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The Path to Immunity: What Employers Need to Know About COVID-19 Vaccinations

Presented by Chamber Healthcare Council

Thank you for joining. We will begin shortly.

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Jack Lavin
President & CEO
Chicagoland Chamber of Commerce

Cancer Treatment Centers of America®

Comprehensive Care and Research Center
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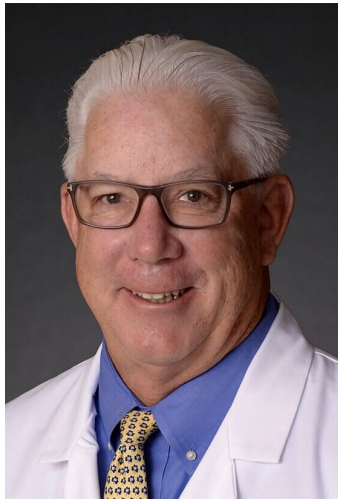

Dr. Julian Schink

Chief Medical Officer

Cancer Treatment Centers of America

Chair, Chamber Healthcare Council

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Professor, Divisions of Infectious Diseases & Organ Transplantation

Northwestern University Feinberg School of Medicine

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The Path to Immunity: *What Employers Need to Know About COVID-19 Vaccinations*

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Chicagoland Chamber of Commerce – *Path to Immunity*

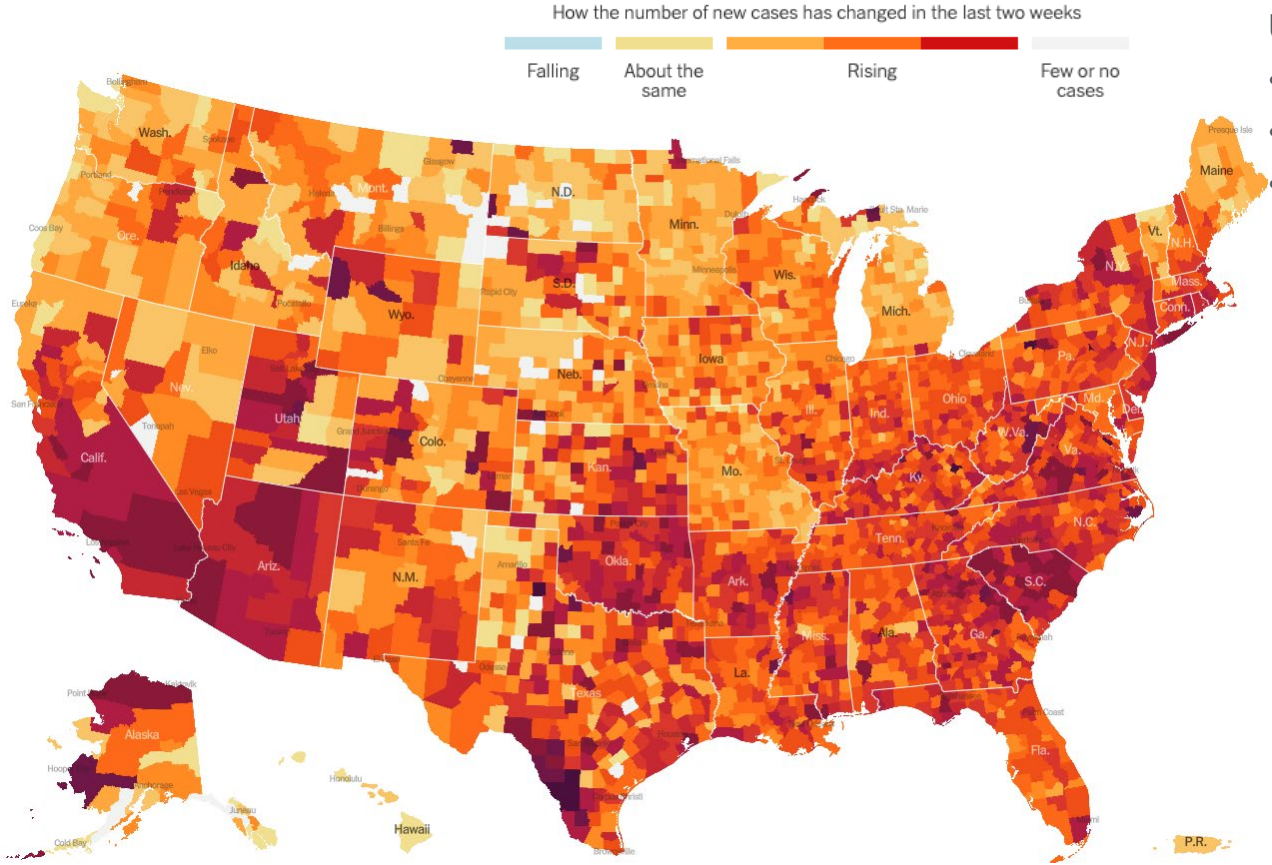
21 January 2021

Disclosures

- Research Support°
  - AiCuris, Janssen, Shire
- Paid Consultation
  - Adagio, AlloVir, Celltrion, Cidara, Genentech/Roche, Janssen, Shionogi, Viracor Eurofins
- Unpaid Consultation
  - Romark
- Data & Safety Monitoring Board Participation
  - NIH, Janssen, Merck, SAB Biotherapeutics, Sequiris, Takeda, Vitaeris

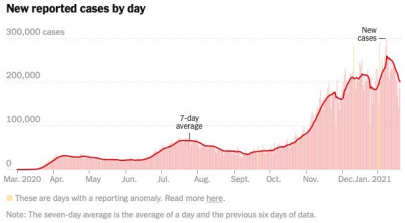
As of 10/19/20; ° Paid to Northwestern University.

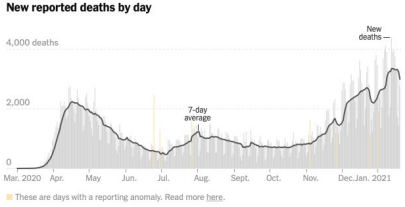
COVID-19: *Current Situation in the United States*

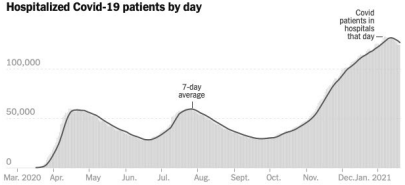


US Data on 120 January 2020

- COVID-19 Cases: 24,385,500 (23.5%)
- COVID-19 Deaths: 403,929 (19.0%)
- COVID-19 Hospitalized: 123,820







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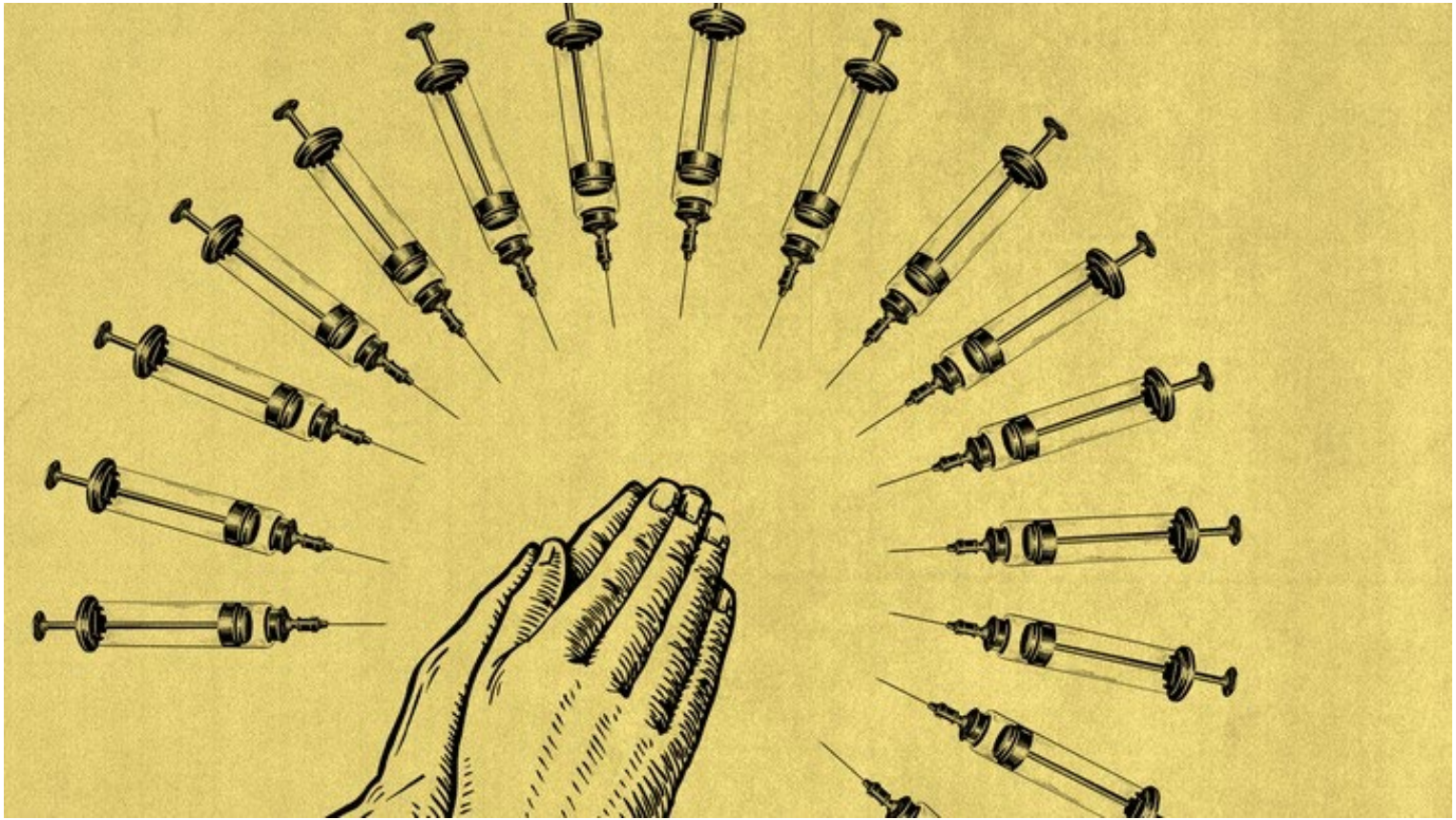
https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html - Accessed 20January 2021

SARS-CoV-2 Vaccines: *Current Status*

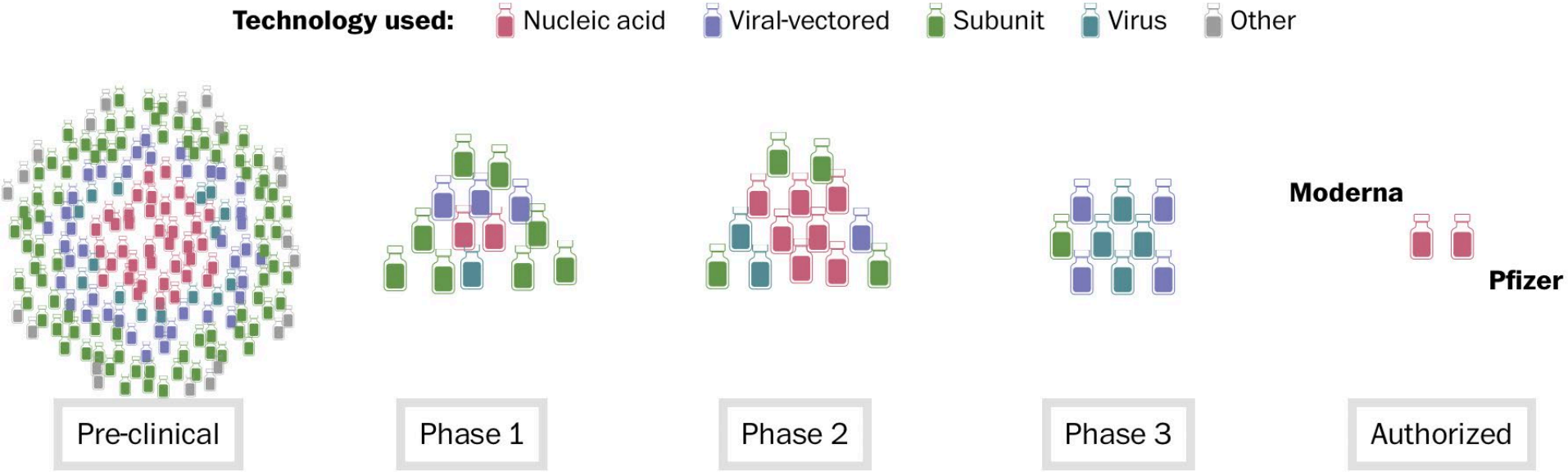


SARS-CoV-2 Vaccines: *Rapid Development*

Date	Milestone
Dec 1	Covid-19 illness documented (unpublicized Nov 17th)
Jan 10	SARS-CoV-2 virus sequenced
Jan 15	NIH designs mRNA vaccine in collaboration with Moderna
Mar 16	Moderna Phase 1l2 trial begins
May 2	Pfizer/BioNTech Phase 1l2 trial begins
July 14	Moderna Phase 1l2 trial published in NEJM
July 27, 28	Moderna and Pfizer/BioNTech Phase 3 trial begins
Aug 12	Pfizer/BioNTech Phase 1l2 published in Nature
October 22,27	Enrollment in both Phase 3 trials complete; >74,000 participants
Nov 9	Pfizer/BioNTech announces interim analysis efficacy > 90%
Nov 16	Moderna announces interim analysis efficacy 94.5%
Nov 18	Pfizer/BioNTech announces 95% efficacy as final result
Nov 20	1st EUA submitted by Pfizer/BioNTech
Nov 27	Distribution of vaccine by UAL charter flights throughout US
Dec 10	FDA External review of Pfizer/BioNTech EUA
Dec 11	Phase 1a Vaccination begins for health care professionals*

*Provisional on positive external review

COVID-19: *Prevention - Vaccines*



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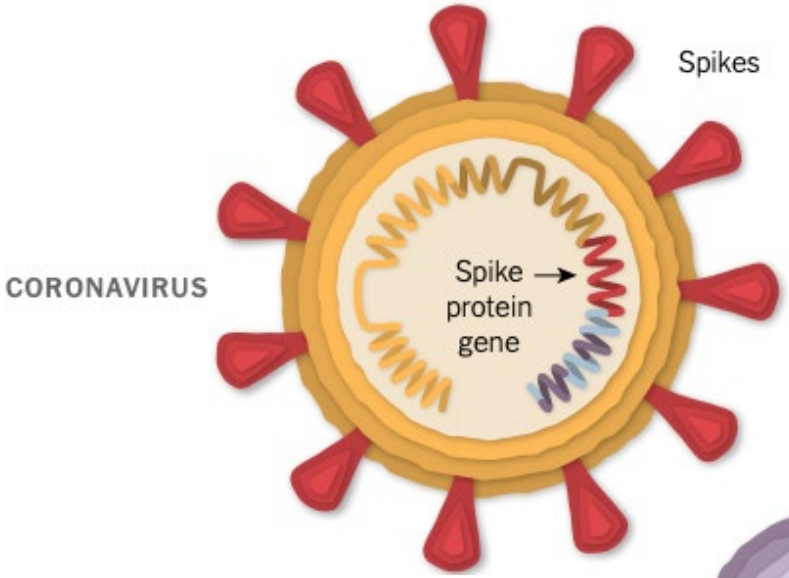
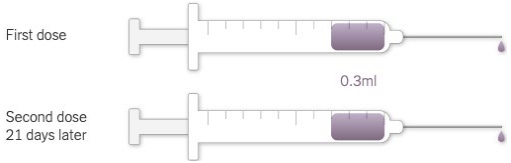
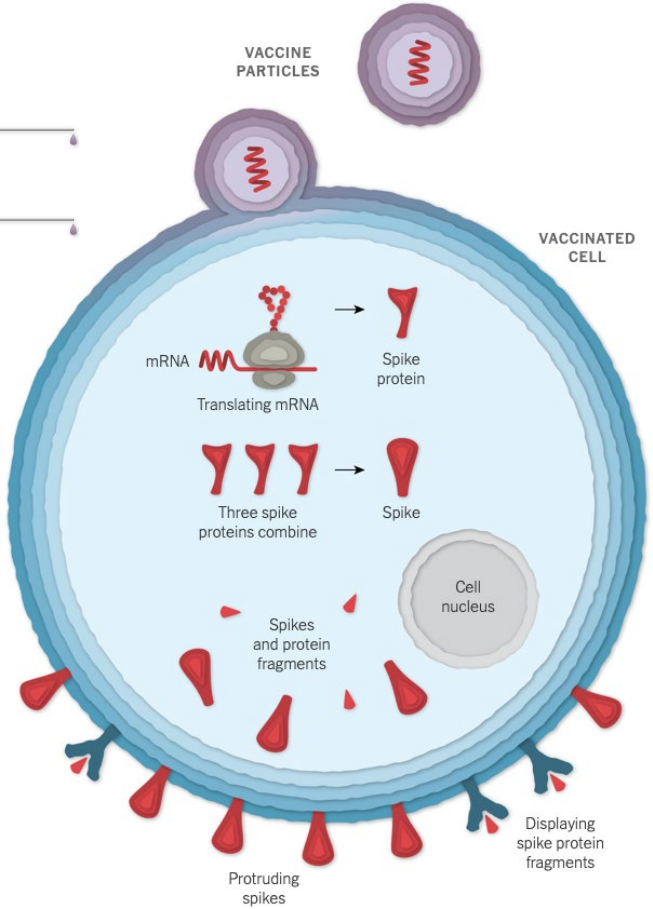
"These are the Top Coronavirus Vaccines to Watch." ***Washington Post***. 18 December 2020.

SARS-CoV-2 Vaccines : *mRNA Vaccines*





Lipid nanoparticles surrounding mRNA



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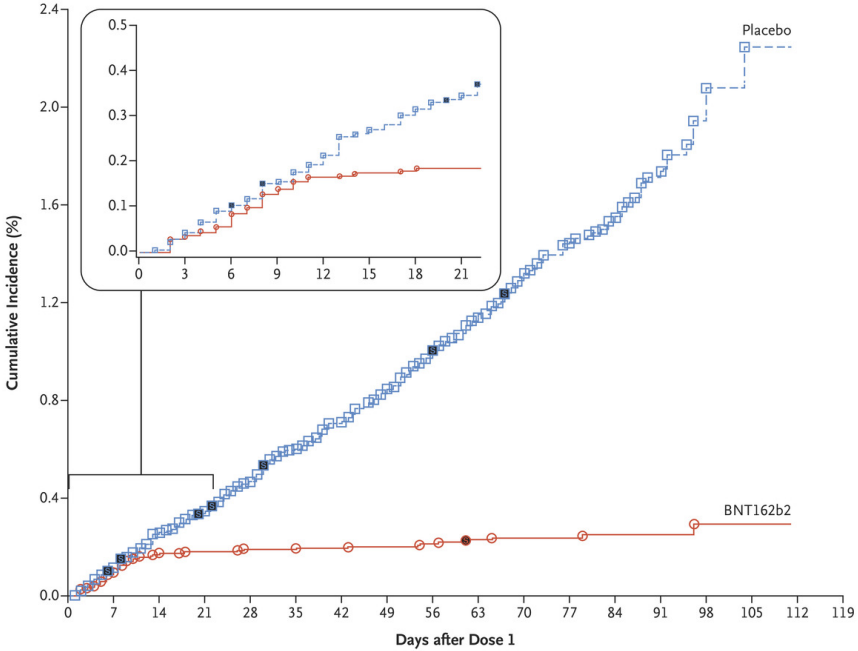
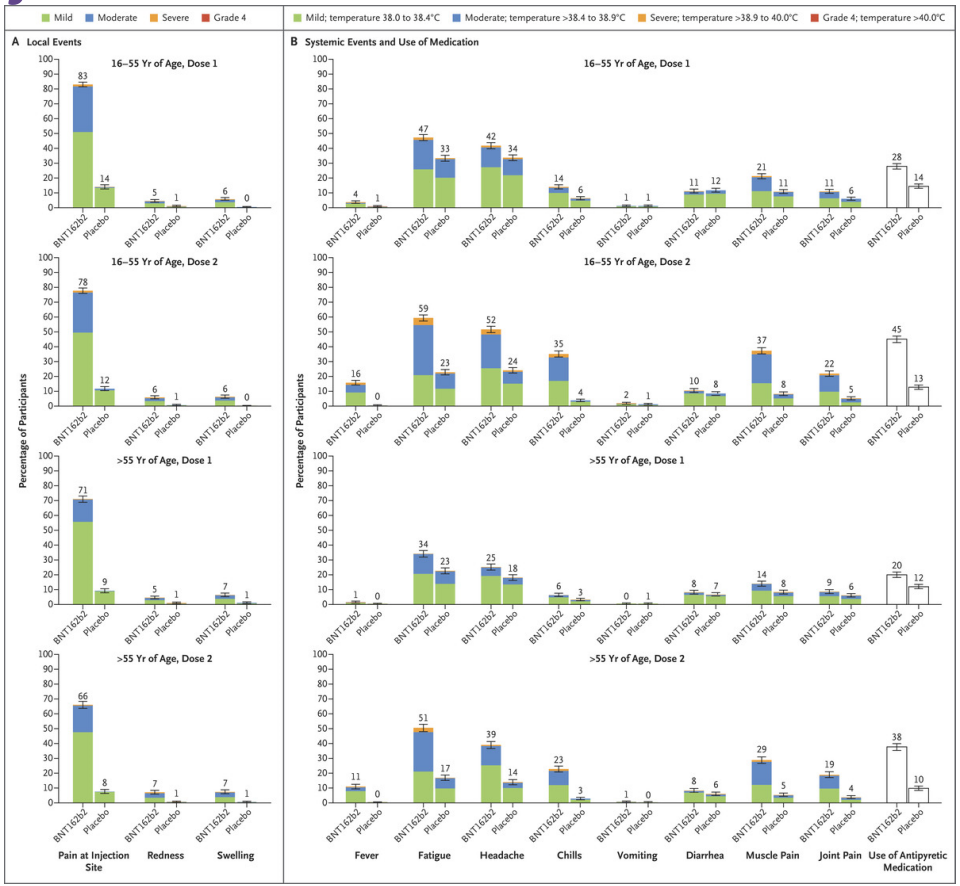
https://www.nytimes.com/interactive/2020/health/pfizer-biontech-covid-19-vaccine.html?referringSource=articleShare

SARS-CoV-2 Vaccine: *mRNA Pfizer Vaccine*



Efficacy End-Point Subgroup	BNT162b2, 30 μg (N=21,669)		Placebo (N=21,686)		VE (95% CI)
	No. of participants	Surveillance time *person-yr (no. at risk)*	No. of participants	Surveillance time *person-yr (no. at risk)*	*percent*
Covid-19 occurrence					
After dose 1	50	4.015 (21,314)	275	3.982 (21,258)	82.0 (75.6–86.9)
After dose 1 to before dose 2	39		82		52.4 (29.5–68.4)
Dose 2 to 7 days after dose 2	2		21		90.5 (61.0–98.9)
≥7 Days after dose 2	9		172		94.8 (89.8–97.6)



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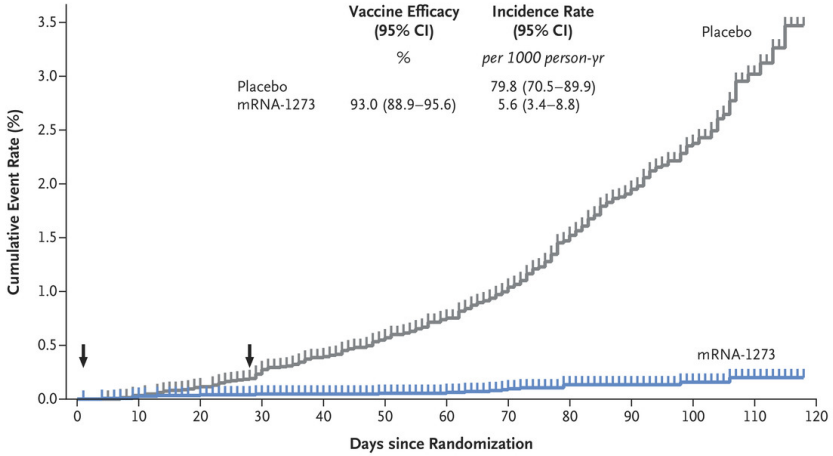
Pollack *et al*. ***N Eng J Med***. 2020: DOI: 10.1056/NEJMoa2034577.

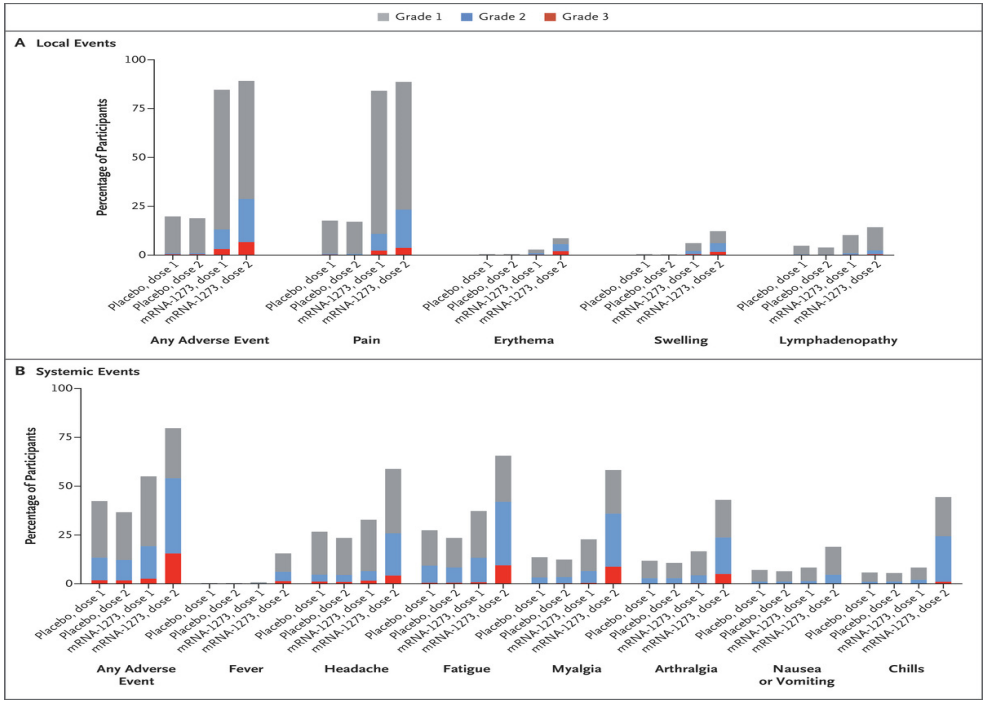
SARS-CoV-2 Vaccine: *mRNA Moderna Vaccine*



No. at Risk

Placebo	14,598	14,590	14,567	14,515	13,806	12,352	12,694	11,450	9736	6729	4067	1200	0
mRNA-1273	14,550	14,543	14,532	14,504	13,825	13,398	12,791	11,573	9911	6871	4179	1238	0

Covid-19 Onset	Placebo (N=14,598)	mRNA-1273 (N=14,550)
Randomization to 14 days after dose 1	11	5
14 Days after dose 1 to dose 2	35	2
Dose 2 to 14 days after dose 2	19	0
Starting 14 days after dose 2	204	12
Total (any time after randomization)	269	19



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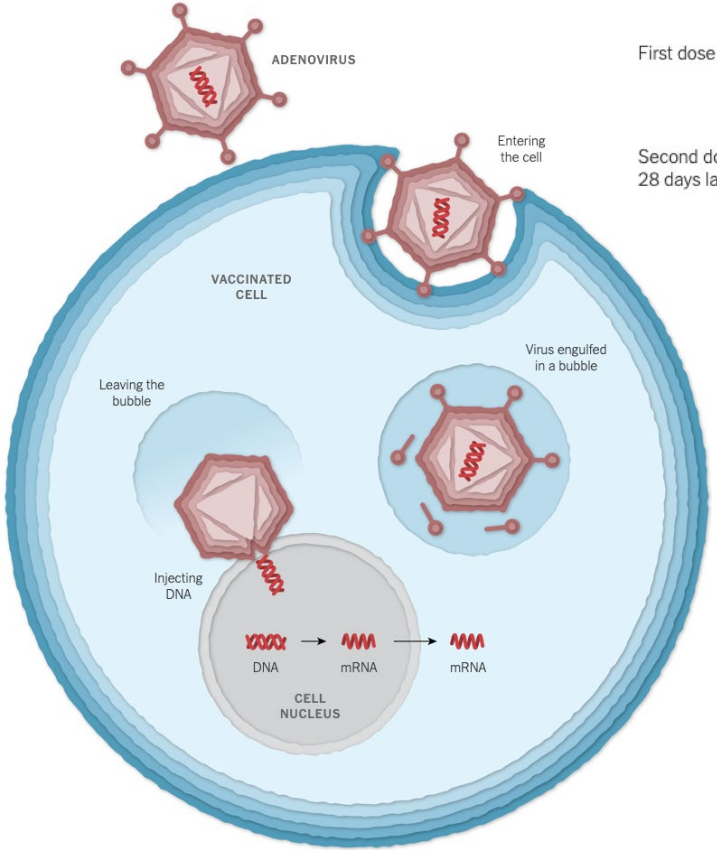
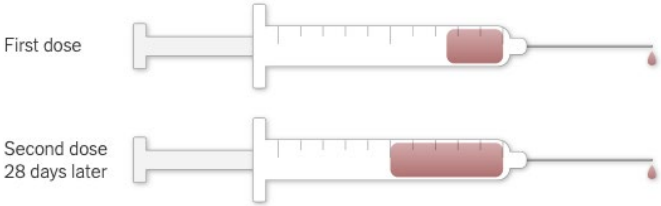
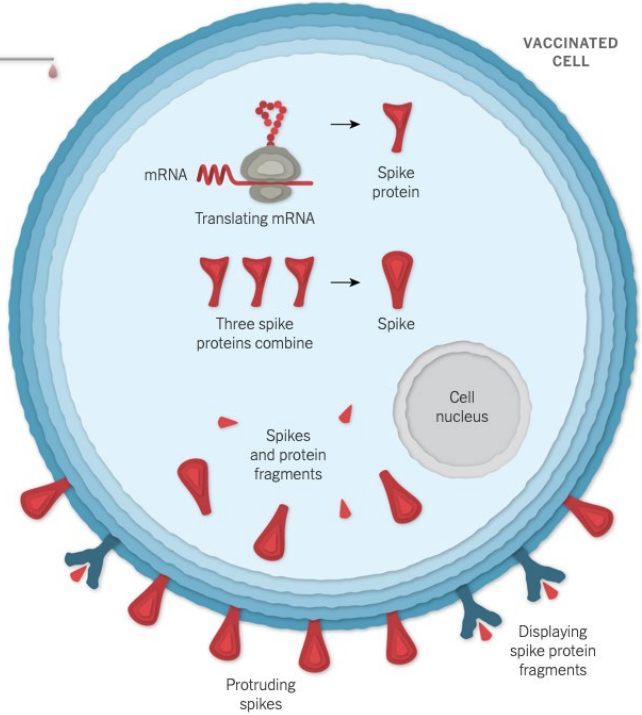
Baden *et al*. ***N Engl J Med***. 2020. DOI: 10.1056/NEJMoa2035389.

SARS-CoV-2 Vaccines : *Adenovirus Vector*







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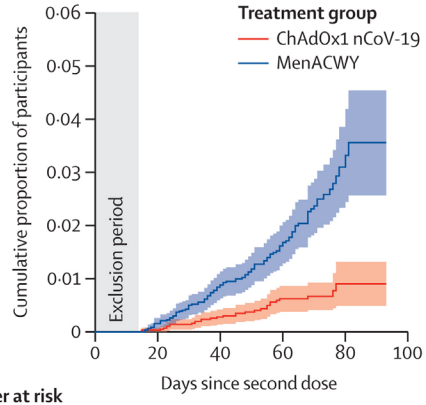
https://www.nytimes.com/interactive/2020/health/pfizer-biontech-covid-19-vaccine.html?referringSource=articleShare

SARS-CoV-2 Vaccine: *Adenovirus Vector – AstraZeneca/Oxford*

	Total number of cases	ChAdOx1 nCoV-19		Control		Vaccine efficacy (CI*)
		n/N (%)	Incidence rate per 1000 person-years (person-days of follow-up)	n/N (%)	Incidence rate per 1000 person-years (person-days of follow-up)	
All LD/SD and SD/SD recipients	131	30/5807 (0·5%)	44·1 (248 299)	101/5829 (1·7%)	149·2 (247 228)	70·4% (54·8 to 80·6)†
COV002 (UK)	86	18/3744 (0·5%)	38·6 (170 369)	68/3804 (1·8%)	145·7 (170 448)	73·5% (55·5 to 84·2)
LD/SD recipients	33	3/1367 (0·2%)	14·9 (73 313)	30/1374 (2·2%)	150·2 (72 949)	90·0% (67·4 to 97·0)‡§
SD/SD recipients	53	15/2377 (0·6%)	56·4 (97 056)	38/2430 (1·6%)	142·4 (97 499)	60·3% (28·0 to 78·2)
COV003 (Brazil; all SD/SD)	45	12/2063 (0·6%)	56·2 (77 930)	33/2025 (1·6%)	157·0 (76 780)	64·2% (30·7 to 81·5)‡
All SD/SD recipients	98	27/4440 (0·6%)	56·4 (174 986)	71/4455 (1·6%)	148·8 (174 279)	62·1% (41·0 to 75·7)
Other non-primary symptomatic COVID-19 disease¶	18	7/5807 (0·1%)	10·3 (248 299)	11/5829 (0·2%)	16·3 (247 228)	36·4% (−63·8 to 75·3)‡
Any symptomatic COVID-19 disease	149	37/5807 (0·6%)	54·4 (248 299)	112/5829 (1·9%)	165·5 (247 228)	67·1% (52·3 to 77·3)
Asymptomatic or symptoms unknown (COV002)	69	29/3288 (0·9%)	69·8 (151 673)	40/3350 (1·2%)	96·0 (152 138)	27·3% (−17·2 to 54·9)
LD/SD recipients	24	7/1120 (0·6%)	41·4 (61 782)	17/1127 (1·5%)	100·6 (61 730)	58·9% (1·0 to 82·9)‡
SD/SD recipients	45	22/2168 (1·0%)	89·4 (89 891)	23/2223 (1·0%)	92·9 (90 408)	3·8% (−72·4 to 46·3)
Any NAAT-positive swab	221	68/5807 (1·2%)	100·0 (248 299)	153/5829 (2·6%)	226·0 (247 228)	55·7% (41·1 to 66·7)



Number at risk (number censored)						
ChAdOx1 nCoV-19	5807 (0)	5639 (189)	4779 (1162)	3181 (2620)	499 (5300)	0 (5777)
MenACWY	5829 (0)	5657 (182)	4765 (1164)	3146 (2636)	435 (5322)	0 (5728)

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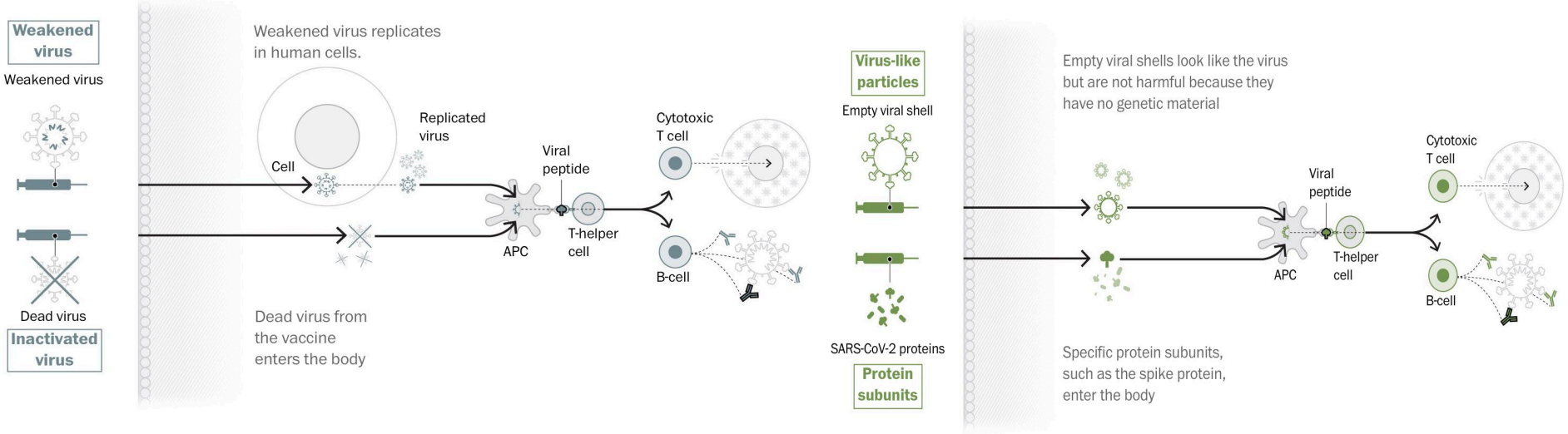
Voysey *et al*. ***Lancet***. 2020: DOI: 10.1016/S0140-6736 (20)32661-1.

COVID-19: *Protein Vaccines*



Weakened and inactivated virus vaccines, developed by...

Beijing Institute of Biological Products; Sinopharm	PC	P1	P2	P3	A
Bharat Biotech	PC	P1	P2	P3	A
Sinopharm	PC	P1	P2	P3	A
Sinovac	PC	P1	P2	P3	A
Chinese Academy of Medical Sciences	PC	P1	P2	P3	A
Research Institute for Biological Safety Problems, Republic of Kazakhstan	PC	P1	P2	P3	A

Subunit vaccines, developed by...

Novavax	PC	P1	P2	P3	A
Anhui Zhifei Longcom; Chinese Academy of Sciences	PC	P1	P2	P3	A
Federal Budgetary Research Institution (FBRI) State Research Center of Virology and Biotechnology "VECTOR"	PC	P1	P2	P3	A
Instituto Finlay de Vacunas	PC	P1	P2	P3	A
SpyBiotech; Serum Institute of India	PC	P1	P2	P3	A

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"These are the Top Coronavirus Vaccines to Watch." ***Washington Post***. 19 December 2020.

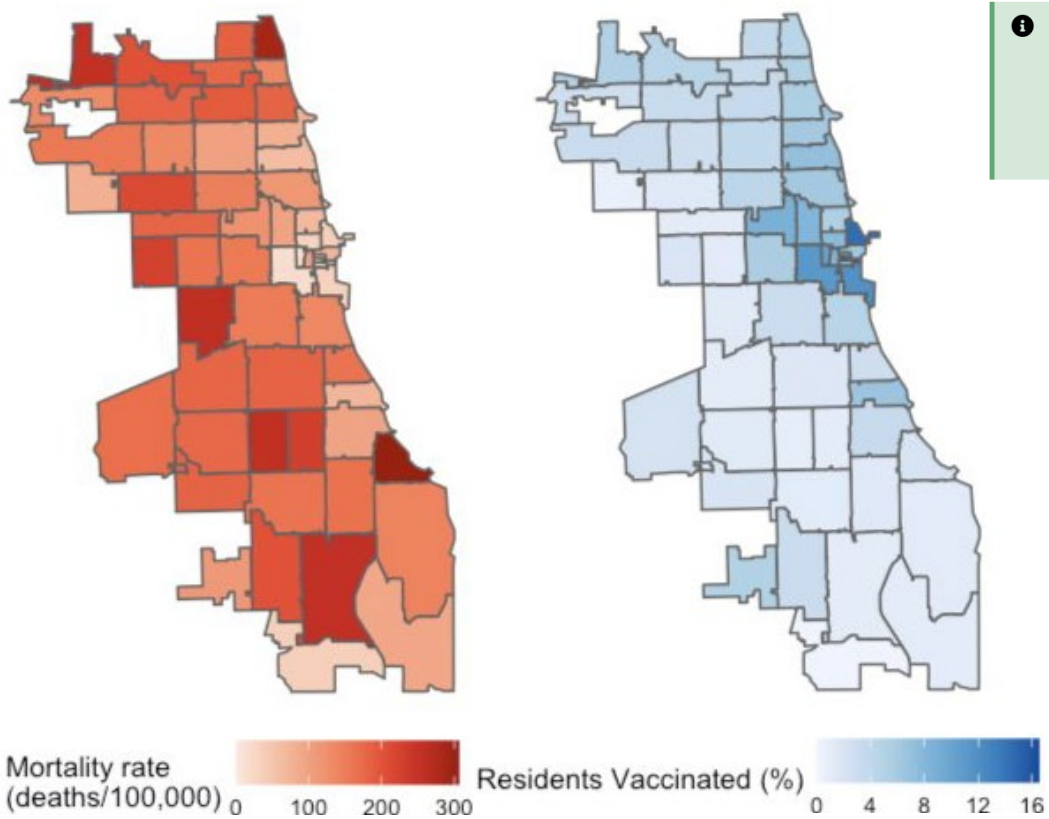
SARS-CoV-2 Vaccines: *Time to Vaccination*

Proposed Phase 1 & 2 allocation, December 2020

Phase	Groups recommended for vaccination	Number of persons in each group (millions)	Number of unique* persons in each group (millions)	Total* (millions)
1a	Health care personnel	21	21	24
	Long-term care facility residents	3	3	
1b	Frontline essential workers	30	30	49
	Persons aged 75 years and older	21	19	
1c	Persons aged 65-74 years	32	28	129
	Persons aged 16-64 years with high-risk conditions	110	81	
	Essential workers not recommended in Phase 1b	57	20	
2	All people aged 16 years and older not in Phase 1, who are recommended for vaccination			

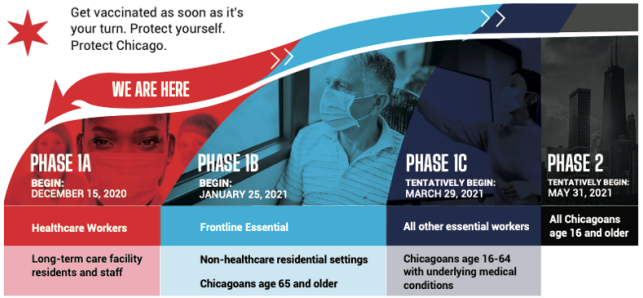
CDC Advisory Committee on Immunization Practices.

SARS-CoV-2 Roll-Out: *Chicago Experience*



The City of Chicago is making plans for a transitional COVID-19 vaccine distribution phase, bridging phase 1A and 1B. Hospitals and outpatient sites enrolled as COVID-19 vaccine providers will continue to prioritize healthcare workers, especially non-hospital based healthcare workers in tier 1A, for vaccination. Starting January 18, if vaccination providers have vaccine available and do not have tier 1A healthcare workers scheduled for vaccination, they may move to highest risk individuals that are over 65 years old and live or work in Chicago.

Prioritization will be given to patients over 75 years of age, or patients over 65 years of age with significant underlying conditions, based on clinical judgment. City-run Points of Dispensing (PODs) will continue to focus on providing vaccine to tier 1A healthcare workers, by appointment only. While we wait for the federal government to send more vaccine doses, we continue working hard to make sure this vaccine is prioritized for populations who are most at risk for severe outcomes.



Population: 2,705,5994

Vaccinated: 105,424 (0.95%)

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SARS-CoV-2 Roll-Out: *Chicago Experience*

Phase	GOAL: Prevent COVID-19 hospitalizations and deaths • Phase opens to whole group, with efforts to prioritize by COVID-19 risk in order below • Most vaccinated in residential and healthcare settings (e.g. clinics, hospitals, pharmacies)	GOAL: Preserve services essential to functioning of society and prevent COVID-19 outbreaks • Phase opens to whole group, with efforts to prioritize by COVID-19 risk in order below • Most vaccinated in employer-based settings
1A Begin on December 15, 2020 **(Most vaccinated in January)**	**Long-term care and other residential healthcare facilities** • Skilled nursing facilities • Assisted living facilities • Behavioral health residential facilities • Developmentally disabled residential facilities	**Health care workers** • Hospital-based • Non-hospital based (e.g. doctors' offices, dentists' offices, outpatient clinics, laboratories, pharmacies, home health) • Community-based (e.g. *Protect Chicago* outreach)
1B Begin on January 25, 2021 **(Most vaccinated in February and March)**	**Chicagoans age 65 and older** • Chicagoans age 75 and older • Chicagoans age 65-74 with underlying medical conditions • All Chicagoans age 65 and older • **Non-health care residential settings** • Correctional settings • Homeless shelters • Other residential settings with local outbreaks	**Frontline essential workers** • Correctional workers and first responders • Grocery store workers and manufacturing/factory settings with outbreaks • Daycare, K-12 and early education workers • Public transit, other manufacturing, and agriculture workers • Continuity of government and postal workers
1C Tentatively begin on March 29, 2021 (Most vaccinated in April and May)	**Chicagoans age 16-64 with underlying medical conditions**	**All other essential workers**
2 Tentatively begin on May 31, 2021	**All persons aged ≥16 years not previously recommended for vaccination**	

*As vaccine is authorized for younger children, they will be added to the plan

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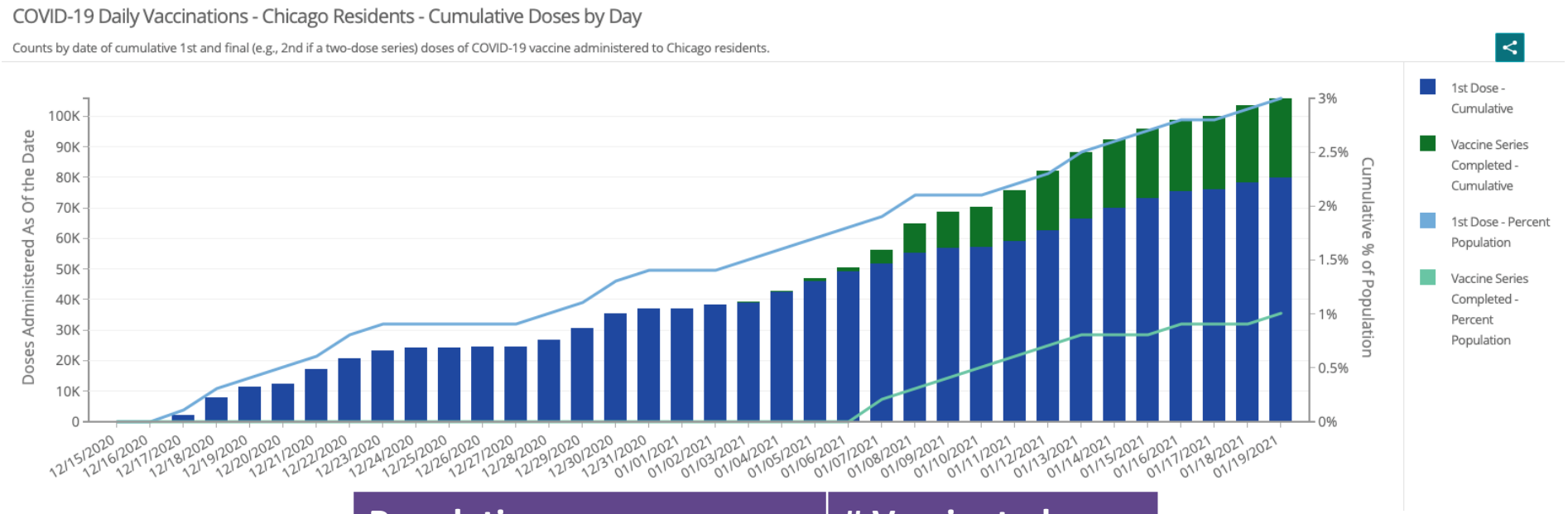
SARS-CoV-2 Roll-Out: *Chicago Experience*



Population	# Vaccinated
Total First Dose	79,984
Total Completed 2 Doses	25,861

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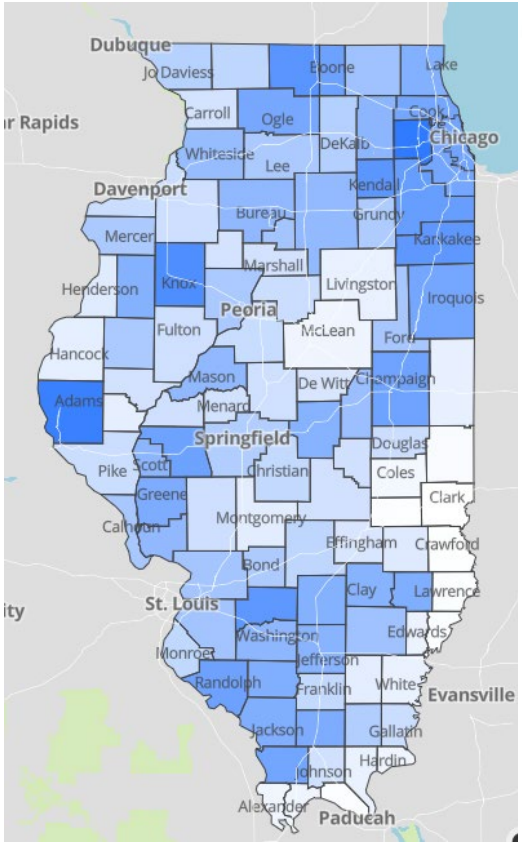
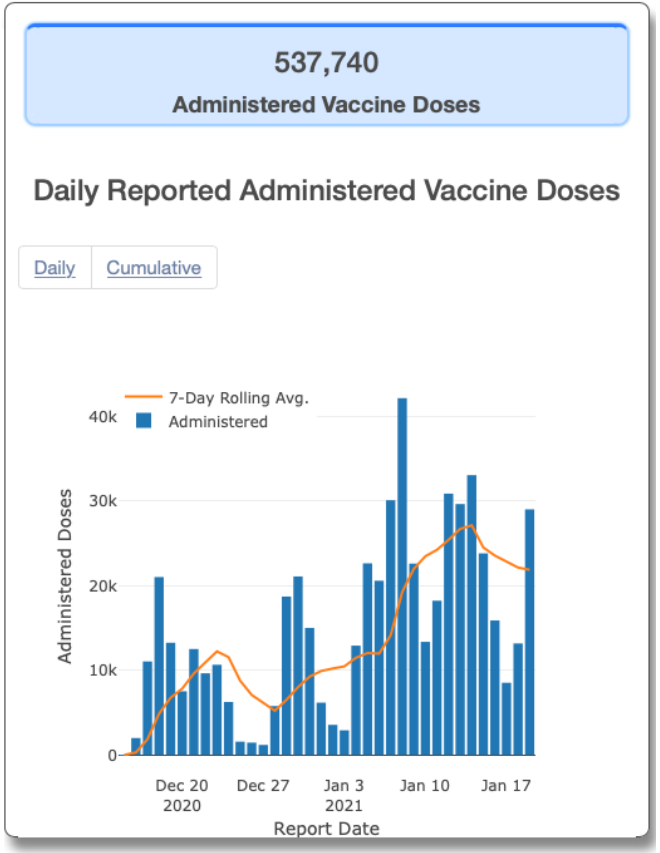
https://www.chicago.gov/city/en/sites/covid-19/home/vaccine-data.html

SARS-CoV-2 Roll-Out: *Illinois Experience*





Illinois Vaccination Data

Total Illinois Doses 1,388,200	Total Administered Doses 537,740
LTC Allocated Doses 524,050	LTC Administered Doses 86,180

Vaccine Administration 7-Day Rolling Average 21,869

112,823
Population Fully Vaccinated

0.89%
% Population Fully Vaccinated

12,741,080
Population

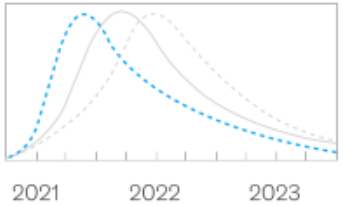
https://www.dph.illinois.gov/covid19/vaccinedata?county=Illinois

SARS-CoV-2 Vaccines: *Time to Herd Immunity*

The probability of reaching COVID-19 herd immunity in the United States is highest in the third or fourth quarter of 2021 but could shift.

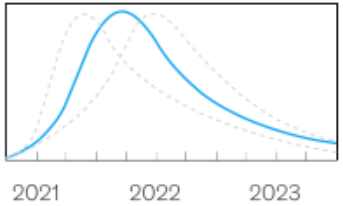
Probability of functional end[1] to COVID-19 pandemic in US by quarter (illustrative)

Early (Q2 2021)



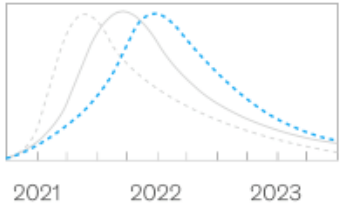
- COVID-19 vaccine with high efficacy arrives sooner than expected
- Timeline of manufacturing, distribution, and administration of COVID-19 vaccine is shorter than expected
- Cross-immunity from other coronaviruses proves significant
- There is broad-based willingness to be vaccinated

Most likely (Q3/Q4 2021)



- ≥1 COVID-19 vaccine is authorized by end of 2020 or early 2021
- COVID-19 vaccine is distributed to a sufficient portion of population in ~6 months
- There is broad-based willingness to be vaccinated

Late (2022 or later)



- Early COVID-19-vaccine candidates have low efficacy or low coverage (eg, side effects, slow adoption)
- Timeline of manufacturing, distribution, and administration of COVID-19 vaccine is longer than expected
- Immunity duration is very short

https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-will-the-covid-19-pandemic-end#

Are you a registered organ donor?

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Questions?

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