

COVID-19 Vaccine Distribution

John M. Douglas, Jr, MD

Mountain Plains COVID-19 ECHO Program
December 15, 2020



The Beginning of the End



12/14/2020 F.D.A. Clears Pfizer Vaccine, and Millions of Doses Will Be Shipped Right Away - The New York Times

The New York Times <https://nyti.ms/34412Tz>

F.D.A. Clears Pfizer Vaccine, and Millions of Doses Will Be Shipped Right Away

An initial shipment of about 2.9 million doses of the vaccine will be sent around the United States over the next week.

By Katie Thomas, Sharon LaFraniere, Noah Weiland, Abby Goodnough and Maggie Haberman

Dec. 13, 2020

The Food and Drug Administration authorized Pfizer's Covid-19 vaccine for emergency use on Friday, clearing the way for millions of highly vulnerable people to begin receiving the vaccine within days.

The authorization is a historic turning point in a pandemic that has taken more than 290,000 lives in the United States. With the decision, the United States becomes the sixth country — in addition to Britain, Bahrain, Canada, Saudi Arabia and Mexico — to clear the vaccine. Other authorizations, including by the European Union, are expected within weeks.

The F.D.A.'s decision followed an extraordinary sequence of events on Friday morning when the White House chief of staff, Mark Meadows, told the F.D.A. commissioner, Dr. Stephen Hahn, to consider looking for his next job if he didn't get the emergency approval done on Friday, according to a senior administration official who spoke on condition of anonymity because he was not authorized to discuss the matter. Dr. Hahn then ordered vaccine regulators at the agency to do it by the end of the day.

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Early Release / Vol. 69

December 13, 2020

The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine — United States, December 2020

Sara E. Oliver, MD¹; Julia W. Gargano, PhD¹; Mona Marin, MD¹; Megan Wallace, DrPH^{1,2}; Kathryn G. Curran, PhD¹; Mary Chamberland, MD^{1,3}; Nancy McClung, PhD¹; Doug Campos-Outcalt, MD⁴; Rebecca L. Morgan, PhD⁵; Sarah Mbaeyi, MD¹; José R. Romero, MD⁶; H. Keipp Talbot, MD⁷; Grace M. Lee, MD⁸; Beth P. Bell, MD⁹; Kathleen Dooling, MD¹

Challenges of COVID-19 Vaccine Distribution



- Tiered allocation
- Trust
- Delivery logistics

Here are the major hurdles ahead for Covid-19 vaccine distribution in the US

The US must undertake the most logistically difficult vaccination campaign in history, from trust to extreme storage requirements



▲ Vials of a coronavirus vaccine candidate are sorted at a Pfizer facility in Puurs, Belgium. Photograph: Pfizer/Reuters

The Advisory Committee on Immunization Practices' Interim Recommendation for Allocating Initial Supplies of COVID-19 Vaccine — United States, 2020

Weekly / December 11, 2020 / 69(49);1857-1859

On December 3, 2020, this report was posted online as an MMWR Early Release.

Kathleen Dooling, MD¹; Nancy McClung, PhD¹; Mary Chamberland, MD^{1,2}; Mona Marin, MD¹; Megan Wallace, DrPH^{1,3}; Beth P. Bell, MD⁴; Grace M. Lee, MD⁵; H. Keipp Talbot, MD⁶; José R. Romero, MD⁷; Sara E. Oliver, MD¹ ([View author affiliations](#))

Work Group Proposed Interim Phase 1 Sequence

Phase 1c Adults with high -risk medical conditions Adults 65+	
Phase 1b Essential workers (examples: Education Sector, Food & Agriculture, Utilities, Police, Firefighters, Corrections Officers, Transportation)	
Phase 1a Health care personnel LTCF residents	

Time

Proposed groups for Phase 1a vaccination

Health care Personnel ^{1,2} (HCP) (~21million)	Long-Term Care Facility (LTCF) Residents ³ (~3M)
Examples	
<ul style="list-style-type: none"> Hospitals Long-term care facilities Outpatient clinics Home health care Pharmacies Emergency medical services Public health 	<ul style="list-style-type: none"> Skilled nursing facilities (~1.3 M beds) Assisted living facilities (~0.8 M beds) Other residential care (~0.9 M beds)

1. <https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/index.html>
 2. <https://www.cisa.gov/publication/guidance-essential-critical-infrastructure-workforce>
 3. <https://www.cdc.gov/longtermcare/index.html>



COVID-19 VACCINE DISTRIBUTION

PHASE 1

Winter



1A

Highest-risk health care workers and individuals:

- People who have direct contact with COVID-19 patients for 15 minutes or more over a 24-hour period.
- Long-term care facility staff and residents.

1B

Moderate-risk health care workers and responders:

- Health care workers with less direct contact with COVID-19 patients.
- Workers in home health/hospice and dental settings.
- EMS, firefighters, police, correctional workers, dispatchers, funeral services, other first responders, and COVID-19 response personnel.

PHASE 2

Spring



2

Higher-risk individuals and essential workers:

- People age 65 or older.
- People of any age with obesity, diabetes, chronic lung disease, significant heart disease, chronic kidney disease, cancer, or are immunocompromised.
- People who interact directly with the public at work, such as grocery store workers and school staff.
- People who work in high density settings like farms and meat-packing plants.
- Workers serving people that live in high-density settings.
- Other health care workers not covered in Phase 1.
- Adults who received a placebo during a COVID-19 vaccine clinical trial.

PHASE 3

Summer



3

The general public:

- Anyone age 18-64 without high risk conditions.

*Timeline subject to change based on supply chain. Prioritization subject to change based on data, science, availability.



Up and Coming: Conversations Over Allocatoin



OPINION > OPINION COLUMNISTS • Opinion, Opinion Columnist

Mike Johnston: Educators should be front of the line for the COVID vaccine

Teachers should be top priority for the vaccine like health care workers



OPINION > OPINION COLUMNISTS • Opinion, Opinion Columnist

Brauchler: Prioritizing prisoners over the elderly for a COVID vaccine is wrong in every way

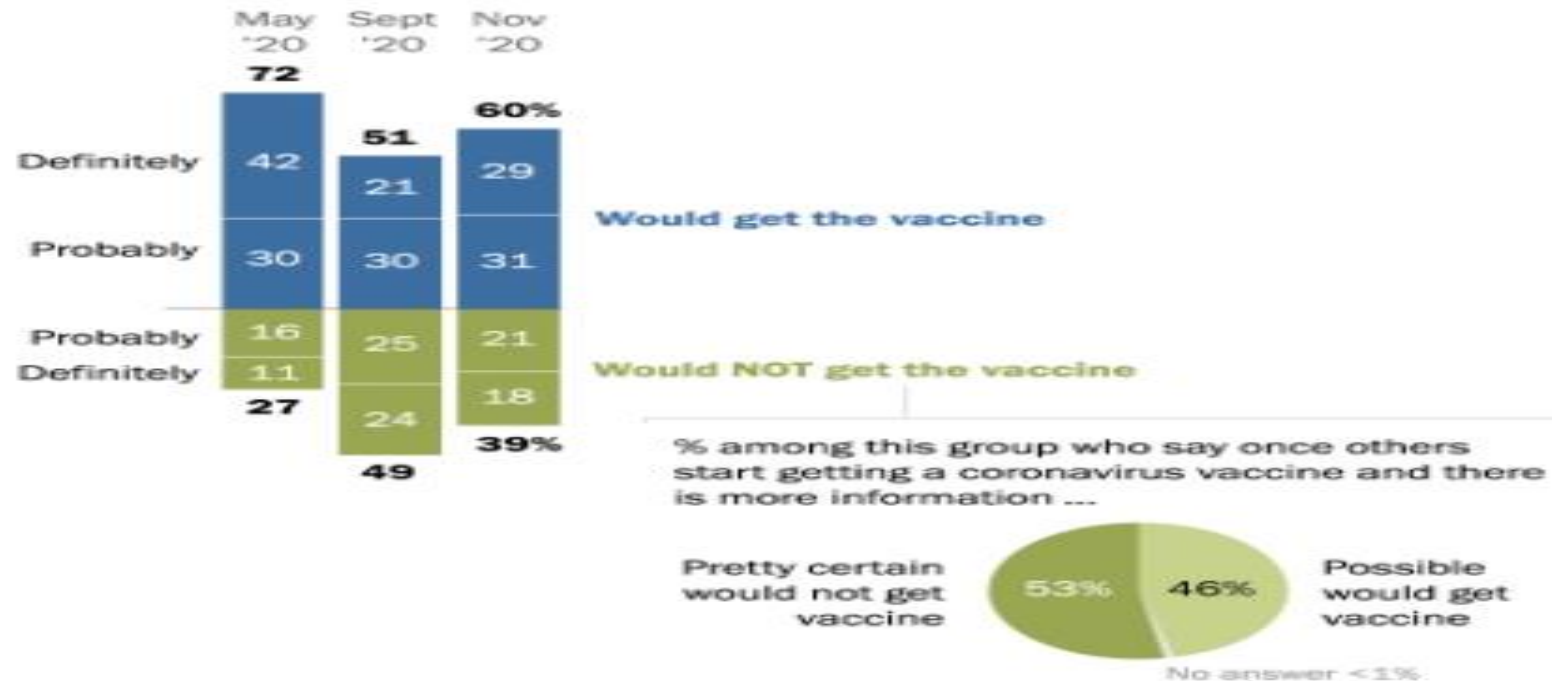


Trust: Trends in National Public Attitudes



Majority of Americans now say they would get a vaccine for the coronavirus

% of U.S. adults who say if a vaccine to prevent COVID-19 were available today, they ...



Note: Respondents who did not give an answer are not shown.

Source: Survey conducted Nov. 18-29, 2020.

"Intent to Get a COVID-19 Vaccine Rises to 60% as Confidence in Research and Development Process Increases"

PEW RESEARCH CENTER

COVID-19 Vaccine Acceptance Variation

Willingness to be vaccinated varies among race, ethnicity and gender.

POPULATION	MEN	WOMEN
General Population	76%	57%
Hispanic	67%	51%
African American	58%	50%

- Overall, **66% of Coloradans would get vaccinated** with an FDA approved vaccine in early 2021, while **34% would not.**
- Among those who would get vaccinated, **48% would as soon as they could**, while **45% would wait and 7% are not sure.**



Phase I: Pfizer Week 1-Distribution

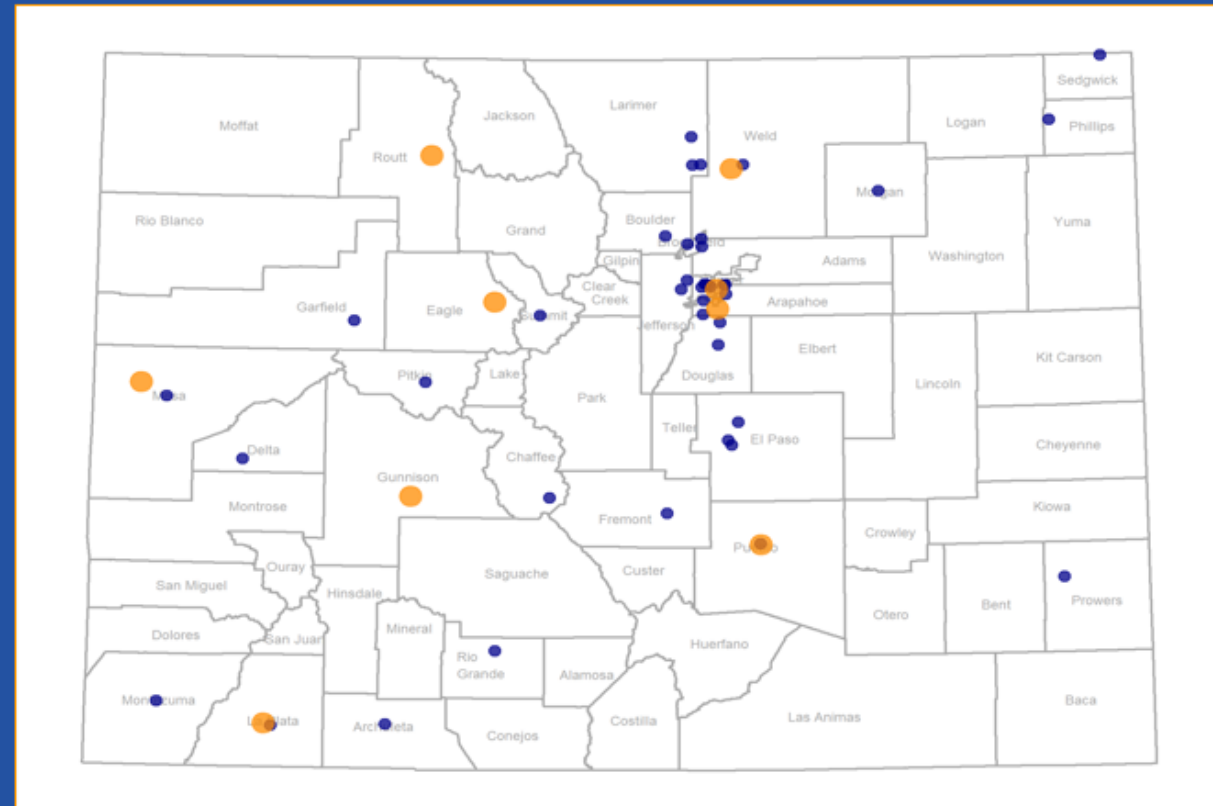
Week of December 14th-1st shipment of Pfizer vaccine: 46,800. They will be distributed to the following locations:

- **Distribution Centers**

Location where Pfizer vaccine will be stored at ultra low temps before going to providers around the state.

- **Providers**

Location that will administer the vaccine.



To view details locations and allocation: covid19.colorado.gov/vaccine-for-coloradans



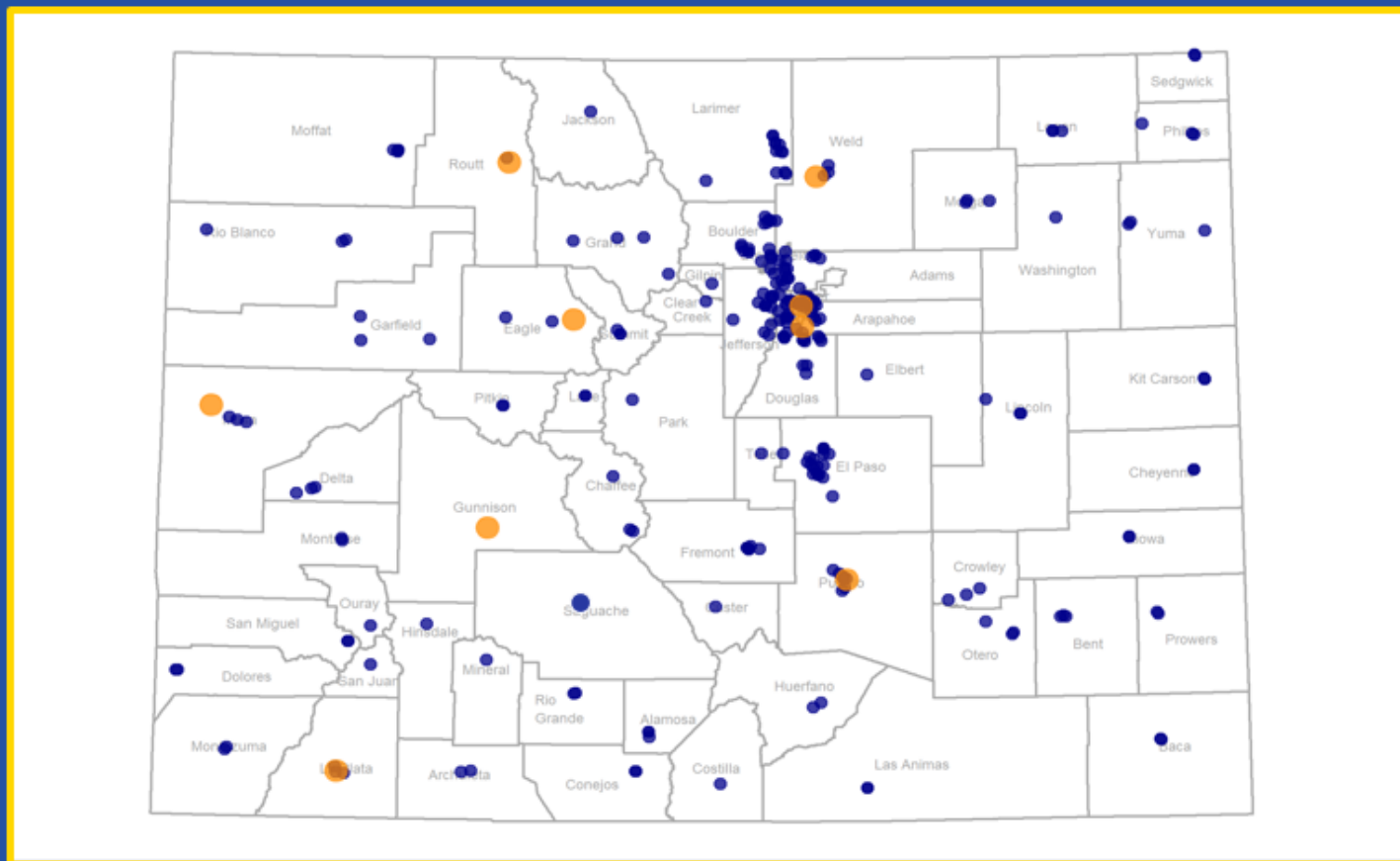
Colorado Phase 1 Provider Map

● Distribution Centers

Location where Pfizer vaccine will be stored at ultra low temps before going to providers around the state.

● Providers

Location that will administer the vaccine.



Vaccine Reporting and Monitoring

- **Colorado will require all COVID-19 vaccination providers** to report administered doses to the Colorado Immunization Information System (CIIS) **within 72 hours of vaccine administration to ensure not one dose goes to waste.**
- **Every Coloradan's immunization records are confidential, personal medical information that will never be shared publicly.** The state will report and collect public health information on the total number of residents who have been vaccinated in Colorado, but this data will not be attached to any individual's personally identifying information.
- The state of Colorado will not share personal information with the federal government.



Distribution Challenges: Logistics



- Cold storage requirements due to instability of lipid nanoparticle encased mRNA
 - Pfizer shipped at -103 degrees F, stored 5 days in refrigerator
 - Will use “thermal shippers” which maintain cold 10 days unopened
 - Reusable and can be used as temporary storage containers by replenishing dry ice q 5 days, for up to 3 re-icings
 - Hold 975 doses, making use in lower population areas harder
 - Moderna: shipped & long-term storage at -4 degrees F, stored 30 days in refrigerator
 - Criteria may change over time
- Multidose vials for faster packaging (5 Pfizer, 10 Moderna) make scheduling to avoid wastage more critical (current vaccines single dose except flu, polio)
- Two doses (21 d Pfizer, 28 d Moderna), non-interchangeable
 - Mandatory use of CIIS
 - Reminder recall
- Enlarging vaccine options over time: who stocks which?

COVID-19 Vaccine: Pending Issues



- Timing EUA, ACIP recommendations, initial release
- Manufacturing capacity
- Which vaccines to use in whom over time
 - Match to target group
 - Value in previously infected
- Untested populations: children, pregnant F
- Vaccine Mandates
- Impact on other preventive measures
- Effective messaging by population and time
- Likely others we haven't thought about

Achieving Herd Immunity*



- Herd immunity calculation
 - $1 - 1/R_0$
 - If R_0 3.0, then 65%
- If population susceptibility not uniform (due to behavior or biology), Herd Immunity Threshold (HIT) could be lower
 - If most susceptible individuals infected/vaccinated first, remaining population is less at risk
- Even if HIT is met, outbreaks can still occur (eg, measles in 2019)
- HI depends on both vaccine efficacy (& duration of immunity) and coverage
 - 65% effective vaccine needs 100% coverage to get to HIT
 - 80% effective vaccine needs 80% coverage to get to HIT
 - 90% effective vaccine needs 70% coverage to get to HIT
- Herd immunity is a continuum
 - Even a partially effective vaccine can provide value/save lives



Questions?