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COVID-19 Vaccination Prioritization Scenarios and Their Effects on Eligibility by Poverty Level, Race, and Ethnicity

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Abstract

Early vaccination priorities have in most U.S. jurisdictions focused on healthcare workers, long-term care residents, and adults age 75 and older. How the nation allocates vaccine resources for the remaining population poses difficult decisions for policymakers (Biggerstaff, 2020; Dooling et al., 2020). This Research Findings report uses data from the Medical Expenditure Panel Survey to examine how three hypothetical prioritizations would affect the vaccine eligibility of groups defined by poverty level and race and ethnicity. The first hypothetical scenario prioritizes most essential workers ahead of those in the under-65 population with COVID-19-related health risks. A second scenario reverses this order by prioritizing those with COVID-19-related health risks ahead of non-health essential workers. A third prioritization is based solely on the administratively simple characteristic of age. For each hypothetical prioritization, we present the overall size of each priority group, and we show how alternative strategies would affect eligibility across poverty levels and across race and ethnicity.

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COVID-19 Vaccination Prioritization Scenarios and Their Effects on Eligibility by Poverty Level, Race, and Ethnicity

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Introduction

Policymakers at all levels of government are currently working to distribute the new COVID-19 vaccine to the U.S. population. Prioritizing vaccine resources across population groups poses difficult decisions for policymakers (Biggerstaff, 2020; Dooling et al., 2021). What are the implications of alternative prioritizations for national economic security versus public health and safety? Should resources be prioritized for individuals with the greatest risk of exposure to SARS-CoV-2, those most likely to develop severe COVID-19 if they become infected, those most likely to transmit the virus to others, or some combination? Should distribution be based on information regarding employment and health, or more simply based on age, and how should that information be verified?

The Centers for Disease Control and Prevention (CDC) recently published guidelines for vaccination priority that seek to balance these competing objectives (CDC, 2021; White House, 2021). The guidelines prioritize groups based on long-term care residence, age, health status, and occupation, reflecting guidance from the Advisory Committee on Immunization Practices (ACIP) (McClung et al., 2020; Dooling et al., 2021). In addition to these national recommendations, every state is tailoring its vaccination plan to local factors, resulting in considerable variation across the country.

Against this backdrop, this Research Findings report explores how different prioritization strategies can affect vaccine eligibility across poverty levels and across race/ethnicity. Understanding the implications of prioritization strategies on these dimensions takes on particular importance given striking inequities across the population in health risk factors and in COVID-19 mortality (Centers for Disease Control and Prevention, 2020a).

We use data from the 2014–2017 Medical Expenditure Panel Survey (MEPS), sponsored by the Agency for Healthcare Research and Quality (AHRQ, 2019), to construct hierarchical population estimates for potential vaccine priority groups. MEPS is a household survey of the civilian noninstitutionalized population that collects a wide range of data including demographic characteristics, health conditions, use of medical services, charges and source of payments, access to care, satisfaction with care, health insurance coverage, income, and employment. It does not include nursing home residents or adults who are incarcerated, two groups with particularly high rates of COVID-19 morbidity and mortality. Nevertheless, MEPS is a valuable resource for conducting vaccine prioritization analyses of the rest of the population, because many key variables, including detailed employment and detailed health risk data, as well as income and race and ethnicity, are

collected in the same survey—thereby capturing patterns of overlap across vaccine groups.

We present three scenarios for vaccine prioritization. All three scenarios begin by prioritizing healthcare workers and then individuals age 65 and older (reflecting announcements already made in many states as of February 2021). The first scenario next prioritizes other groups of essential workers based on their having above-average risk of infection and potential to spread infection to others. The second scenario instead prioritizes adults at increased risk of severe COVID-19, conditional on infection. The third scenario examines the most administratively simple strategy of focusing solely on age (after healthcare workers).

The priority groups we examine differ from those used in ACIP and CDC recommendations in several ways. Our definition of essential workers is based on U.S. Department of Homeland Security guidelines, and we combine this with information on ability to work at home. This likely differs from ACIP's essential frontline and other essential worker categories. Also, our definition of adults with increased risk or potentially increased risk of severe COVID-19 includes adults with treated high blood pressure and current smokers, whereas neither risk factor would qualify an adult for inclusion in ACIP or CDC groups with underlying medical conditions. Finally, note also that all three prioritization scenarios follow many states in giving high priority to adults age 65 to 74.

For each of the three prioritization scenarios we present estimates of eligibility group sizes and cumulative distributions stratified by health risk, occupation, and, of particular interest in this study, poverty level and race and ethnicity. Our focus is primarily on early prioritization, when infection rates are high and before the share of the population with immunity reaches levels that substantially reduce new infections. Our estimates focus on the characteristics of adults who would be eligible for the vaccine. The rates at which eligible populations become vaccinated will depend on a range of factors outside the scope of this analysis.

Highlights

- The strategy in many states of granting relatively high priority to adults age 65 and older results in greater vaccine eligibility among adults in higher-income families and White non-Hispanic adults than among adults living in poverty or racial and ethnic minorities, respectively.
- Prioritizing adults at increased risk of severe COVID-19 ahead of (non-healthcare) high-priority occupation groups would increase access to the vaccine among adults living in poverty and Black non-Hispanic adults. However, this would delay eligibility of some workers who have increased risk of exposure and increased risk of transmission to others.
- Distributing the vaccine by age would simplify eligibility determinations, but would slow vaccine eligibility for a number of key population subgroups.

Findings

Population totals and percentages

Table 1 presents estimates of average annual population totals and percentages for each of the key dimensions of our analysis. Overall, there were 248.0 million adults on average in the civilian noninstitutionalized population during the 2014–2017 study period. The estimates in Table 1 highlight the fact that 151.3 million or 61.0 percent of adults had health conditions or other health risks (such as age or smoking) meeting CDC guidelines for increased risk (or for having the potential for increased risk) for severe COVID-19 (CDC, 2020b).

For purposes of vaccine planning, it is important to recognize there can be substantial overlap in the priority categories in Table 1, such as when members of various occupation groups are age 65 or older or have other COVID-19 risk factors. The remaining tables in this analysis disentangle these overlapping risk groups by presenting hierarchical estimates that remove from each risk tier any adults who would already be prioritized for vaccine receipt in a higher risk tier.

Vaccine prioritization scenario #1

Tables 2 and 3 present results for our first prioritization. Reflecting ongoing vaccine distribution in most states as of mid-January 2021, we begin with healthcare workers, followed by adults age 75 and older, as well as those age 65 to 74. Next, we prioritize selected occupation groups, followed by the larger groups of other essential workers who cannot work from home and adults with health risk factors for severe COVID-19 other than age. Finally, we have the other worker categories and non-working adults without health risk factors.

Table 3 presents cumulative distribution estimates, showing the rates at which this first prioritization scenario reaches populations of interest. The table shows that adults in higher-income families and White non-Hispanic adults are more likely to be in the age 65 to 74 group than adults with family incomes under the federal poverty level or racial and ethnic minorities. In other words, giving high priority to adults age 65 to 74 results in greater vaccine eligibility among adults with higher family incomes and White non-Hispanic adults than among adults living in poverty or among racial and ethnic minorities, respectively.

The boldface font in Table 3 shows the group that contains the median of the U.S. adult population (the midway point of the adult population when ranked according to scenario #1). This median is reached when vaccination is made available to other essential workers who cannot work at home. At that point, vaccine eligibility would have reached 63.0 percent of adults at increased risk of severe COVID-19. In contrast, only 32.8 percent of adults with family incomes under the federal poverty level would have been made eligible (because, as Table 3 shows, adults living in

poverty are less likely than other adults to be employed in the essential occupations prioritized in this scenario). Asian non-Hispanic adults also would be relatively late to gain access, due to being underrepresented in the prioritized occupation groups.

Vaccine prioritization scenario #2

Tables 4 and 5 present results from a distribution strategy that prioritizes adults at increased risk of severe COVID-19, instead of selected workers, as the next group after persons age 65 to 74. Table 5 shows that adults at increased risk of severe COVID-19 would have all been made eligible within the top 64.1 percent of adults. This is, not surprisingly, a faster pace than in scenario #1. The opposite is true for the vaccine eligibility of essential workers. The second column of results in Table 5 shows that essential workers who cannot work at home (inclusive of school employees) would not have all become eligible for vaccination until 77.2 percent of the population gained eligibility (versus 54.6 percent in scenario #1). Table 5 shows that adults with family incomes below the poverty level are more likely, compared to adults with higher family incomes, to have health factors increasing their risk of severe COVID-19, so that they receive eligibility substantially more quickly in this scenario. Once again, Asian non-Hispanic adults would receive lower vaccine eligibility than other racial and ethnic groups in this distribution scenario, because Table 5 shows they are less likely to have conditions associated with increased risk of severe COVID-19.

Vaccine prioritization scenario #3

Tables 6 and 7 present results from a distribution strategy that puts healthcare workers first, then prioritizes all remaining adults solely based on their age. This approach has the advantage of simplicity, because, although it is important to recognize that not all adults in the United States have or are willing to show government-issued identification, basing eligibility on age would avoid complications surrounding the documentation of employment characteristics or health status. Starting after the age 65–74 group, because all three scenarios align up to that point, we see that basing further eligibility decisions solely on age reaches large numbers of adults with increased risk of severe COVID-19 at what is initially a faster pace than scenario #1. This is because age is strongly correlated with health risk. However, scenario #3 does not reach all increased-risk adults until the entire adult population is made eligible. Essential workers who cannot work at home would also not all be reached until the entire adult population was made eligible. After the 65–74 age group, basing distribution solely on age results in the adults in families with incomes under the federal poverty level becoming eligible more quickly than if the next group is other essential workers who cannot work at home (scenario #1) and more slowly than if the next group is adults with increased risk of severe COVID-19 (scenario #2). This strategy results in greater vaccine access for Asian non-Hispanic adults and substantially worse access for Hispanic

adults, with the clear advantage being for White non-Hispanic adults, reflecting their higher average age.

Data Source

The estimates shown in this Research Findings report are drawn from analyses conducted by the MEPS staff from the MEPS Full-Year Consolidated files: HC-171 (2014), HC-181 (2015), HC-192 (2016), and HC-201 (2017). Non-public detailed occupation and industry variables were used for the years 2014–2017. The public use files are available at https://meps.ahrq.gov/mepsweb/data_stats/download_data_files.jsp. We supplemented MEPS with information on ability to work at home from the 2017 American Time Use Survey (ATUS), sponsored by the Bureau of Labor Statistics. Our analysis examined only the civilian noninstitutionalized population, thereby excluding adults in nursing homes and long-term care facilities, as well as adults who are incarcerated—groups that have experienced high COVID-19 morbidity and mortality. Our data are from 2014–2017 and therefore do not measure any changes in employment or health that may have occurred in response to the pandemic.

Definitions

Industry and occupation

Using four-digit Census occupation and industry codes, we identify essential workers according to U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency (CISA) guidelines regarding essential workers, issued on March 28, 2020 (CISA, 2020a) and subsequently updated to include school employees (CISA, 2020b). The food sector includes agriculture, food manufacture, and wholesale and retail food distribution. It excludes restaurant and bar employees, who are coded as nonessential employees. It is important to recognize that the CISA guidelines are only one of many possible ways to define essential workers. In particular, although our estimates account for ability to work at home and offer separate estimates on key industry groups, our definition of essential does not specifically incorporate the likelihood of contact with members of the public.

Work at home

Ability to work at home is imputed from the 2017 ATUS, sponsored by the Bureau of Labor Statistics (Hofferth, Flood, Sobek, & Backman, 2020). We used weighted sequential cold-deck imputation by detailed industry and occupation, as well as race/ethnicity, age, sex, and education. The ATUS provides a pre-pandemic measure of ability to work at home. Working from home clearly increased during the pandemic, in terms of both number of hours at home for those already able to work at home and increases in the number of adults who were able to work at home.

Age

Age is categorized based on the person's age at the end of the calendar year (or the last time a person was observed, for those leaving the MEPS sample during the year due to reasons including death, institutionalization, or becoming an active-duty member of the military).

Race-ethnicity

Race and ethnicity are defined for respondents whose single reported race was White, Black, or Asian, and for respondents of Hispanic ethnicity (any race). Results are not shown separately for respondents of multiple races or for other racial and ethnic groups, although all groups are included in our estimates for the total population.

Poverty

Four income groups are defined based on total family income as a percentage of the federal poverty level: under 100% of the federal poverty level, 2) 100–199 percent of the federal poverty level, 3) 200–399 percent of the federal poverty level, and 4) 400 percent of the federal poverty level and higher. Family income is constructed by summing all sources of income across all family members. Next, total family income value is divided by the appropriate poverty threshold, based on family size and composition, as well as state of residence.

Health risk measures

MEPS contains many, but not all, of the health risks identified in CDC guidance (CDC, 2020b) as placing individuals at increased risk of severe COVID-19. We classify adults as being at increased risk of severe COVID-19 if they had obesity (body mass index of 30 kg/m² or greater), were age 65 or older, or were being treated for any of the following conditions: diabetes, cancer (other than non-melanoma skin cancers), emphysema or other chronic obstructive pulmonary disease, kidney disease, or coronary heart disease (Selden and Berdahl, 2020, 2021; Selden, Berdahl, & Fang, 2020). We also include in our increased risk group current smokers and those with treated asthma or high blood pressure—factors identified by CDC as potentially placing adults at increased risk of severe COVID-19. CDC risk factors we did not include in our measure include pregnancy, sickle cell disease, immunocompromised state, and Down syndrome.

About MEPS-HC

The Medical Expenditure Panel Survey Household Component (MEPS-HC) collects nationally representative data on healthcare use, expenditures, sources of payment, and insurance coverage for the U.S. civilian noninstitutionalized population. The MEPS-HC is cosponsored by the Agency for Healthcare Research and Quality (AHRQ) and the National Center for Health Statistics (NCHS). More information about MEPS-HC can be found on the MEPS website at <https://meps.ahrq.gov/mepsweb>.

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Table 1: Population Estimates of Adults by Age, COVID-19 Health Risk, Employment, Poverty, and Race/Ethnicity, 2014–2017

Group	N	Population	(SE)	Percentage of Population	(SE)
All adults	95,830	248,004,982	(4,560,794)	100.0%	(0.0%)
Age groups					
75+	7,557	21,291,749	(696,091)	8.6%	(0.2%)
65–74	10,350	29,134,245	(764,732)	11.7%	(0.2%)
55–64	15,313	41,512,935	(1,023,703)	16.7%	(0.3%)
45–54	16,791	42,435,518	(917,586)	17.1%	(0.2%)
35–44	16,704	40,008,860	(1,028,569)	16.1%	(0.3%)
18–34	29,115	73,621,674	(1,707,830)	29.7%	(0.4%)
Increased risk of severe COVID-19	58,705	151,273,642	(2,926,364)	61.0%	(0.4%)
Employment groups					
Health workers	6,256	16,962,321	(549,685)	6.8%	(0.2%)
Safety, postal, transportation, utility (unable to WAH)	1,422	4,219,883	(219,097)	1.7%	(0.1%)
Food (unable to WAH)	3,218	7,022,946	(319,704)	2.8%	(0.1%)
School workers	3,194	9,933,717	(344,381)	4.0%	(0.1%)
Other essential workers (unable to WAH)	20,148	52,209,698	(1,155,485)	21.1%	(0.3%)
Other essential workers (able to WAH)	9,966	31,821,051	(909,701)	12.8%	(0.3%)
Other workers	13,484	35,080,977	(881,929)	14.1%	(0.2%)
Other adults (not workers)	38,142	90,754,390	(1,891,484)	36.6%	(0.4%)
Poverty level					
Under 100% FPL	17,139	28,640,944	(855,119)	11.5%	(0.3%)
100% to 199% FPL	20,656	41,789,212	(920,810)	16.9%	(0.3%)
200% to 399% FPL	28,201	70,942,690	(1,516,962)	28.6%	(0.3%)
400% FPL and Over	29,803	106,520,426	(2,646,321)	43.0%	(0.6%)

Group	N	Population	(SE)	Percentage of Population	(SE)
Race and ethnicity					
White, non-Hispanic	41,000	157,726,005	(3,771,300)	63.6%	(0.9%)
Black, non-Hispanic	17,943	29,349,300	(1,266,542)	11.8%	(0.5%)
Asian, non-Hispanic	7,205	14,451,027	(997,686)	5.8%	(0.4%)
Hispanic (all races)	26,962	39,191,379	(1,842,275)	15.8%	(0.7%)

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component, 2014–2017, augmented with information on ability to work at home from the American Time Use Survey, 2017. Sample size 95,830.

SE=standard error, WAH=work at home, FPL=Federal Poverty Level

Table 2: COVID-19 Vaccine Priority Groups, Vaccination Scenario #1, 2014–2017

Group	Hierarchical Estimates*			
	Population	Cumulative Population	Percentage of Population	Cumulative Percentage of Population
Health workers	16,962,321	16,962,321	6.8%	6.8%
Age 75+	21,172,355	38,134,676	8.5%	15.4%
Age 65–74	28,196,497	66,331,173	11.4%	26.7%
Safety, postal, transportation, utility (unable to WAH)	4,048,357	70,379,530	1.6%	28.4%
Food (unable to WAH)	6,573,995	76,953,525	2.7%	31.0%
School workers	9,315,291	86,268,817	3.8%	34.8%
Other essential workers (unable to WAH)	49,185,654	135,454,471	19.8%	54.6%
Increased risk of severe COVID-19	55,973,556	191,428,027	22.6%	77.2%
Other essential workers (able to WAH)	15,863,236	207,291,264	6.4%	83.6%
Other workers	18,777,367	226,068,631	7.6%	91.2%
Other adults	21,936,351	248,004,982	8.8%	100.0%
<i>Standard Errors</i>				
Health workers	549,685	549,685	0.2%	0.2%
Age 75+	693,555	950,796	0.2%	0.3%
Age 65–74	744,929	1,516,703	0.2%	0.4%
Safety, postal, transportation, utility (unable to WAH)	217,392	1,588,894	0.1%	0.4%
Food (unable to WAH)	300,492	1,648,873	0.1%	0.3%
School workers	334,689	1,833,178	0.1%	0.4%
Other essential workers (unable to WAH)	1,116,901	2,641,683	0.3%	0.3%
Increased risk of severe COVID-19	1,244,841	3,567,722	0.3%	0.3%
Other essential workers (able to WAH)	543,283	3,836,033	0.2%	0.3%
Other workers	605,733	4,188,007	0.2%	0.2%
Other adults	551,772	4,560,794	0.2%	0.0%

* Estimates for each group exclude adults who are also members of higher-prioritized groups.

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component, 2014–2017, augmented with information on ability to work at home from the American Time Use Survey, 2017. Sample size 95,830.

WAH=work at home

Table 3: COVID-19 Vaccine Priority Groups, Vaccination Scenario #1, by COVID-19 Health Risk, Poverty Level, and Race/Ethnicity, 2014–2017

Risk Groups	Cumulative Percentages of the Population*									
	All Adults	Adults Meeting CDC Guidelines for Increased Risk of Severe COVID-19	Poverty Level				Race and Ethnicity			
			Under 100% FPL	100% to 199% FPL	200% to 399% FPL	400% FPL and over	White, Non-Hispanic	Black, Non-Hispanic	Asian, Non-Hispanic	Hispanic (All Races)
Health workers	6.8%	6.1%	2.8%	5.3%	7.4%	8.2%	6.6%	9.9%	7.9%	5.3%
Age 75+	15.4%	20.1%	11.6%	19.1%	15.9%	14.6%	17.2%	15.5%	13.9%	9.3%
Age 65–74	26.7%	38.7%	19.6%	31.5%	26.5%	27.0%	30.5%	24.8%	22.7%	15.6%
Safety, postal, transportation, utility (unable to WAH)	28.4%	40.2%	19.9%	32.2%	28.3%	29.2%	32.1%	27.4%	23.5%	16.9%
Food (unable to WAH)	31.0%	42.5%	22.1%	35.5%	31.5%	31.4%	34.1%	30.0%	25.9%	22.2%
School workers	34.8%	45.5%	23.1%	37.1%	35.3%	36.7%	38.5%	33.3%	27.9%	24.8%
Other essential workers (unable to WAH)	54.6%	63.0%	32.8%	55.0%	58.9%	57.5%	57.1%	53.1%	43.0%	51.4%
Increased risk of severe COVID-19	77.2%	100.0%	74.8%	80.5%	78.9%	75.4%	79.3%	81.1%	56.2%	73.6%
Other essential workers (able to WAH)	83.6%	100.0%	75.9%	82.8%	83.6%	85.9%	86.0%	84.7%	70.0%	78.2%
Other workers	91.2%	100.0%	81.6%	90.2%	91.9%	93.6%	93.0%	90.3%	82.6%	87.8%
Other adults	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Standard Errors</i>										
Health workers	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.2%	0.5%	0.6%	0.2%
Age 75+	0.3%	0.4%	0.5%	0.5%	0.4%	0.3%	0.3%	0.5%	0.8%	0.3%
Age 65–74	0.4%	0.5%	0.6%	0.6%	0.5%	0.5%	0.5%	0.6%	1.1%	0.4%
Safety, postal, transportation, utility (unable to WAH)	0.4%	0.5%	0.6%	0.6%	0.5%	0.5%	0.5%	0.7%	1.1%	0.5%
Food (unable to WAH)	0.3%	0.5%	0.7%	0.7%	0.5%	0.5%	0.5%	0.7%	1.2%	0.7%

Risk Groups	Cumulative Percentages of the Population*									
	All Adults	Adults Meeting CDC Guidelines for Increased Risk of Severe COVID-19	Poverty Level				Race and Ethnicity			
			Under 100% FPL	100% to 199% FPL	200% to 399% FPL	400% FPL and over	White, Non-Hispanic	Black, Non-Hispanic	Asian, Non-Hispanic	Hispanic (All Races)
<i>School workers</i>	0.4%	0.5%	0.7%	0.7%	0.5%	0.5%	0.5%	0.7%	1.2%	0.7%
<i>Other essential workers (unable to WAH)</i>	0.3%	0.4%	0.7%	0.6%	0.5%	0.5%	0.5%	0.7%	1.3%	0.7%
<i>Increased risk of severe COVID-19</i>	0.3%	0.0%	0.6%	0.5%	0.4%	0.5%	0.4%	0.6%	1.2%	0.5%
<i>Other essential workers (able to WAH)</i>	0.3%	0.0%	0.5%	0.5%	0.4%	0.3%	0.3%	0.5%	1.0%	0.5%
<i>Other workers</i>	0.2%	0.0%	0.5%	0.3%	0.2%	0.2%	0.2%	0.4%	0.8%	0.3%
<i>Other adults</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

* Estimates for each group exclude adults who are also members of higher-prioritized groups.

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component, 2014–2017, augmented with information on ability to work at home from the American Time Use Survey, 2017. Sample size 95,830.

WAH=work at home, CDC=The Centers for Disease Control and Prevention

Table 4: COVID-19 Vaccine Priority Groups with Higher Priority Given to Adults with COVID-19 Health Risks, Vaccination Scenario #2, 2014–2017

Risk Group	Hierarchical Estimates*			
	Population	Cumulative Population	Percentage of Population	Cumulative Percentage of Population
Health workers	16,962,321	16,962,321	6.8%	6.8%
Age 75+	21,172,355	38,134,676	8.5%	15.4%
Age 65–74	28,196,497	66,331,173	11.4%	26.7%
Increased risk of severe COVID-19	92,675,235	159,006,407	37.4%	64.1%
Safety, postal, transportation, utility (unable to WAH)	1,867,228	160,873,635	0.8%	64.9%
Food (unable to WAH)	3,047,933	163,921,568	1.2%	66.1%
Other essential workers (unable to WAH)	22,723,367	186,644,935	9.2%	75.3%
School workers	4,783,092	191,428,027	1.9%	77.2%
Other essential workers (able to WAH)	15,863,236	207,291,263	6.4%	83.6%
Other workers	18,777,367	226,068,630	7.6%	91.2%
Other adults	21,936,351	248,004,981	8.8%	100.0%
<i>Standard Errors</i>				
Health workers	549,685	549,685	0.2%	0.2%
Age 75+	693,555	950,796	0.2%	0.3%
Age 65–74	744,929	1,516,703	0.2%	0.4%
Increased risk of severe COVID-19	1,898,864	3,076,116	0.4%	0.4%
Safety, postal, transportation, utility (unable to WAH)	120,956	3,100,502	0.0%	0.4%
Food (unable to WAH)	192,742	3,107,046	0.1%	0.4%
Other essential workers (unable to WAH)	583,820	3,465,525	0.2%	0.3%
School workers	232,833	3,567,722	0.1%	0.3%
Other essential workers (able to WAH)	543,283	3,836,033	0.2%	0.3%
Other workers	605,733	4,188,007	0.2%	0.2%
Other adults	551,772	4,560,794	0.2%	0.0%

* Estimates for each group exclude adults who are also members of higher-prioritized groups.

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component, 2014–2017, augmented with information on ability to work at home from the American Time Use Survey, 2017. Sample size 95,830.

WAH=work at home

Table 5: COVID-19 Vaccine Priority Groups with Higher Priority Given to Adults with COVID-19 Health Risks, Vaccination Scenario #2, by Increased Risk, Poverty Level, and Race/Ethnicity, 2014–2017

Risk Groups	Cumulative Percentages of the Population*										
	All Adults	Essential workers not able to WAH	Adults Meeting CDC Guidelines for Increased Risk of Severe COVID-19	Poverty Level				Race and Ethnicity			
				Under 100% FPL	100%–199% FPL	200%–399% FPL	400% FPL and over	White, Non-Hispanic	Black, Non-Hispanic	Asian, Non-Hispanic	Hispanic (All Races)
Health workers	6.8%	12.4%	6.1%	2.8%	5.3%	7.4%	8.2%	6.6%	9.9%	7.9%	5.3%
Age 75+	15.4%	13.3%	20.1%	11.6%	19.1%	15.9%	14.6%	17.2%	15.5%	13.9%	9.3%
Age 65–74	26.7%	17.5%	38.7%	19.6%	31.5%	26.5%	27.0%	30.5%	24.8%	22.7%	15.6%
Increased risk of severe COVID-19	64.1%	61.3%	100.0%	69.0%	69.5%	64.3%	60.5%	67.1%	70.5%	42.6%	54.7%
Safety, postal, transportation, utility (unable to WAH)	64.9%	63.5%	100.0%	69.2%	69.8%	65.2%	61.5%	67.9%	71.6%	43.0%	55.3%
Food (unable to WAH)	66.1%	67.2%	100.0%	70.2%	71.4%	66.6%	62.6%	68.8%	72.6%	44.6%	58.1%
Other essential workers (unable to WAH)	75.3%	94.3%	100.0%	74.3%	79.7%	77.0%	72.6%	77.0%	80.0%	54.8%	72.2%
School workers	77.2%	100.0%	100.0%	74.8%	80.5%	78.9%	75.4%	79.3%	81.1%	56.2%	73.6%
Other essential workers (able to WAH)	83.6%	100.0%	100.0%	75.9%	82.8%	83.6%	85.9%	86.0%	84.7%	70.0%	78.2%
Other workers	91.2%	100.0%	100.0%	81.6%	90.2%	91.9%	93.6%	93.0%	90.3%	82.6%	87.8%
Other adults	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Standard Errors</i>											
<i>Health workers</i>	<i>0.2%</i>	<i>0.3%</i>	<i>0.2%</i>	<i>0.2%</i>	<i>0.2%</i>	<i>0.3%</i>	<i>0.3%</i>	<i>0.2%</i>	<i>0.5%</i>	<i>0.6%</i>	<i>0.2%</i>
<i>Age 75+</i>	<i>0.3%</i>	<i>0.3%</i>	<i>0.4%</i>	<i>0.5%</i>	<i>0.5%</i>	<i>0.4%</i>	<i>0.3%</i>	<i>0.3%</i>	<i>0.5%</i>	<i>0.8%</i>	<i>0.3%</i>
<i>Age 65–74</i>	<i>0.4%</i>	<i>0.4%</i>	<i>0.5%</i>	<i>0.6%</i>	<i>0.6%</i>	<i>0.5%</i>	<i>0.5%</i>	<i>0.5%</i>	<i>0.6%</i>	<i>1.1%</i>	<i>0.4%</i>
<i>Increased risk of severe COVID-19</i>	<i>0.4%</i>	<i>0.5%</i>	<i>0.0%</i>	<i>0.6%</i>	<i>0.6%</i>	<i>0.6%</i>	<i>0.6%</i>	<i>0.5%</i>	<i>0.8%</i>	<i>1.2%</i>	<i>0.6%</i>

Risk Groups	Cumulative Percentages of the Population*										
	All Adults	Essential workers not able to WAH	Adults Meeting CDC Guidelines for Increased Risk of Severe COVID-19	Poverty Level				Race and Ethnicity			
				Under 100% FPL	100%–199% FPL	200%–399% FPL	400% FPL and over	White, Non-Hispanic	Black, Non-Hispanic	Asian, Non-Hispanic	Hispanic (All Races)
<i>Safety, postal, transportation, utility (unable to WAH)</i>	0.4%	0.5%	0.0%	0.6%	0.6%	0.6%	0.6%	0.5%	0.8%	1.2%	0.6%
<i>Food (unable to WAH)</i>	0.4%	0.5%	0.0%	0.6%	0.6%	0.5%	0.6%	0.5%	0.8%	1.2%	0.6%
<i>Other essential workers (unable to WAH)</i>	0.3%	0.2%	0.0%	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%	1.2%	0.6%
<i>School workers</i>	0.3%	0.0%	0.0%	0.6%	0.5%	0.4%	0.5%	0.4%	0.6%	1.2%	0.5%
<i>Other essential workers (able to WAH)</i>	0.3%	0.0%	0.0%	0.5%	0.5%	0.4%	0.3%	0.3%	0.5%	1.0%	0.5%
<i>Other workers</i>	0.2%	0.0%	0.0%	0.5%	0.3%	0.2%	0.2%	0.2%	0.4%	0.8%	0.3%
<i>Other adults</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

* Estimates for each group exclude adults who are also members of higher-prioritized groups.

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component, 2014–2017, augmented with information on ability to work at home from the American Time Use Survey, 2017. Sample size 95,830. Boldface numbers indicates estimates for priority group that contains the median of the overall adult population.

WAH=work at home, FPL=Federal Poverty Line, CDC=The Centers for Disease Control and Prevention

Table 6: COVID-19 Vaccine Priority Groups Based Mainly on Age, Vaccination Scenario #3, 2014–2017

Group	Hierarchical Estimates*			
	Population	Cumulative Population	Percentage of Population	Cumulative Percentage of Population
Healthcare Workers	16,962,321	16,962,321	6.8%	6.8%
Age 75+	21,172,355	38,134,676	8.5%	15.4%
Age 65–74	28,196,497	66,331,173	11.4%	26.7%
Age 55–64	38,148,381	104,479,553	15.4%	42.1%
Age 45–54	39,049,466	143,529,020	15.7%	57.9%
Age 35–44	36,320,508	179,849,528	14.6%	72.5%
Age 18–34	68,155,454	248,004,982	27.5%	100.0%
<i>Standard Errors</i>				
Healthcare workers	549,685	549,685	0.2%	0.2%
Age 75+	693,555	950,796	0.2%	0.3%
Age 65–74	744,929	1,516,703	0.2%	0.4%
Age 55–64	959,797	2,214,083	0.3%	0.4%
Age 45–54	869,496	2,783,321	0.2%	0.4%
Age 35–44	954,472	3,359,628	0.3%	0.3%
Age 18–34	1,559,415	4,560,794	0.3%	0.0%

* Estimates for each group exclude adults who are also members of higher-prioritized groups.

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component, 2014–2017, augmented with information on ability to work at home from the American Time Use Survey, 2017. Sample size 95,830.

Table 7: COVID-19 Vaccine Priority Groups Based Mainly on Age, Vaccination Scenario #3, by COVID-19 Health Risk, Employment, Poverty, and Race/Ethnicity, 2014–2017

Health/Age	Cumulative Percentages of the Population*										
	All adults	Adults Meeting CDC Guidelines for Increased Risk of Severe COVID-19	Essential workers not able to WAH	Poverty Level				Race and Ethnicity			
				Under 100% FPL	100% to 199% FPL	200% to 399% FPL	400% FPL and Over	White, Non-Hispanic	Black, Non-Hispanic	Asian, Non-Hispanic	Hispanic (All Races)
Healthcare workers	6.8%	6.1%	12.4%	2.8%	5.3%	7.4%	8.2%	6.6%	9.9%	7.9%	5.3%
Age 75+	15.4%	20.1%	13.3%	11.6%	19.1%	15.9%	14.6%	17.2%	15.5%	13.9%	9.3%
Age 65–74	26.7%	38.7%	17.5%	19.6%	31.5%	26.5%	27.0%	30.5%	24.8%	22.7%	15.6%
Age 55–64	42.1%	56.0%	33.3%	34.1%	44.2%	39.5%	45.2%	47.6%	39.4%	34.5%	26.2%
Age 45–54	57.9%	71.2%	54.0%	48.6%	56.5%	54.3%	63.3%	63.3%	54.8%	50.8%	42.6%
Age 35–44	72.5%	83.4%	73.1%	64.0%	70.2%	69.7%	77.6%	76.3%	69.2%	68.6%	62.5%
Age 18–34	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Standard Errors</i>											
<i>Healthcare workers</i>	0.2%	0.2%	0.3%	0.2%	0.2%	0.3%	0.3%	0.2%	0.5%	0.6%	0.2%
<i>Age 75+</i>	0.3%	0.4%	0.3%	0.5%	0.5%	0.4%	0.3%	0.3%	0.5%	0.8%	0.3%
<i>Age 65–74</i>	0.4%	0.5%	0.4%	0.6%	0.6%	0.5%	0.5%	0.5%	0.6%	1.1%	0.4%
<i>Age 55–64</i>	0.4%	0.5%	0.5%	0.8%	0.7%	0.5%	0.7%	0.6%	0.7%	1.4%	0.6%
<i>Age 45–54</i>	0.4%	0.5%	0.5%	0.8%	0.7%	0.6%	0.6%	0.6%	0.6%	1.5%	0.6%
<i>Age 35–44</i>	0.3%	0.3%	0.4%	0.8%	0.6%	0.5%	0.5%	0.5%	0.5%	1.2%	0.5%
<i>Age 18–34</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

* Estimates for each group exclude adults who are also members of higher-prioritized groups.

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component, 2014–2017, augmented with information on ability to work at home from the American Time Use Survey, 2017. Sample size 95,830. Boldface numbers indicates estimates for priority group that contains the median of the overall adult population.

WAH=work at home, FPL=Federal Poverty Line, CDC=The Centers for Disease Control and Prevention