DEVELOPING A VACCINE AND VACCINE STRATEGY FOR COVID-19

UPDATES FROM THE FRONT LINES:
ARIZONA & NEW MEXICO

JULY 8, 2020
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<td>American Academy of Clinical Toxicology (AACT)</td>
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ON-DEMAND RESOURCES

All webinars are recorded and posted to the ACMT website

www.acmt.net/covid19web

Questions?
Write to: info@acmt.net
Q&A will be at end of the Webinar

Please type your questions into the Q&A or Chat function during the webinar and we will get to as many as we can.

We monitor all platforms, including YouTube and Facebook, for questions.
MODERATORS

Paul M. Wax, MD FACMT
- Executive Director, American College of Medical Toxicology (ACMT)

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- President-Elect, American Association of Poison Control Centers (AAPCC)
DEVELOPING A VACCINE AND VACCINE STRATEGY FOR COVID-19

MEDICAL AND PUBLIC HEALTH CONSIDERATIONS OF COVID-19

Evan Anderson, MD
Associate Professor, Pediatrics and Medicine, Emory University School of Medicine, Atlanta, GA
POTENTIAL CONFLICTS AND DISCLOSURES

• Financial compensation to Emory for clinical research:
  • Pfizer, Merck, GSK, Sanofi Pasteur, Novavax, Regeneron, PaxVax, MedImmune, and Micron.

• I have served as consultant:
  • Abbvie, Sanofi Pasteur + Pfizer

• CDC/NIH funded – mRNA-1273 Emory PI
A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster


Summary

Background An ongoing Hubei province, China. data on person-to-per...
A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster

Rapid generation of neutralizing antibody responses in COVID-19 patients

Mehul S. Suthar1,2,3, Matthew G. Zimmerman1,2,3, Robert C. Kauffman1,2,4, Grace Mantus1,2
Susanne L. Lindenman1,2, Abigail Vandemeiden1,2,3, Lindsay Nynot1,2,4, Carl Davis2,4, Seyi Adekunle1,2,4, Maurizio Affer1,2,4, Melanie Sherman2, Rachel Reynolds2, Hans P. Verkerke2
David N. Alfer5, Jeannette Guarnieri5, Janetta Bryksin6, Michael Horwath6, Connie M. Arthur6, Natalia Saakadze6, Geoffrey Hughes Smith6, Sriath Edupuganti6,8, Enn M. Scherer7,8, Kletter7
Hellmeister7,8, Andrew Cheng7,8, Juliet A. Morales7,8, Andrew S. Neish8, Sean R. Stowell8, Filipp P. Frank8, Eric Ortlund8, Evan Anderson9, Vineet D. Menachery10, Nadine Rouphael11, Aneesh Mehta9, David S. Stephens9, Rafi Ahmed11, John D. Roback11, Jens Wrammert1,2,4

**Figure 1.**

- **A.** Receptor binding domain
- **B.** Spike protein RBD

**SARS-CoV-2** spike protein

<table>
<thead>
<tr>
<th>Prototypes</th>
<th>SARS-CoV-2</th>
<th>SARS-CoV</th>
<th>MERS-CoV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta-coronavirus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCoV-HKU1</td>
<td>100</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>HCoV-OC43</td>
<td>100</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>HCoV-NL63</td>
<td>100</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>HCoV-229E</td>
<td>100</td>
<td>66</td>
<td>0</td>
</tr>
</tbody>
</table>

% identity (protein)
We should not have been surprised about a pandemic

Closely related to SARS (Lineage B, betacoronavirus) RNA virus

Binds to the ACE2 receptor

S2 similar (also to other hCoV), but S1 has less homology, particularly through the receptor binding domain (RBD).

Other proteins also exist (e.g., E, M)
SARS-CoV-2 Vaccines: Status Report

Fatima Amanat1,2 and Florian Krammer2,*

1Graduate School of Biomedical Sciences, Icahn School of Medicine at Mount Sinai, New York, NY, USA
2Department of Microbiology, Icahn School of Medicine at Mount Sinai, New York, NY, USA

Correspondence: florian.krammer@mssm.edu

https://doi.org/10.1016/j.immuni.2020.03.007

Current stage: Development of vaccine candidates and pre-clinical testing

RNA vaccines
DNA vaccines
Recombinant protein vaccines
Vecteded vaccines
Inactivated vaccines
Live attenuated vaccines
GMP process development
Clinical trials
FDA, EMA etc.
Large scale production and distribution
Administration
Immunity

Subunit, polysacc, conjug:
HIB, Hep B, HPV, PCV13

VSV-backbone Ebola

Hep A, Flu, IPV

LAIV, Rotavirus, MMRV
mRNA Vaccine Approach
Closely mimics a native viral infection leading to B and T cell responses
### Clinical Trial Phases

<table>
<thead>
<tr>
<th>Phase</th>
<th>Participants</th>
<th>Purpose</th>
<th>Special Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Small number (20–80) of participants, usually healthy volunteers, in some cases patients with advanced disease (e.g., cancer)</td>
<td>To evaluate safety, identify side effects, determine a safe dose range, and learn how the agent is absorbed and handled by the body (pharmacokinetics/dynamics).</td>
<td>Often first time tested in humans</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Larger number (hundreds) of patients with the condition under study</td>
<td>To further evaluate safety and to determine if the agent has the intended effect in humans.</td>
<td>Sometimes randomized controlled trials</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Larger still (thousands) of people with the condition under study</td>
<td>To confirm or further evaluate an agent's effectiveness, monitor side effects, compare it to commonly used treatments, and collect other information that will be used to determine whether the agent should be approved and marketed.</td>
<td>Usually randomized controlled trials</td>
</tr>
<tr>
<td>Phase 4</td>
<td>Various populations</td>
<td>To collect additional information after an agent is approved and marketed regarding its risks, benefits, and use in various populations over a longer period of time.</td>
<td>Effectiveness, identification of very rare side effects, population-based impact</td>
</tr>
</tbody>
</table>

- 70%; Safety, Immunogenicity, Dosing range
- 33%, Safety, Immunogenicity, final dose, final schedule
- 25-30%, safety 1000s, efficacy (5% overall make it to licensure)
<table>
<thead>
<tr>
<th>Platform Type of candidate vaccine</th>
<th>Developer</th>
<th>Coronavirus target</th>
<th>Current stage of clinical evaluation/regulatory status of Coronavirus candidate</th>
<th>Same platform for non-Coronavirus candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Replicating Viral Vector</td>
<td>ChAdOx1-S</td>
<td>University of Oxford/AstraZeneca</td>
<td>SARS-CoV2</td>
<td>Phase 2b/3 2023-00122-127 2023-00122-128 Phase 1/2 2020-001071-15</td>
</tr>
<tr>
<td>Non-Replicating Viral Vector</td>
<td>Adenovirus Type 5 Vector</td>
<td>CanSino Biological Inc./Beijing Institute of Biotechnology</td>
<td>SARS-CoV2</td>
<td>Phase 2 C1CTB20000134783 Phase 1 C1CTB20000160906</td>
</tr>
<tr>
<td>RNA</td>
<td>LNP-encapsulated mRNA</td>
<td>Moderna/NIAID</td>
<td>SARS-CoV2</td>
<td>Phase 2 NCT04500790 Phase 1 NCT04533461</td>
</tr>
<tr>
<td>Inactivated</td>
<td>Inactivated</td>
<td>Wunan Institute of Biological Products/Sinopharm</td>
<td>SARS-CoV2</td>
<td>Phase 1/2 C1CTB20000131809</td>
</tr>
<tr>
<td>Inactivated</td>
<td>Inactivated</td>
<td>Beijing Institute of Biological Products/Sinopharm</td>
<td>SARS-CoV2</td>
<td>Phase 1/2 C1CTB2000012453</td>
</tr>
<tr>
<td>Inactivated</td>
<td>Inactivated + alum</td>
<td>Sinovac</td>
<td>SARS-CoV2</td>
<td>Phase 1/2 NCT04509274 NCT04532609</td>
</tr>
<tr>
<td>Protein Subunit</td>
<td>Full length recombinant SARS-CoV2 glycoprotein nanoparticle vaccine adjuvanted with Matrix M</td>
<td>Novavax</td>
<td>SARS-CoV2</td>
<td>Phase 2 NCT045809280</td>
</tr>
<tr>
<td>RNA</td>
<td>3 LNP-mRNAs</td>
<td>BioNTech/Fosun Pharma/Pfizer</td>
<td>SARS-CoV2</td>
<td>Phase 1/2 2023-001091-36 NCT0458728</td>
</tr>
<tr>
<td>Inactivated</td>
<td>Inactivated</td>
<td>Institute of Medical Biology, Chinese Academy of Medical Sciences</td>
<td>SARS-CoV2</td>
<td>Phase 1 NCT04412531</td>
</tr>
<tr>
<td>DNA</td>
<td>DNA plasmid vaccine with electroporation</td>
<td>Inovio Pharmaceuticals</td>
<td>SARS-CoV2</td>
<td>Phase 1 NCT04358410</td>
</tr>
</tbody>
</table>
Background preclinical work is critical to advancing vaccines

3 stages of clinical vaccine development \((4^{th} \text{ after licensure})\)

Speed: Out with the ‘Old’, in with the ‘New’!” \((maybe)\)

Most vaccines that start in Phase I don’t make it to Phase III

S protein focus (in general)

>100 vaccines in preclinical, about 10 in clinical trials using variety of approaches \((good \ news)\)!
Kinetics of Antibody Responses

https://raphaels7.wordpress.com/tag/allergy/
Seroepidemiological Responses to an Avian Influenza A/H7N9 Vaccine Mixed at the Point-of-Use With MF59 Adjuvant
A Randomized Clinical Trial

Mark J. Mulligan, MD; David L. Bernstein, MD, MA; Patricia Winokur, MD; Richard Rupp, MD; Evan Anderson, MD; Nadine Rouphael, MD; Michelle Dickey, MS, CRNP; Jack T. Stapleton, MD; Srilatha Edupuganti, MD; Paul Spearman, MD; Dilek Ince, MD; Diana L. Noah, PhD; Heather Hill, MS; Abbie R. Bellamy, PhD; for the DMID 13-0032 H7N9 Vaccine Study Group

Figure 4. Association of Antibody Response With Age

Ages 18-34 y (n = 364)

Ages 35-49 y (n = 206)

Ages 50-64 y (n = 130)
Issues in moving into clinical trials

• Safety ≠ Reactogenicity
  • General philosophical approach has been to minimize reactogenicity...
    • A very reactogenic vaccine raises concern about unintended safety consequences (e.g., autoimmune disease)
    • ‘Flu’ from the flu vaccine (innate responses)
    • A safe vaccine can have substantial reactogenicity (e.g., local, systemic symptoms)
  • Maybe a reactogenic vaccine is better...
    • Whole cell pertussis versus acellular, new shingles vaccine
    • Patient’s perceived benefit impacts willingness to receive vaccination
Immune Response to a Vaccine

• Deleterious response
  • “Swine flu” vaccine and GBS
  • Dengue: ADE
  • RSV: VAERD – antibody + T cell

• No immune response

• Advantageous response
  • Ultimately needed
Important Concepts in Vaccine Development

• Speed of development while ensuring safety
  • Safety is primary goal for vaccines, vaccines are given to otherwise healthy people
  • Phase I
    • Once you administer a vaccine, you can’t take it back...
    • Sentinel subjects and pauses in enrollment, small numbers, and dose escalation

• Boost typically needed for many vaccines
  • Goal to administer the boost before exposure
  • In an epidemic one would like to expedite the boost dose
MVA Derivative – IMVAMUNE (Smallpox vaccine)

Conclusions
Single dose < 0+7 < 0+28

Implications

• Antibody responses are better after boost than after the prime

• More vaccine does not necessarily result in higher antibody titers
  • Smallpox, Anthrax, HPV

• Goal is also having an immune response prior to exposure
  • Pandemic = rushing the boost (*may be counter-productive*)
Prime and boost is anticipated to be needed for most vaccine candidates (immune response after single dose is suboptimal)

Safety ≠ Reactogenicity

Maybe we should aim for more reactogenic vaccines (balanced with perception of disease)

Immune response – deleterious, none, advantageous

Patience with Phase I studies

Pandemic = ‘warp speed’, but aging the immune response is similar to wine and cheese (aging = better)
Emory VTEU Vaccine Efforts

DMID 20-0003 – Phase I, Open-Label, Dose-Ranging Study of the Safety and Immunogenicity of 2019-nCoV Vaccine (mRNA-1273) in Healthy Adults

- Kaiser in Seattle is the lead site – initial plan of 45 adults
- Asked to provide backup for Seattle by DMID on March 12
  - Biosafety approval the same day
  - sIRB approved and site activated March 21
  - Screening March 23
  - First dose March 27
  - Major publicity for Emory + CHOA
- Need for (*warp*) speed
- Enrolled into additional cohorts (13 total now!)
  - 56 – 70 year olds, 50 mcg (we have enrolled 43 to date)

### Table 1. Study Groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Years of Age</th>
<th>Number of participants</th>
<th>Vaccine dose of mRNA-1273 for first and second study vaccinations</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>18-55</td>
<td>15</td>
<td>25 mcg</td>
</tr>
<tr>
<td>2</td>
<td>18-55</td>
<td>15</td>
<td>100 mcg</td>
</tr>
<tr>
<td>3</td>
<td>18-55</td>
<td>15</td>
<td>250 mcg</td>
</tr>
</tbody>
</table>
Lot of criticism about the press release:

- **Second dose was less well tolerated than the first (esp. 250 mcg dose)**
- Responses were equal to or greater than convalescent sera (All EIA and 8 neuts)
- Changed the vaccine dose for Phase 2/3
- Phase II started: June 1 (50 vs 100 mcg dose)
- Phase 3 Study in July: Enroll 250+ high risk adults at our site over 4 – 8 weeks
Phase 1/2 Study to Describe the Safety and Immunogenicity of a COVID-19 RNA Vaccine Candidate (BNT162b2) in Adults 18 to 55 Years of Age: Interim Report

Mark J. Mulikamp,1,2 Kirsten E. Lyle,3 Nicholas Kitchin,1,4 Judith Abood,1,5,6 Alejandra Gutierrez,1,7 Stephen Lockhart,1 Kathy DeNell,1 Vanessa Raine,1 Ruth Bailey,1,8 Kenza A. Swanson,1 Ping Li,1,9 Kenneth Kuoy,1,10 Warren Kohli,1,11 David Cooper,11 Camila Fontes-Garza,12 Pei-Yong Shi,13,14 Ozlem Tureci,1 Kristin R. Todd,13,14 Eduard E. Wallis,13,14 Robert Frenck,13,14 Ann R. Falker,13,14 Philip R. Dormitzer,13,14 William C. Gruber,13,14 Ugur Sahin,13,14 and Kathrin U. Janzen13,14

Figure 1a. Serologic events and medications used reported within 30 days after vaccination 1. All dose levels and b. after vaccination 2, 10 µg and 30 µg dose levels. Selected serologic events were: fatigue, headache, chills, fever or worsening muscle.
Safety, tolerability, and immunogenicity of a recombinant adenovirus type-5 vectored COVID-19 vaccine: a dose-escalation, open-label, non-randomised, first-in-human trial

Day 14

<table>
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<tr>
<th></th>
<th>Low dose group (n=36)</th>
<th>Middle dose group (n=36)</th>
<th>High dose group (n=36)</th>
<th>p value</th>
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<tr>
<td><strong>ELISA antibodies to the receptor binding domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GMT</td>
<td>7/6 (4-132)</td>
<td>9/7 (5-147)</td>
<td>12/6 (80-218)</td>
<td>0.29</td>
</tr>
<tr>
<td>4-fold increase</td>
<td>15 (64%)</td>
<td>13 (%50)</td>
<td>12 (54%)</td>
<td>0.035</td>
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</table>

Day 28

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<th>Low dose group (n=36)</th>
<th>Middle dose group (n=36)</th>
<th>High dose group (n=36)</th>
<th>p value</th>
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</thead>
<tbody>
<tr>
<td><strong>ELISA antibodies to the receptor binding domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GMT</td>
<td>8/7 (5-115)</td>
<td>8/6 (5-144)</td>
<td>11/7 (85-190)</td>
<td>0.24</td>
</tr>
<tr>
<td>4-fold increase</td>
<td>19 (63%)</td>
<td>11 (37%)</td>
<td>15 (42%)</td>
<td>0.042</td>
</tr>
</tbody>
</table>

Neutralising antibodies to live SARS-CoV-2

<table>
<thead>
<tr>
<th></th>
<th>Low dose group (n=36)</th>
<th>Middle dose group (n=36)</th>
<th>High dose group (n=36)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMT</td>
<td>2 (12%)</td>
<td>1 (6%)</td>
<td>2 (12%)</td>
<td>0.082</td>
</tr>
<tr>
<td>4-fold increase</td>
<td>10 (32%)</td>
<td>11 (32%)</td>
<td>13 (42%)</td>
<td>0.046</td>
</tr>
</tbody>
</table>

Table 3: Specific antibody responses to the receptor binding domain, and neutralising antibodies to live SARS-CoV-2.
Unique Challenges to the Study

- Risk of natural infection
  - Who was infected at baseline? No FDA approved assay at study start
  - Ongoing potential for SARS-CoV-2 infection during the trial
    - Impact upon safety/reactogenicity, immunogenicity of vaccine
  - Risk to participants/staff – close setting for 2 hours
    - No universal mask policy, we had insufficient masks
  - Work/travel restrictions

Key Questions for Vaccines Moving Forward

- Burden of disease at time of Phase III study?
- Vaccine stability at freezer and refrigerator temperatures? Global?
- Ramping up vaccine production, distribution, delivery in the setting of pandemic
- Funding for vaccine – who will pay for the uninsured/underinsured?
- Whom to vaccinate, particularly when have limited vaccine supply?
- Will people choose to get vaccinated?
Do we need a pediatric vaccine?

- Children can become seriously ill with COVID-19
  - Infection, MIS-C
- Children have prolonged and high-titer viral shedding
  - Less able to control their secretions + maintain social distancing
- Substantial impact upon teachers, daycare providers, and healthcare providers who have frequent contact with children.
- Reservoir of infection from which reintroduction to adult population could occur
- Important considerations for pediatric vaccination
  - Medical home with infrastructure for providing + distributing vaccine
  - Vaccines for Children funding (VFC)
  - Providers caring for children know how to vaccinate...

Kao C, Orenstein W, Anderson EJ. *Clinical Infectious Diseases* 2020; In press; PMID: 32492123
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 △ 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. Anderson, Daugherty, Pickering, Orenstein, Yogev. CID 2018
Multiple unique challenges with conducting studies in the setting of a pandemic

Role for challenge studies?

Are we prepared to roll out a vaccine?

Who do we vaccinate and prioritize?

Children would have direct benefit of vaccine, may be critical group to vaccinate to protect the ‘herd’
CORONAVIRUS PANDEMIC
THE SEARCH FOR A VACCINE
CDC Urges Americans To Just Say No If Friend Offers Them Coronavirus

Monday 10:35AM • SEE MORE: NEWS
Protecting the Community Through Child Vaccination

Evan J. Anderson,1,2 Michael A. Daugherty,1,2 Larry K. Pickering,1 Walter A. Orenstein,1,2 and Ram Yoge3

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

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.

Table 3. Predicted Mathematical Expansion in the Number of Cases for a Pathogen with a Basic Reproduction Number of 4 and a Crude Immunity Threshold of 75%*
Future Challenges for Phase II/III in the Era of a Pandemic

- Correlate of protection
  - Challenge study with COVID-19 in highly controlled setting
    - Cholera
  - Vaccine protection against infection can be used to establish a correlate of protection
  - Extrapolate correlate of protection to Phase III study in case there is not enough circulation
Conclusions
Better response with Days 0+28 than Days 0 and 14
No difference for 2 vs 3 full doses
All responded to late boost

THANK YOU

PLEASE REACH OUT IF YOU HAVE ANY QUESTIONS

Evan Anderson, MD
Associate Professor, Pediatrics and Medicine, Emory University School of Medicine, Atlanta, GA
evanderson@emory.edu
UPDATES FROM THE FRONT LINES:
ARIZONA & NEW MEXICO
CONFLICT OF INTEREST

THE FOLLOWING SPEAKERS DO NOT HAVE ANY CONFLICTS OF INTEREST TO DISCLOSE
Daniel E. Brooks, MD
- Medical Director, Poison & Drug Information Center and Outpatient Toxicology Clinic
- Banner University Medical Center – Phoenix
- Phoenix, AZ

Steven A. Seifert, MD, FAACT, FACMT
- Medical Director, NM Poison Center
- Professor, UNM School of Medicine
- Albuquerque, NM
ARIZONA: COVID-19 RESPONSE TIMELINE

May 1st – Resume elective surgeries
May 2nd – Az initiates a ‘testing blitz’
May 8th – Re-opening started (limited business with social distancing)
~ May 25 – Large increase in Arizona COVID cases
June 29th – Re-opening ‘paused’ (closing of bars, gyms, movies, tubing X 1m)
July 27th – Re-evaluation of opening businesses every 2 weeks

School closed through August 17th
Arizona Medical Association
7.6.20

90% adult ICU capacity
82% inpatient capacity
51% ventilator capacity

~20% of PCR tests are positive

Feds sending ~ 500 extra staff to Az
<table>
<thead>
<tr>
<th>Category</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cases</td>
<td>105,094</td>
</tr>
<tr>
<td>Number of Deaths</td>
<td>1,927</td>
</tr>
<tr>
<td>Number of COVID-19 Tests</td>
<td>811,870</td>
</tr>
<tr>
<td>Number of New Cases reported</td>
<td>3,653</td>
</tr>
<tr>
<td>Number of New Deaths reported</td>
<td>117</td>
</tr>
<tr>
<td>Number of New Tests reported</td>
<td>11,418</td>
</tr>
<tr>
<td>Rate of cases, per 100,000</td>
<td>1,461.9</td>
</tr>
<tr>
<td>Rate of fatalities, per 100,000</td>
<td>26.80</td>
</tr>
<tr>
<td>Total Percent Positive**</td>
<td>11.3%</td>
</tr>
<tr>
<td>Total COVID-19 PCR Tests</td>
<td>628,275</td>
</tr>
<tr>
<td>New PCR Tests reported today</td>
<td>10,932</td>
</tr>
<tr>
<td>PCR Percent Positive**</td>
<td>13.6%</td>
</tr>
<tr>
<td>Total COVID-19 Serology Tests</td>
<td>183,595</td>
</tr>
<tr>
<td>New Serology Tests reported</td>
<td>486</td>
</tr>
<tr>
<td>Serology Percent Positive**</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

*Counts of new cases, deaths, and numbers tested reflect increases in the total numbers compared to the previous day.

**Percent positive is the number of people with a positive test result, out of all people with COVID-19 testing completed in AZ.

Date Updated: 7/7/2020
ARIZONA: COVID-19 RESPONSE TIMELINE

January 26th – First confirmed Az COVID case
(ASU student returning from Wuhan, China)

March 6th – First documented Az community spread of COVID

March 11th – Governor Ducey declares public health emergency

March 19th – Elective surgeries halted

March 30th – Stay at Home order initiated through April 30th

April 4th – Amended/edited initial order

April 29th – Extended Stay-at-Home order through May 15th
ARIZONA COVID HOTLINE – ARIZONA POISON SYSTEM

844-542-8201

Started: 1/26/20
Statewide: 3/10/20

Highlighted Infectious Diseases for Arizona

Coronavirus Home

Coronavirus Disease 2019 (COVID-19)

- The Arizona Poison Control System is available to answer questions about COVID-19 from Arizona providers (for testing and patient guidance) and the general public (for testing, isolation, and quarantine guidance) at 1-844-542-8201
- The President’s Coronavirus Guidelines for America -- 15 Days to Slow the Spread of Coronavirus (COVID-19) is available at Whitehouse.gov
- Governor Ducey’s Executive Order released March 19, 2020.
ARIZONA UPDATES – COVID HOTLINE NUMBERS

Staffed by both Az PCCs, calls geo-routed to correct PC.

844-542-8201 Automated (integrated Voice Triage) System.

Total calls: 112,803 (14,000 in June)

Poison Center Staff cases: 26,163
(average call time ~ 7 min)

(as of 7/5/20)
Public Fatigue

Healthcare Provider Fatigue

Alert Fatigue?
daniel.brooks@bannerhealth.com

602-839-2983
3 Die in New Mexico After Drinking Hand Sanitizer, Officials Say

A spokesman for the state’s Health Department said the cases were related to alcoholism.

Hand sanitizer is sometimes consumed for its high alcohol content. Seth Wenig/Associated Press
Q&A
ON-DEMAND RESOURCES

All webinars are recorded and posted to the ACMT website

www.acmt.net/covid19web

Questions?
Write to: info@acmt.net
Global Approaches to Lifting COVID-19 Mitigation Strategies and Lessons Learned
Research Update: Remdesivir

Wednesday, July 15, 2020
3:00 PM EDT

www.acmt.net/covid19web