costs and enable special populations access to countermeasures
- Coordinate and harmonize clinical testing

# HIGH QUALITY PROTEIN MATTERS: PROTOTYPE PATHOGEN PREPAREDNESS PLAN

**Therapy**


**Diagnostics**





The NEW ENGLAND JOURNAL of MEDICINE

An mRNA Vaccine against SARS-CoV-2 — Preliminary Report

Evaluation of the mRNA-1273 Vaccine against SARS-CoV-2 in Nonhuman Primates

Safety and Immunogenicity of SARS-CoV-2 mRNA-1273 Vaccine in Older Adults

**Vaccin**


*Courtesy of Barney Graham*

# FIRST IN HUMAN COVID VACCINE: MRNA 1273

2013-2019 | 2020

SARS-CoV-2 Outbreak




**2013-2019** — Extensive work on MERS and other CoV

**Dec 31, 2019** — 1st report of respiratory virus outbreak in Wuhan, China

**Jan 6, 2020** — Wuhan outbreak may be CoV

**Jan 10, 2020** — 2019-nCoV sequences published

**Jan 11, 2020** — 2019-nCoV constructs ordered

**Jan 13, 2020** — VRC decides on vaccine sequence with Moderna

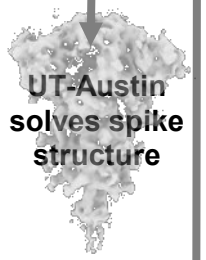
**Jan 14, 2020** — Moderna receives sequence for GMP production

**Jan 23, 2020** — DMID initiates clinical and regulatory process

**Jan 31, 2020** — VRC makes nCoV spike protein

**Feb 1, 2020** — First nCoV spike ELISA for cross-reactivity

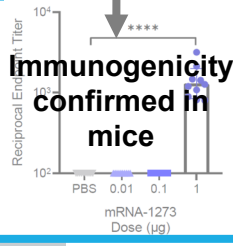
**Feb 3, 2020** — UT-Austin solves spike structure



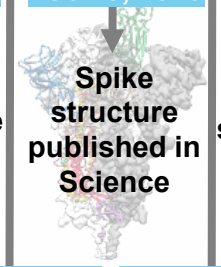
**Feb 4 2020** — VRC vaccinates mice

**Feb 4, 2020** — Moderna vials vaccine

**Feb 18, 2020** — Immunogenicity confirmed in mice




**Feb 19, 2020** — Spike structure published in Science



**Feb 20, 2020** — DMID submits IND

**Feb 21, 2020** — Moderna ships vaccine to DMID

**Mar 2, 2020** — FDA safe-to-proceed

**Mar 16, 2020** — Phase 1 Clinical trial Starts

**May 29, 2020** — Phase 2 clinical trial starts

**Jul 27, 2020** — Phase 3 Clinical trial Starts

65 days to FIH

6.5 months to phase 3

## Main Entities Involved

Dale and Betty Bumpers VACCINE RESEARCH CENTER
National Institute of Allergy and Infectious Diseases
National Institutes of Health
Department of Health and Human Services

moderna

THE UNIVERSITY OF TEXAS AT AUSTIN

DEPARTMENT OF DEFENSE — UNITED STATES OF AMERICA

BIOMEDICAL ADVANCED RESEARCH AND DEVELOPMENT AUTHORITY — BARDA

NIH NIAID

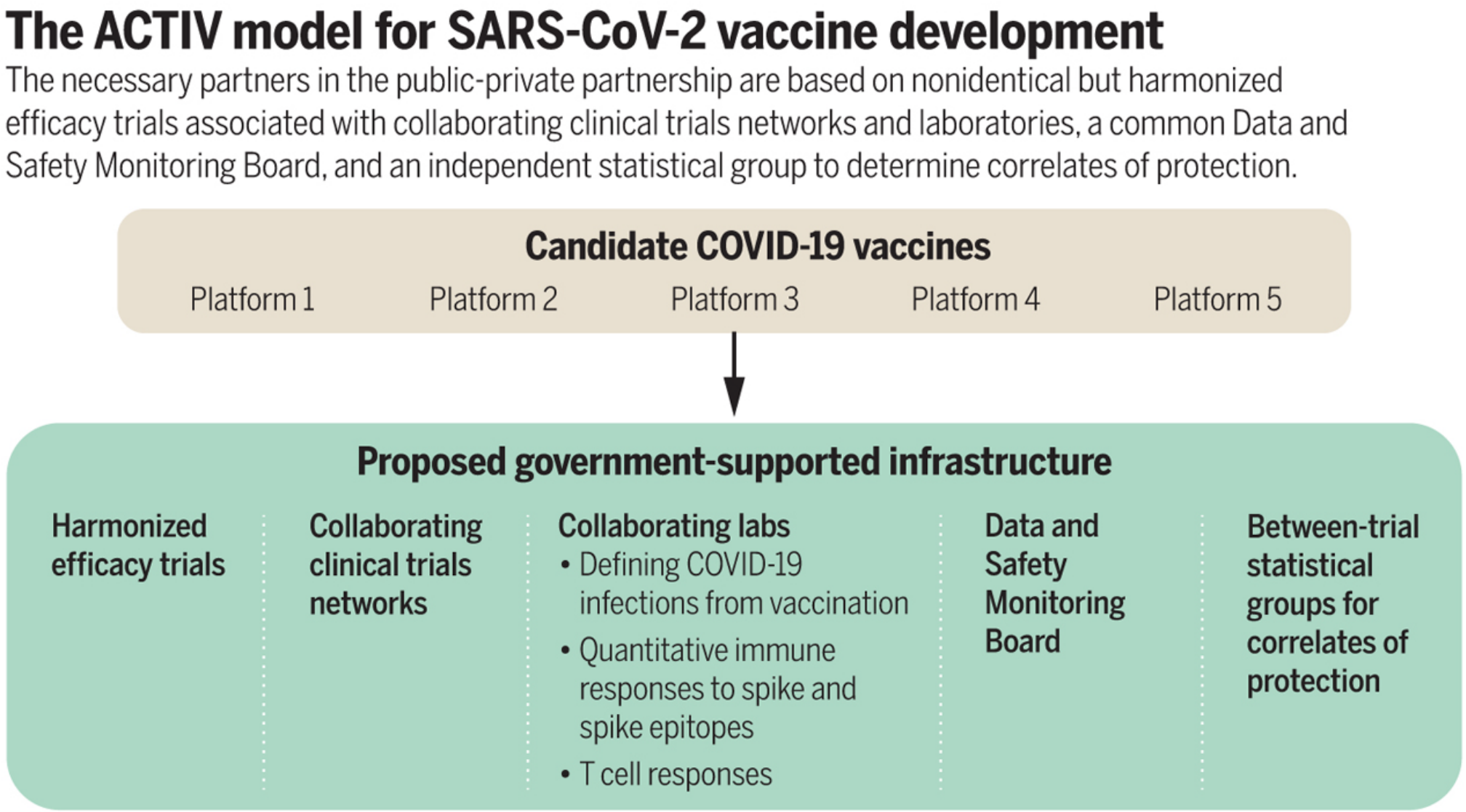
CEPI

UNC GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH

# OPERATION WARP SPEED SUPPORTED VACCINE DEVELOPMENT

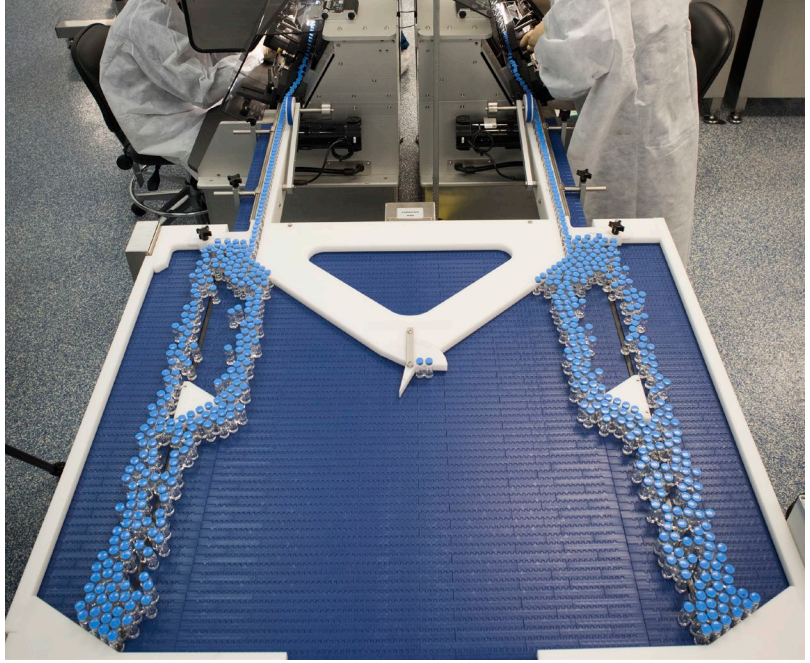
| PLATFORM | DEVELOPER | CURRENT STATUS US |
|---|---|---|
| NUCLEIC ACID (mRNA) | moderna | Phase 3 |
| | Pfizer BIONTECH | Phase 2-3 |
| VIRAL VECTOR | janssen PHARMACEUTICAL COMPANIES OF Johnson & Johnson | Phase 3 (Paused) |
| | AstraZeneca | Phase 3 (On Hold) |
| PROTEIN SUBUNIT | NOVAVAX Creating Tomorrow's Vaccines Today | Phase 2 |
| | SANOFI | Phase 1 |

# THE ACTIV MODEL FOR SARS-COV-2 VACCINE DEVELOPMENT




*Lawrence Corey et al. Science 2020;368:948-950*

Science
AAAS



AND FRON

# *What lessons can we learn from SARS-CoV-2 vaccine development?*

**Florian Krammer**

**Mount Sinai Professor in Vaccinology**

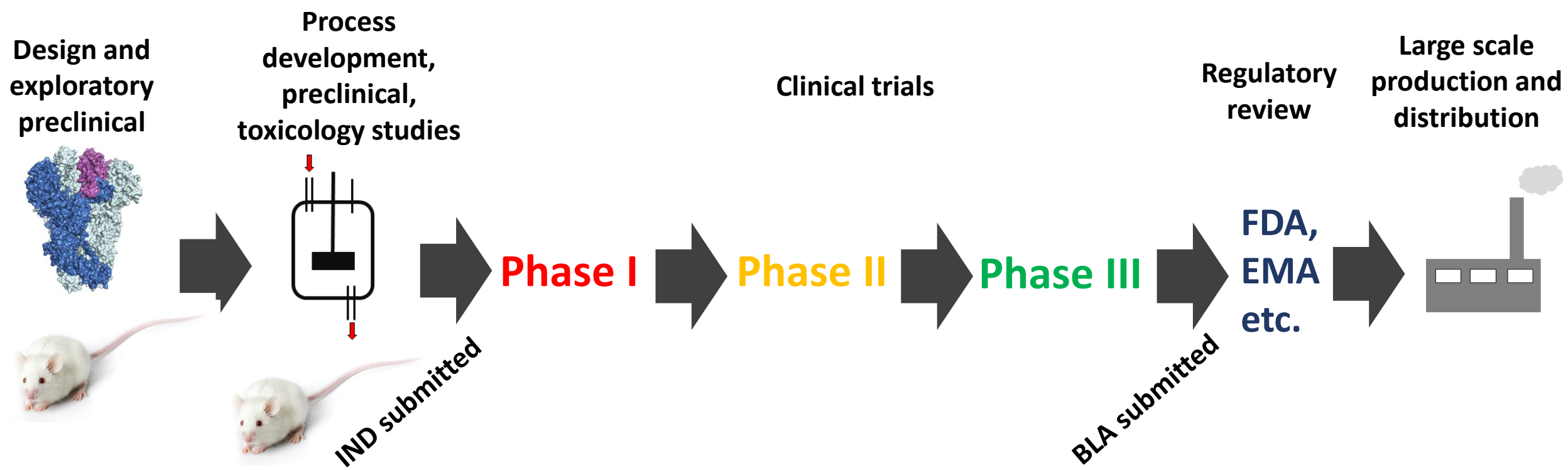
**Icahn School of Medicine at Mount Sinai**

**NVAC Panel on Lessons Learned: COVID-19 Vaccine Development**

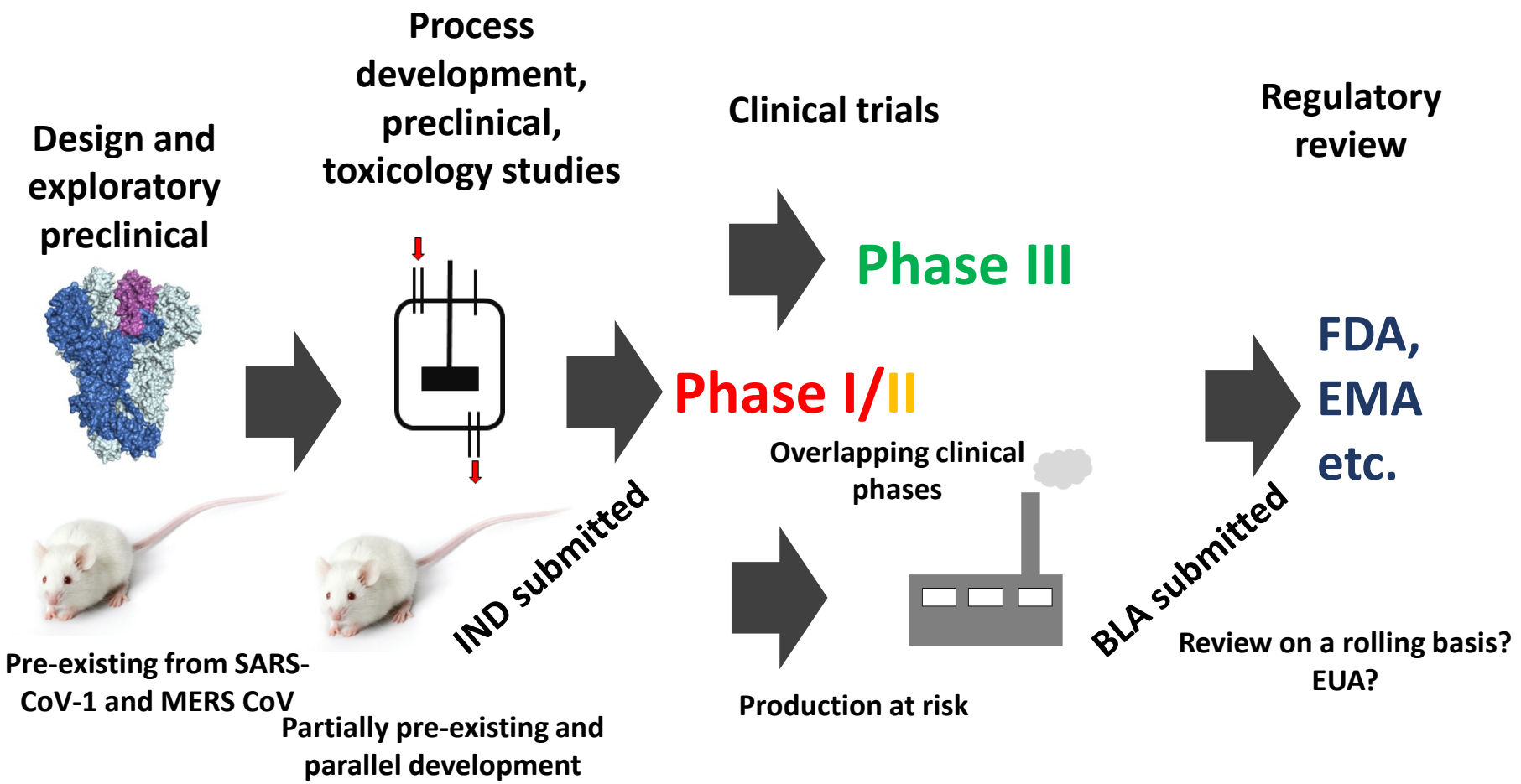
**October 16, 2020**

Mount Sinai

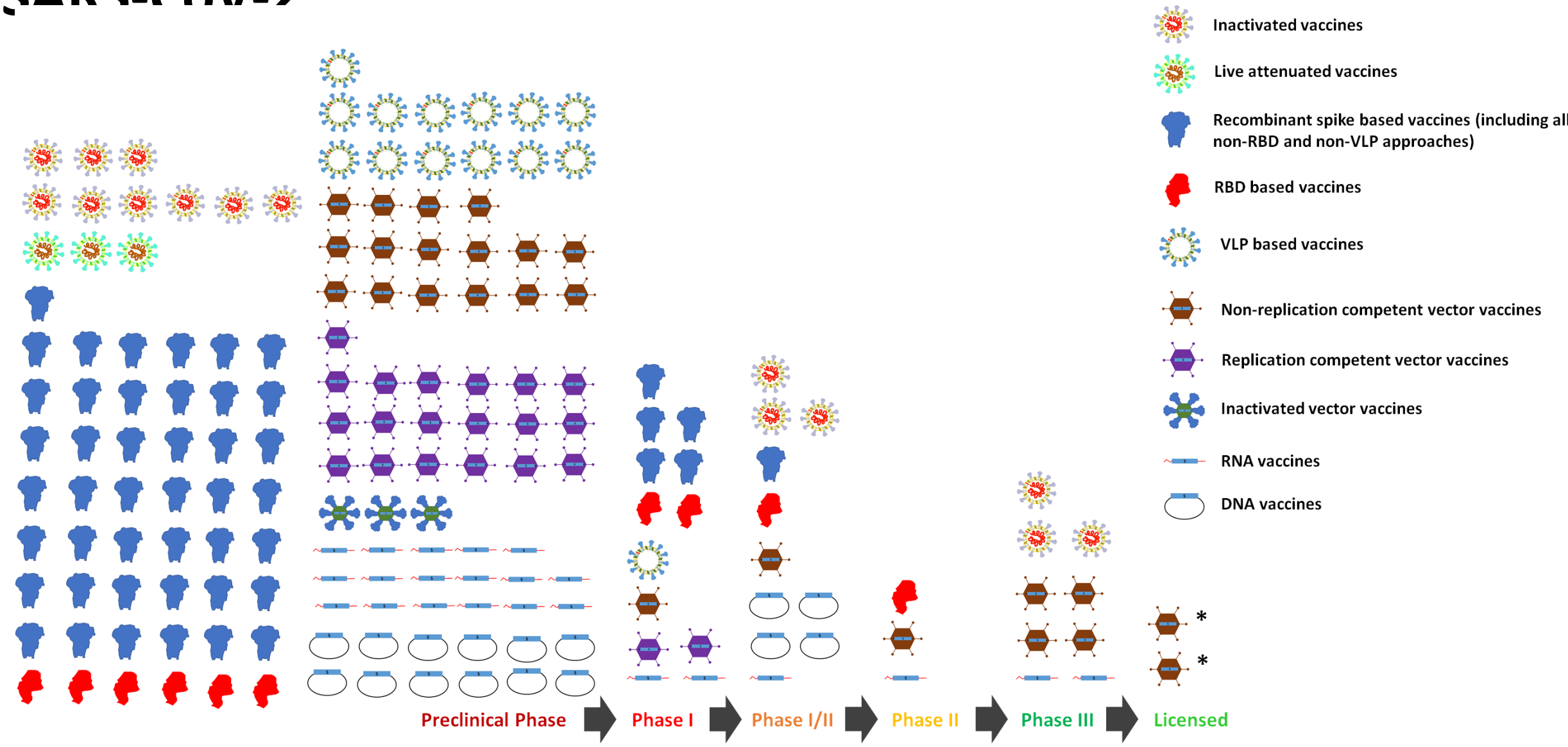
# Vaccine development usually happens at a glacial pace



# COVID-19 vaccine development



# Current vaccine development pipeline for SARS-CoV-2



# What can be learned for ‘normal’ vaccines

- A large number of new vaccine platforms (rProtein, vectors, mRNA) are being tested in clinical trials quickly

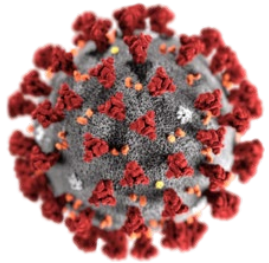
- Different platforms have different characteristics
  - Testing different vaccine platforms in humans for the same target antigen/pathogen will help to select best candidates
  - This is costly, but likely worth it
  - Some platforms might be better suited for some parts of the population than others

- Vaccine development can be sped up significantly by economic de-risking
  - If sufficient funding is available, new vaccines can be tested in a relatively short period of time
  - We will know much quicker if a vaccine will succeed or fail
  - Public-private partnerships may be key for development of many vaccines

# What can be learned for pandemic vaccines?

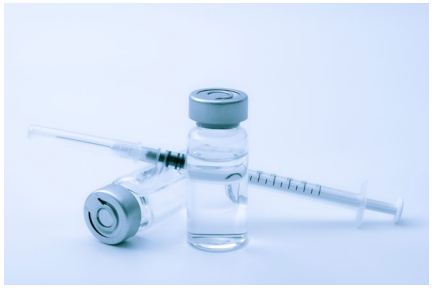
## Current situation

Virus emerges



Global spread, death, suffering,
economic losses, societal disintegration

Vaccines
available?????

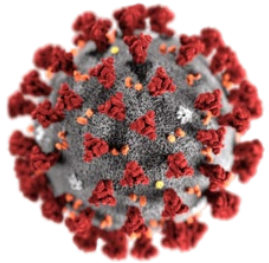


3 months | 6 months | 9 months | 12 months

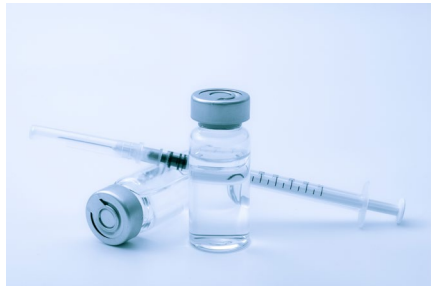
# What can be learned for pandemic vaccines?

## Ideal situation

**Virus emerges**

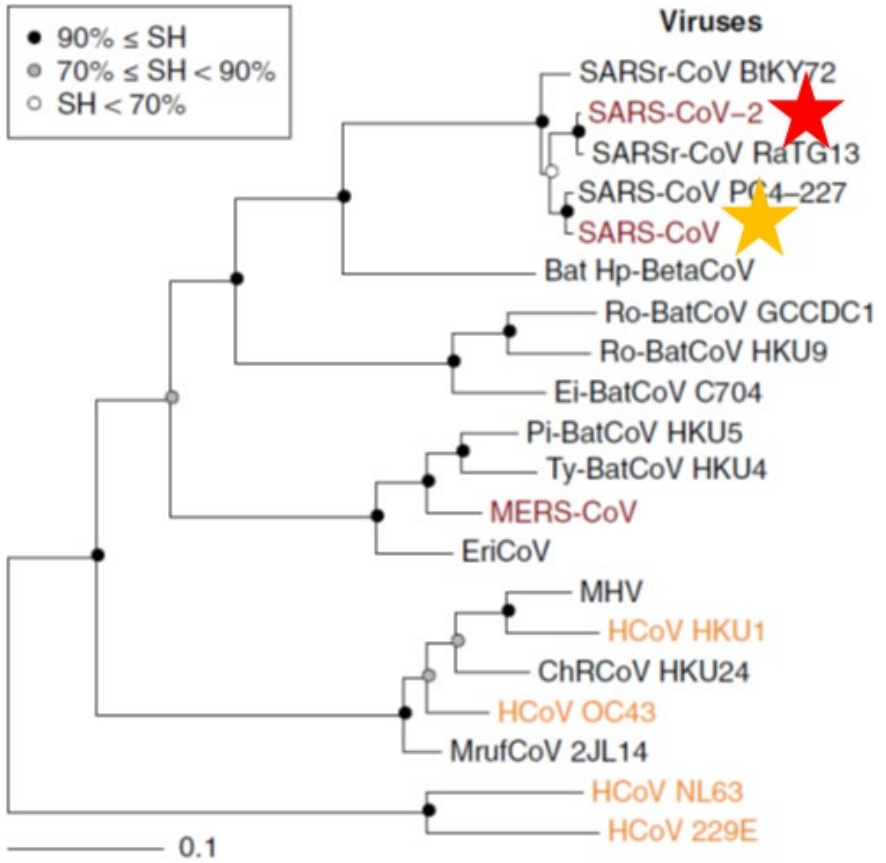


**Vaccines available!**



# How can we get there?

- Select several viruses from ‘dangerous’ virus families
  - Mostly respiratory viruses
  - Paramyxoviruses, coronaviruses, orthomyxoviruses etc.
- Develop vaccines and test in Phase I and Phase II studies
  - Long term follow up of vaccinees to establish safety – if you can’t get numbers, increase time
  - Long term follow up of immune responses
- Establish correlates of protection for related viruses that circulate in humans
  - Knowing the correlate of protection for hCoVs would have helped a lot!
- When a new virus hits, perform a strain change and start Phase III immediately
  - Vaccine could received EUA based on correlate of protection



Public Meeting

# NATIONAL VACCINE ADVISORY COMMITTEE

October 16, 2020

NVAC

**Jason Schwartz, PhD**
Yale University
Yale School of Public Health

NVAC

# Building Confidence in the Immunization System: Legal and Ethical Levers

Efthimios Parasidis, JD, M.Bioethics
Professor of Law and Public Health
Ohio State University

16 October 2020
National Vaccine Advisory Committee
U.S. Dept. of Health and Human Services

# Outline of Presentation

1. Mainstreaming Vaccine Hesitancy
2. Legal Levers to Promote Vaccine Uptake
3. A Role for Public Health Ethics

# Mainstreaming Vaccine Hesitancy

A Growing Trend Before Covid-19

Exacerbated by Hyper-Politicization of Public Health

Mistrust of Government is High and Likely to Endure

# Legal Levers to Promote Vaccine Uptake

Establish Coronavirus Healthcare & Compensation Fund

Recalibrate Liability Shields

Modernize Vaccine Injury Compensation Program

# A Role for Public Health Ethics

Transparency and Public Justification

Distributive Justice and Addressing Disparities

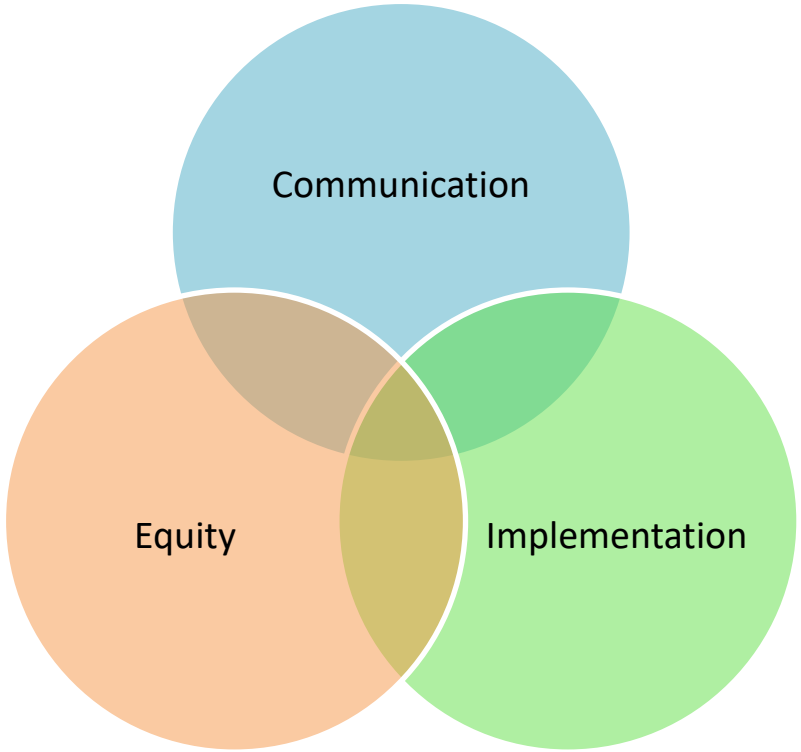
Build and Maintain Trust

Thank you

comments welcome

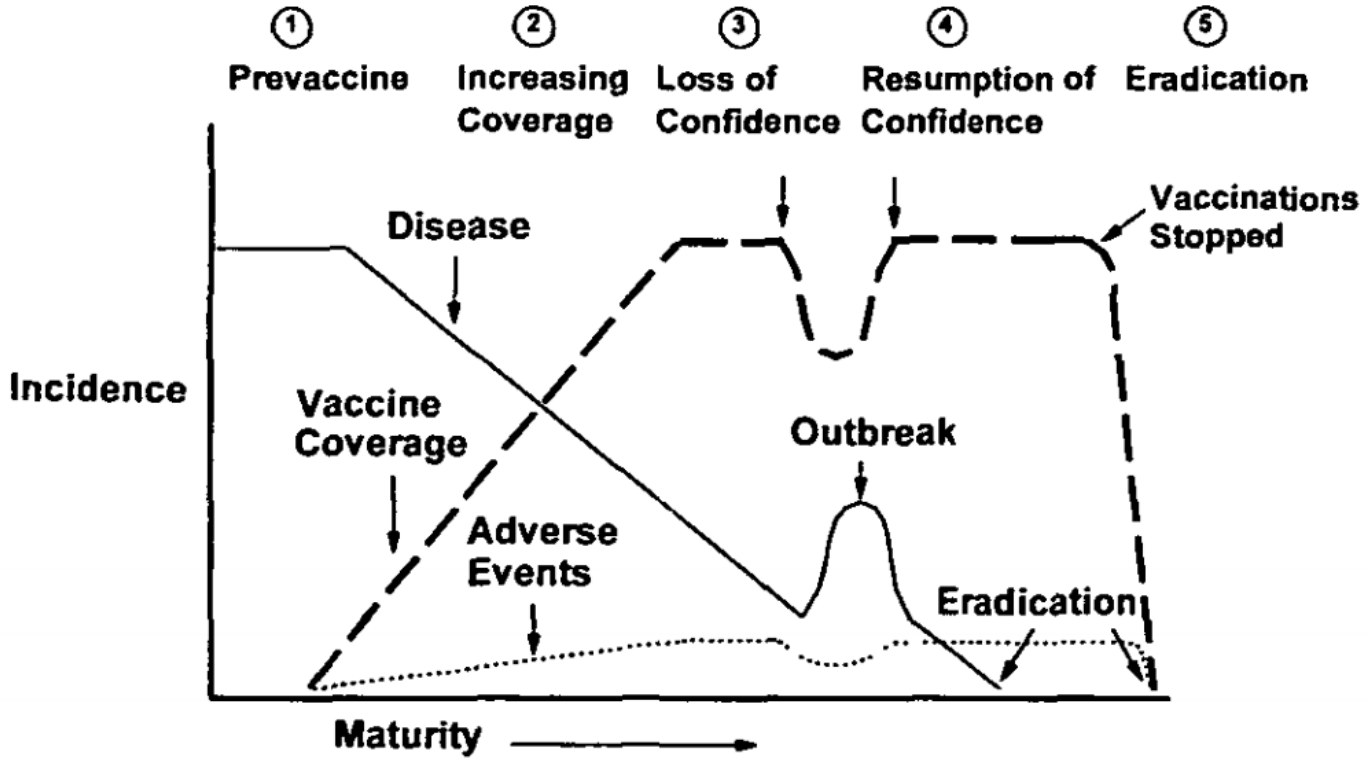
parasidis.1@osu.edu

# Pre-requisites of broad, sustained COVID-19 vaccine confidence & uptake




*Linda Fu, MD, MS*
*George Washington University School of Medicine & Health Sciences*
*Children's National Hospital*
*lfu@childrensnational.org*

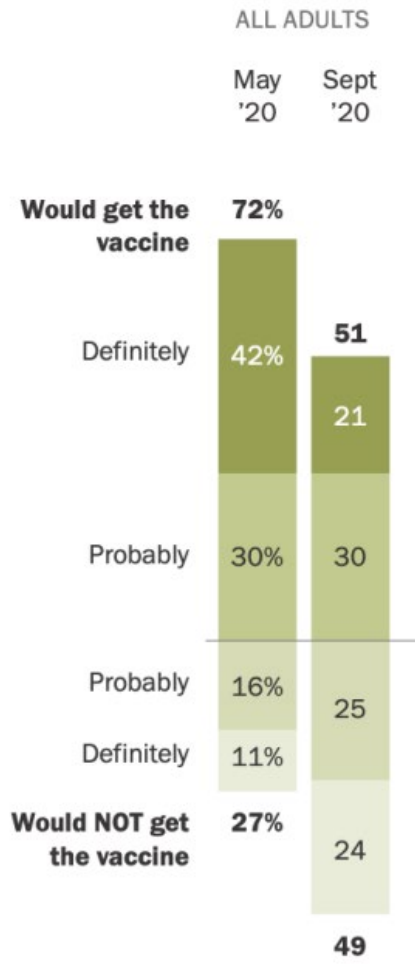
# Vaccination enthusiasm should be highest <u>now</u>

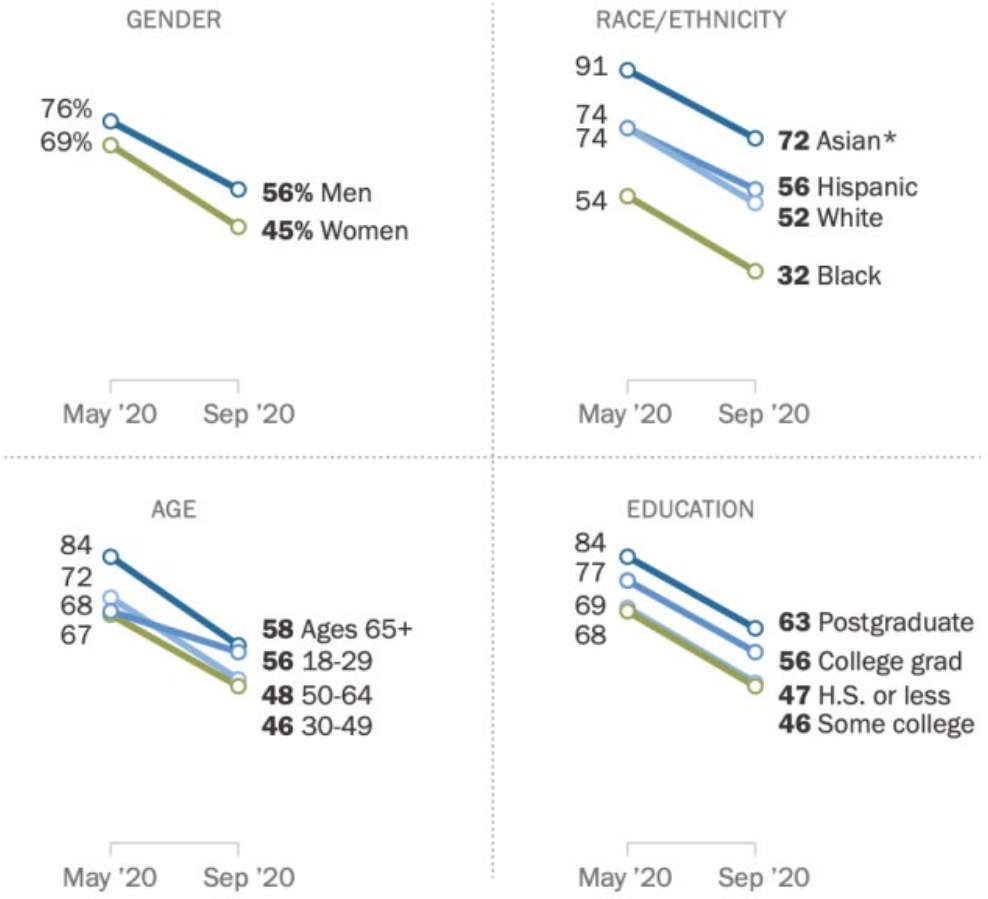



Evolution of immunization programs

Chen & Orenstein. *Epidemiol Rev.* 1996;18(2):99-117

# COVID-19 vaccination intent in the US



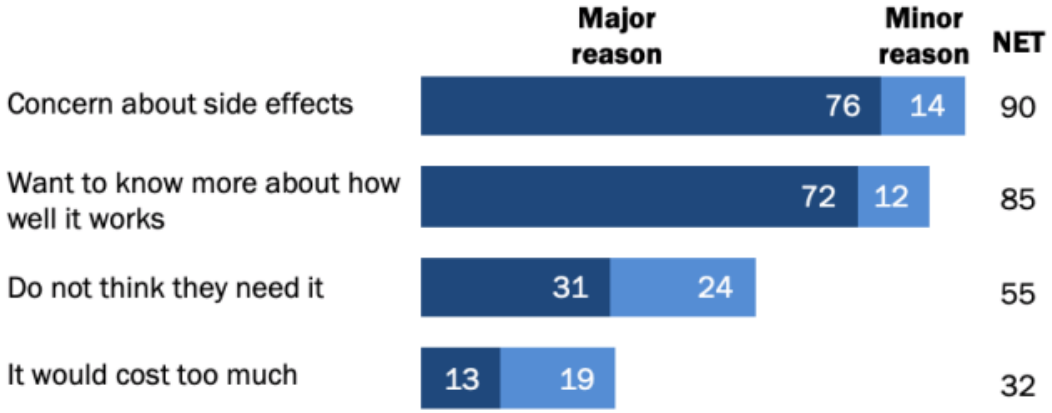

Tyson, Johnson, Funk. Pew Research Center: www.pewresearch.org/science/2020/09/17/u-s-public-now-divided-over-whether-to-get-covid-19-vaccine

# Key components of an effective health communication strategy

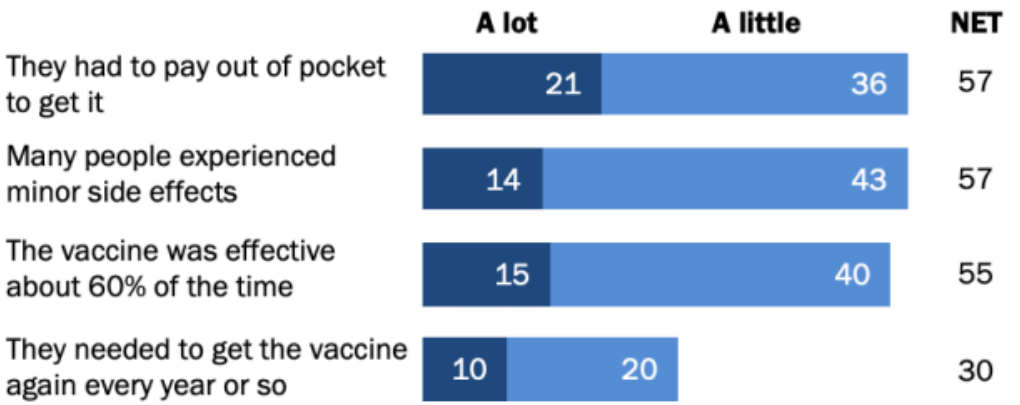
- Transparency
- Individual education
- Social norms

# Transparency

*Concerns among those with low*




*Potential barriers among those with high*

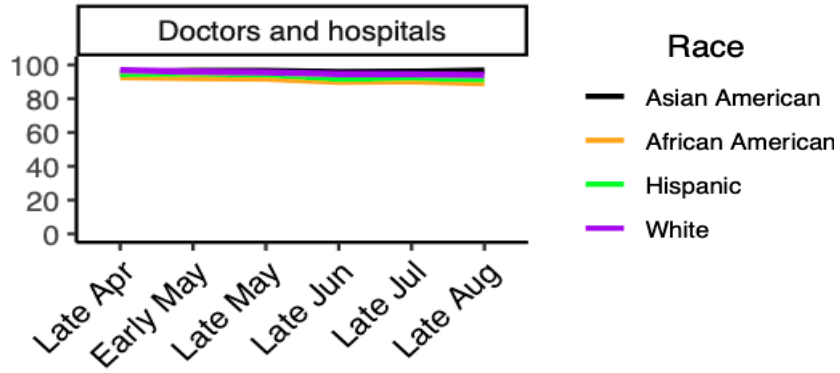



-Tyson, Johnson, Funk. Pew Research Center: www.pewresearch.org/science/2020/09/17/u-s-public-now-divided-over-whether-to-get-covid-19-vaccine

- Define, adhere to and explain safety metrics and protocols
- Facilitate public access to peer-reviewed trial data
- Manage expectations
  - Due to non-immunogenic response, as overall # cases ↓ due to ↑ vaccinations, proportion of vaccinated cases will ↑
  - Emphasize population effectiveness vs. individual efficacy

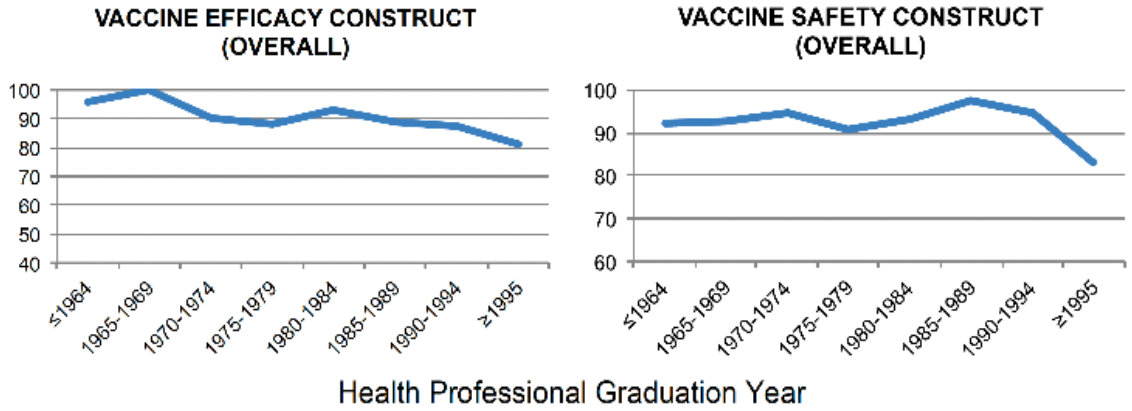
# Patient education

*Trust to handle the COVID-19 ou*




Baum, et al. Report #13: Public Trust in Institutions and Vaccine Acceptance. Sept 2020. www.covidstates.org

*HCP beliefs by graduation year*




Mergler, et al. *Vaccines.* 2013;1(2):154-166

Sources of COVID-19 info among Vietnamese medical providers/students & community workers

- 15%:Training program
- 14%: Internet, online social network
- 7% Unions, associations, clubs

Tran, et al. *Int J Environ Res Public Health*. 2020;17(10):3577

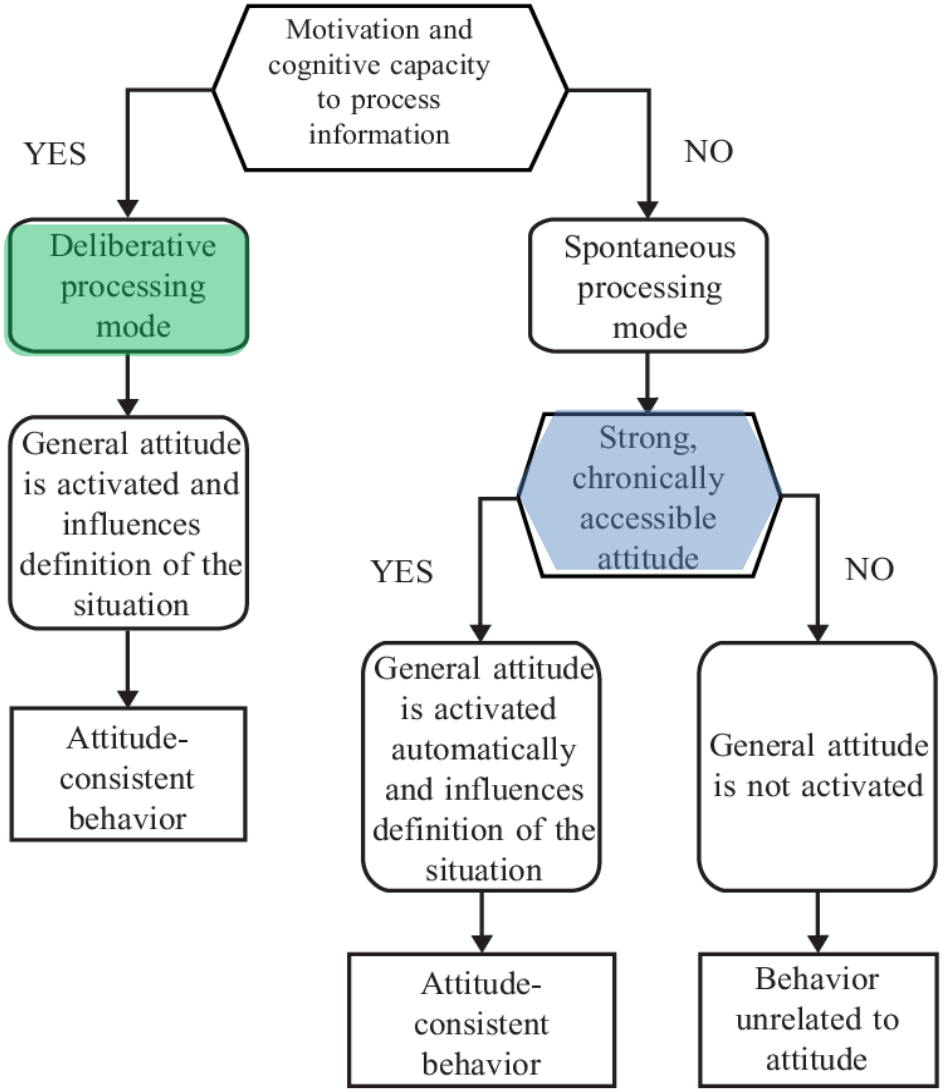
A process is needed to ensure providers, nurses & ancillary staff are all knowledgeable about COVID-19 vaccine development and trained to provide a strong recommendation

# Roles of patient education vs. social norms

***When will general attitudes re. vaccines & healthcare predict COVID-19 vaccination behavior?***

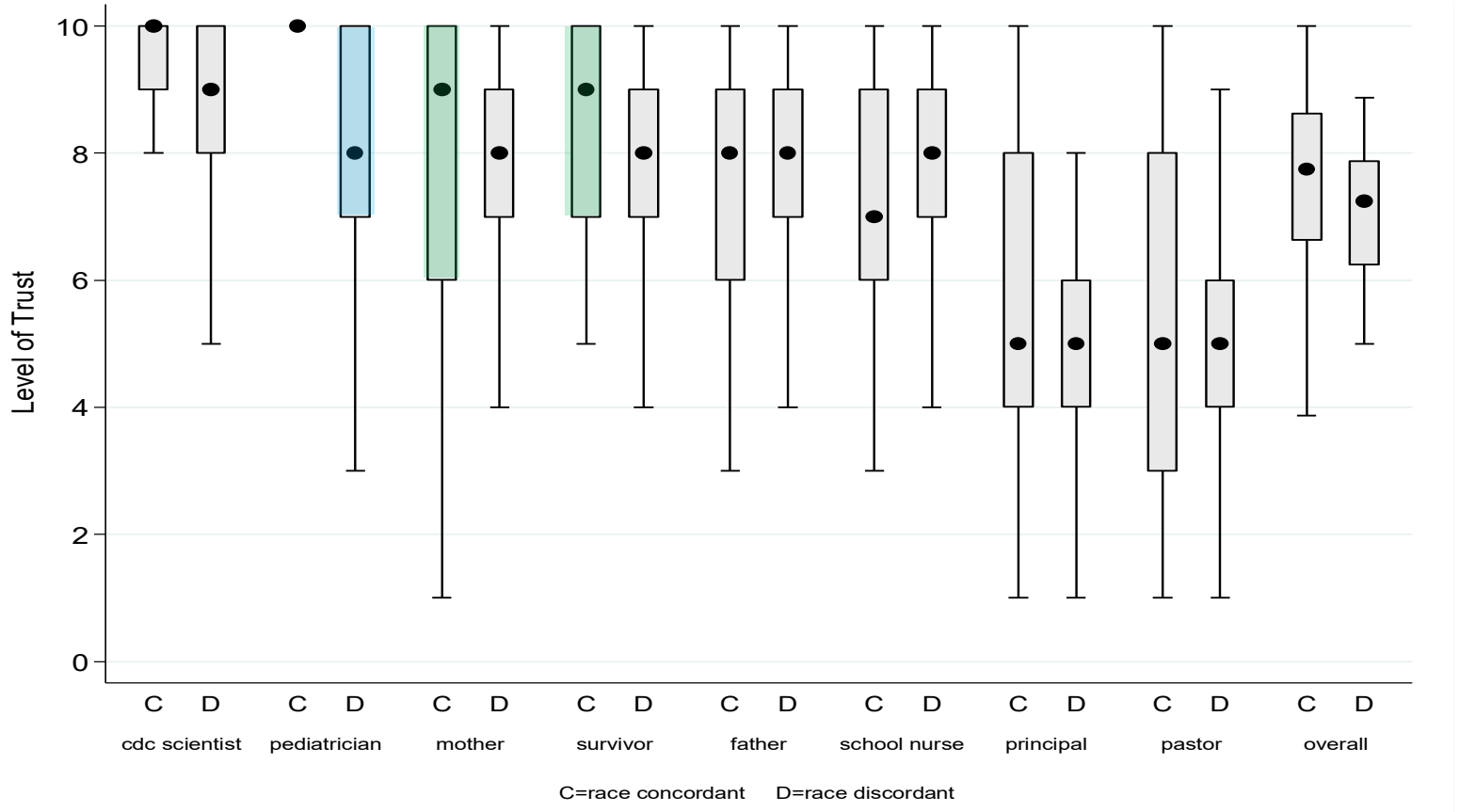
- If motivation & opportunity to deliberate are high → **patient education** can influence general attitudes that result in attitude-consistent behavior

- If motivation & opportunity to deliberate are low AND pre-existing general attitudes are strong → pre-existing attitudes are activated automatically, and no opportunity for education
  - **Social norms** help to establish strong, chronically accessible attitudes




-Fazio & Towles-Schwen. (1999). The MODE model of attitude-behavior processes. In Dual-Process Theories in Social Psychology

# Establishing pro-vaccine social norms among medically underserved & marginalized people of color




Fu, Haimowitz, Thompson. *Hum Vaccin Immunother,* 2019;15(7-8):1715-1722

# Engage cultural leaders & organizations as partners

# Equity


- Inclusion, not targeting: NMA, NHMA, HBCUs, Congressional Black Caucus, UnidosUS
- Expect to expend extra funds for communication and distribution among historically disenfranchised, underserved populations

# Implementation

*"Tuskegee, Tuskegee…Me and mine aren't first in line."*

Anonymous quote re. volunteering for COVID-19 vaccine trial. In St. Fleur. *STAT.* 10/12/20

*"Prove yourself trustworthy before you ask for trust!"*

Braithwaite & Warren. *J Health Care Poor Underserved* 2020:1-12

- Address the fundamental causes of differential community-level risk
- Ensure equitable access to treatment, too
- Support the self-efficacy of individuals to be fully vaccinated
  - Robust IIS tracking systems to record which vaccine brand given & only distribute a single brand to an area. Use reminder/recall for 2$^{nd}$ dose (if indicated)
- Partner with CBOs, faith communities, block associations, parent groups, advocacy groups for broad distribution plan, and to assist with economic and social hardships

*"The caseworker was very welcoming and started saying yes to everything I needed. I felt very supported."*

Anonymous quote re. CBO support services including COVID-19 testing. In Fadulu. *Washington Post.* 9/30/20

# Vaccination mandates

- To maintain, not establish the social norm
- As a cue to action
- As a safety net for medically underserved
- Considerations
  - Timing: education first
  - Fair distribution of burden and benefit

# Improving confidence in COVID-19 vaccines and the Nation's immunization system


## Glen Nowak, PhD.

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Professor, Department of Advertising & Public Relations
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October 16, 2020 –
Presentation to National Vaccine Advisory Committee

Grady College of Journalism and Mass Communication
UNIVERSITY OF GEORGIA

*What should HHS do before, during, and after the COVID-19 vaccination campaign to improve the confidence in these vaccines and our Nation's immunization system, especially within underserved communities, including racial and ethnic minorities?*

# 1. Support and undertake. . .

- Establishment of a unified, proactive, highly visible communication structure to regularly inform the American public about COVID-19 vaccine development, safety processes, approval, and recommendation criteria.

- Communication, education, and information that fosters appropriate expectations among the general public, healthcare providers, policymakers, and the media regarding the safety, effectiveness, and availability of COVID-19 vaccines and vaccination.

- Proactive, extensive, and ongoing community engagement and dialogue, particularly with racial and ethnic minorities and underserved communities.

# 2. Utilize health/immunization communication best practices and social/behavioral science insights

- Successful campaigns and education efforts provide information that speaks to the specific interests, concerns, and questions of 1) those reluctant or less confident about the recommended vaccine, 2) racial and ethnic minorities, and 3) those in underserved communities
- Communication and education messages and materials are most effective when guided by how people make preventative health decisions
  - Personal and indirect experiences (e.g., with a disease/illness, preventive measure)
  - Social, behavioral, and cultural factors that foster or impede acceptance
  - Influential/trusted health information and advice sources and resources
- Healthcare providers are essential – their knowledge, understanding, and confidence in COVID-19 vaccines and vaccination recommendations needs to be strong.

## 3. Recognize that achieving high COVID-19 vaccination will be more challenging than currently imagined

The many uncertainties regarding initial COVID-19 vaccines – especially safety, effectiveness, duration of protection, and availability (including possibility by EUA)

+

Trust, credibility and health information-seeking strongly connected with moral values and political beliefs

+

Wide variations in COVID-19 disease effects/impact and individual perceptions and beliefs regarding the COVID-19 health threat

+

Two-dose vaccines and tiered provision of COVID-19 vaccines when initially available

+

Likelihood of multiple non-interchangeable vaccines being available, each having different requirements and safety and efficacy profiles

=

**A more complex and dynamic vaccine and vaccination communication and education environment that we have previously experienced**

# Thank you!

Public Meeting

# NATIONAL VACCINE ADVISORY COMMITTEE

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# COVID-19 Vaccination Charge Questions

**To Support Communications to Enhance Informed Vaccine Decision Making:**
What should HHS do before, during, and after the COVID-19 vaccination campaign to improve the confidence in these vaccines and our Nation's immunization system especially within underserved communities, including racial and ethnic minorities?

**To Enhance Vaccination of Diverse Populations:**
The FDA standards for approval and licensure of vaccines for COVID-19 addresses safety and effectiveness and encourages inclusion of minorities, the elderly, pregnant women, and people with medical comorbidities in clinical trials. In particular, for the COVID 19 vaccine, I am interested in the approach the nation should take in regard to vaccination of children, given that there will be relatively little data on children from some of the early clinical trials? As context, the case fatality rate for Children under age 18 is .02%. What is the appropriate approach, and timing, of generating the needed data and proceeding to potential childhood vaccination as we move forward?

**To Develop New and Improved Vaccines:**
What lessons can we learn from COVID-19 vaccine development more broadly to promote innovation and shorten timelines to increase availability of new vaccines to the American public?

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