

Baltimore City COVID-19 Vaccination Strategy

Executive Summary

The Centers for Disease Control and Prevention (CDC) estimates that COVID-19 has caused 23,440,774 infections¹ nationally. In Baltimore City, there have been 35,773 total cases and 698 deaths² as of January 18, 2021.³ Within communities of color, the disease has reflected long-standing health disparities, with 49.5 cases per 1,000 individuals for the African American community compared to 38.4 cases per 1,000 for white individuals; and 113.3 cases per 1,000 for the Latinx community, compared to 50.4 cases per 1,000 for the Not Latinx community.⁴

Vaccination is a critical tool to end the pandemic. Success will require vaccination of at least 80% of the 593,490 residents of Baltimore City or 474,792 residents.⁵ Baltimore City can achieve this by following a fair, clear, and organized approach. Much will be expected of City agencies, residents, businesses, and other professionals to reach this goal. Baltimore City is committed to supporting President Biden's plan to vaccinate 150,000,000 people in his first 100 days in office by immunizing 135,000 residents in the City by April 30, 2021.

To this end, the Baltimore City Health Department (BCHD) has developed a multifaceted strategy to vaccinate Baltimore City residents against COVID-19. This plan will be implemented in partnership with our federal and state counterparts. Baltimore City will support the federal and state government with mass vaccination campaigns. The City will lead a focused mobile response to special populations who either cannot or will not be able to access mass vaccination sites. Many in these special populations have suffered disproportionately in this pandemic and should be prioritized locally and attended to in a strategic and supportive manner. All partners will be expected to publicly share where and when they are vaccinating residents so resources are used optimally.

The availability of a vaccine does not reduce the need to continue following public health recommendations such as wearing masks and social distancing, as it is still unknown if vaccination reduces or prevents viral transmission. We also need to maintain our optimism as we look forward to Ravens and Orioles games, buying crabs at our famous markets, reopening our public schools, and the many other cultural and athletic events we have foregone during the pandemic.

We ask you as our partners and residents living or working in Baltimore City to activate your allies, participate as individuals, and help us mobilize for success in whatever way you can so we together can achieve these crucial goals.

Vision: COVID-19 vaccination

We will achieve population immunity through vaccination, supported by residents, community organizations, and businesses.

¹ https://covid.cdc.gov/covid-data-tracker/#cases_casesper100klast7days

² <https://coronavirus.baltimorecity.gov/>

³ <https://coronavirus.maryland.gov/#Vaccine>

⁴ <https://coronavirus.baltimorecity.gov/>

⁵ US Census American Community Survey 2019 1-year Baltimore City population estimates

Baltimore City Health Department's Mission

To protect health, eliminate disparities, and enhance the wellbeing of everyone in our community through education, coordination, advocacy, and direct service delivery.

Goals: COVID-19 Vaccination

1. At least 80% of the population of Baltimore City is vaccinated against COVID-19 by February 2022.
 - Key populations at special risk for COVID-19 (defined below) receive vaccination in an accessible and equitable manner.
2. Reduce COVID-19 vaccine hesitancy amongst City residents with emphasis on populations that have been disproportionately impacted by COVID-19 to <20% by providing accurate and transparent health information to address questions and concerns from Baltimoreans regarding the COVID-19 vaccine.

While BCHD does not have authority over the number of vaccines available for distribution and will rely on state and federal allocations, the City will adopt the following programmatic fundamentals for our efforts:

- All engaged partners should recognize the history of racism in Baltimore City, ongoing injustices within the healthcare system, and other issues (e.g., food insecurity, financial difficulties, safety concerns, health conditions) that may contribute to vaccine hesitancy among residents. It is imperative that we listen to, communicate transparently with, and build trust with community residents at every step of this plan.
- Partnership is indispensable. Each level of government (federal, state, and local) has a significant role in vaccine distribution as do all local private and academic partners.
- Partners include health systems, faith-based leaders, community-based organizations, City schools, libraries, recreation and park sites, and local businesses.
- It is imperative that we communicate transparently to optimize resources.
- Monitoring uptake of vaccination geographically and by race, ethnicity, and age is essential. Understanding who has received the vaccine will drive education and communication efforts.
- Reducing barriers to accessing the vaccine is vital. Populations at special risk for COVID-19 disease, such as residents of nursing homes, assisted living facilities, and senior housing; African Americans; Latinx; the Hasidic community; uninsured individuals; pregnant women; young men; people with disabilities; people experiencing homelessness; and others should have easy access to the vaccine via trusted providers.
- Leaders of underserved populations must be engaged to provide input into distribution plans and develop and implement strategies that reach the maximum number of people.
- Building trust must be a priority, through regularly engaging and briefing trusted messengers, including community leaders and organizations, resident service coordinators, faith leaders, and others.
- For deploying the vaccine, partners need to be organized geographically through a variety of point of dispensing (POD) models (mass vaccination site, standard clinic, drive-through, mobile clinic, strike or "response" team, standard health care models).
- Once vaccine supply increases, the burden of administering the vaccine will be shared among all healthcare partners.
- Education and mobilization of City residents is paramount to success. All means of reaching residents must be tapped into so that everyone understands the value and safety of the COVID-19 vaccine and the essential need to achieve population immunity

for recovery. Particular priority will be placed on residents who do not have easy internet access or are otherwise underserved.

- City agencies, first responders, and critical infrastructure staff all need to be activated to support efforts in mobilization, education, deployment of the vaccine, and the reopening of critical City services.
- Vaccine availability will initially be severely limited.

Background

The level of vaccine coverage needed to achieve population immunity by vaccination is currently unknown. Published estimates range from 60-80%.⁶ Baltimore City has an estimated 593,490 residents.⁷ To achieve 80% coverage, we will need to vaccinate an estimated 474,792 residents. This must occur in all communities, particularly in communities of color who often have a higher proportion of essential frontline workers and face disparities in underlying health placing these communities at higher risk of both transmission and health impact. Population immunity is dependent on multiple factors, including the basic reproductive rate of the virus and average duration of immunity after vaccination. Deciding to use the upper figure of 80% is aspirational, considering the scientific unknowns and national estimates of moderate to high COVID-19 vaccine hesitancy. BCHD strives to meet this goal by February 2022, understanding the limitations and rapidly evolving science and public sentiment.

COVID-19 severely threatens everyone. However, the most vulnerable populations are at greatest risk for severe adverse outcomes. Many circumstances contribute to the potential for more widespread severe illness, including the fact that approximately one in five residents lives in poverty, 21% of households do not have Internet access; and 6.2% of residents have no health insurance.^{8,9} In addition, the City's population is approximately 60% African-American, raising heightened alarm because of the known disproportionate impact that COVID-19 is having on communities of color, from health, economic, and social perspectives.^{10,11,12} Overall, residents in the City have a high prevalence of chronic conditions such as diabetes, obesity, and asthma¹³ resulting from decades of structural racism and neglect of many city neighborhoods.¹⁴ This strategy is citywide, and BCHD will engage partners for the high volume interventions, with an emphasis on meeting the needs of African American residents. BCHD will simultaneously focus special attention on sub-populations that are most vulnerable to COVID-19 or that require specialized outreach and education. These sub-populations range in size: over 125,000 residents 60 years of age or older (14,000 in senior housing facilities, 3,600 in nursing homes, and 2,900 in assisted living facilities); 13,300 pregnant and lactating women; 26,755 young men between the ages of 18-24; 33,652 Latinx residents; an estimated 2,193 persons

⁶ [https://www.thelancet.com/article/S0140-6736\(20\)32318-7/fulltext](https://www.thelancet.com/article/S0140-6736(20)32318-7/fulltext)

⁷ <https://www.census.gov/quickfacts/fact/table/baltimorecitymarylandcounty/AGE295219>

⁸ US Census American Community Survey 2019 1-year estimates

US Census American Community Survey 2019 5-year Baltimore City characteristics of uninsured estimate

¹⁰ Yancy CW: COVID-19 and African Americans. *JAMA*. 2020;323(19):1891–1892. doi:10.1001/jama.2020.6548

¹¹ <https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html#fn2>

¹² Yancy CW. COVID-19 and African Americans. *JAMA*. 2020;323(19):1891–1892. doi:10.1001/jama.2020.6548

¹³ 500 Cities: Local Data for Better Health, 2019 release. <https://chronicdata.cdc.gov/500-Cities/500-Cities-Local-Data-for-Better-Health-2019-relea/6vp6-wxug/data>

¹⁴ Johns Hopkins Urban Health Institute. Race, Racism, and Baltimore's Future: A Focus on Structural and Institutional Racism. https://urbanhealth.jhu.edu/what-we-do/social-determinants-health-symposium/2016/SDH_2016_Summary_Report.pdf 2016. Accessed 17 August 2020.

who are experiencing homelessness (counted in January 2020); and 96,445 residents with disabilities.^{15,16}

Some of barriers recognized by the CDC for adult vaccination include:

1. Limited access to health care, including lack of transportation and limited health literacy
2. Multiple competing priorities for providers who care for adult patients
3. Low awareness among adults about recommended vaccines and their benefits
4. Challenges in coordinating care for adults who often have more than one medical provider
5. A complicated adult immunization schedule
6. Unanticipated costs
7. Lower access to and use of digital means of communication

In communities of color, concerns related to structural racism can run deep; and while these communities are by no means monolithic, a significant portion of the community simply lacks trust in the health care system and requires a different level of engagement.

Lessons Learned from 2020 Flu Vaccination Campaign

Because COVID-19 is a new disease, we need to learn from experiences with other infectious diseases. In August 2020, BCHD led a citywide flu vaccination campaign to “prepare” for the COVID-19 vaccination. We are using the data from that campaign to provide us with a baseline and a geographic approach for mobilization and ultimately deployment of the COVID-19 vaccine. Detailed recommendations from the 2020-2021 citywide flu vaccination initiative are found in Appendix 1.

The flu vaccine effort revealed the multiple challenges to achieving population immunity to infectious disease. Even after a robust communication campaign, only 20.5% of the City’s population has received a flu vaccine as of January 4, 2021, according to the flawed, but the only existing, immunization registry, ImmuNet. Even in the high-risk category of older adults, coverage rates hovered at 28.5% at the end of 2020. This was well below the 70% goal but was a 13% increase in flu shots administered compared with the same point last year. This 13% increase is slightly above the 2.6% national increase in flu shots compared with last year, according to the CDC.^{17,18} The City and partners worked together to bring flu clinics to the most vulnerable communities and engage trusted individuals within their community. A survey of residents living in senior housing buildings revealed higher rates of flu vaccine coverage (>80% based on unadjusted data). After adjustment for non-response, estimates ranged from 40-60%. See Appendix 2: Evaluation of Baltimore City Health Department Flu Vaccine Initiative in Senior Housing Buildings.

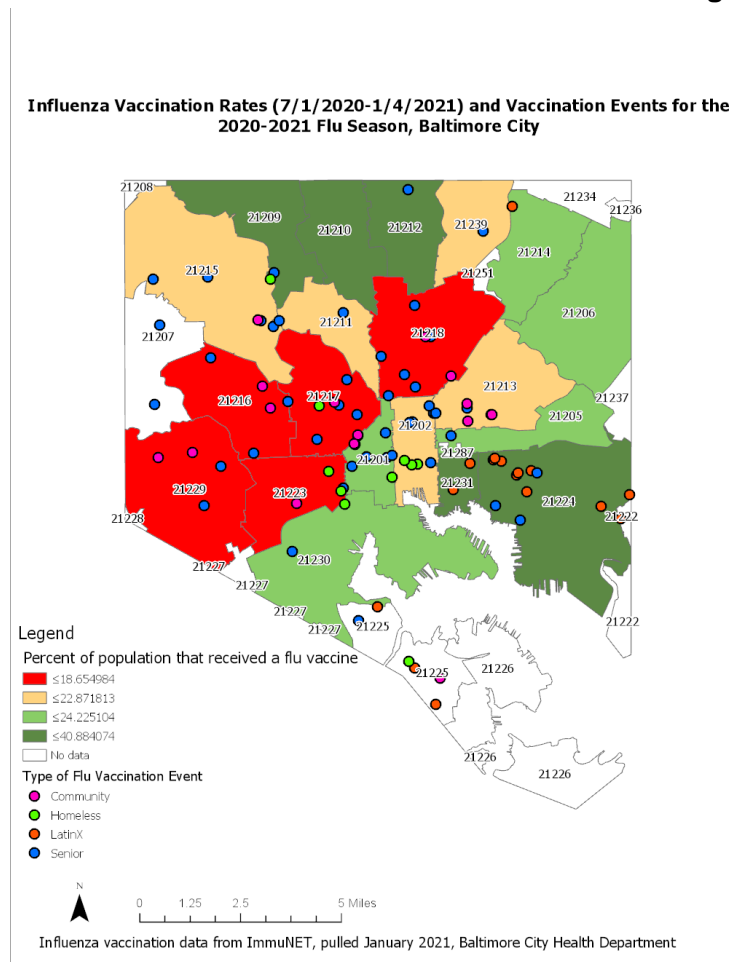
Figure 1 indicates where BCHD held vaccination events and coverage. While the full health system had access to the vaccine, there was considerable vaccine hesitancy, which points to a significant need to invest in communication and education about the COVID-19 vaccine immediately.

¹⁵ Mayor’s Office of Homeless Services. Baltimore City 2020 Point-in-Time Count. June 1, 2020. https://homeless.baltimorecity.gov/sites/default/files/Full_Preliminary%20Report%5B1%5D.pdf Accessed 17 August 2020.

¹⁶ US Census American Community Survey 2019 1-Year Estimates

¹⁷ <https://www.cdc.gov/flu/fluview/reportshtml/reporti1819/reporti/index.html>

¹⁸ <https://www.cdc.gov/flu/fluview/reportshtml/reporti1920/reporti/index.html>

Figure 1: 2020 BCHD Seasonal Flu Vaccination Events and Coverage Rates

More detailed data from ImmuNet show that as of January 4, 2021, vaccination coverage in Baltimore City was 22% for females and 18.2% for males. Among older adults (60+), 60% of those vaccinated were female and 40% were male. For older adults (60+) vaccinated through January 4, 2021, 50% were African American, 25% were white, and 1% were Asian, and 26% of race data were other or missing. Additionally, 1% were Hispanic and 69% were not Hispanic, and 30% of ethnicity data were missing. This is compared with City census data that shows that the residents are 61.7% African American, 30.4% white, and 5.5% Latinx.¹⁹ The gender imbalance is particularly important, as a higher percentage of men have severe outcomes from COVID-19 compared with women, and they are also more likely to support others economically.^{20,21}

People in communities of color, including younger age groups, are also more likely to hold frontline jobs, putting them at higher risk. They are also commonly working in the healthcare profession and therefore have influence on the vaccine decisions of a broad range of people, particularly those who are vaccine-hesitant.

¹⁹ Survey/Program: American Community Survey (ACS); Table ID: DP05; Product: 2018: ACS 1-Year ACS Demographic and Housing Estimates

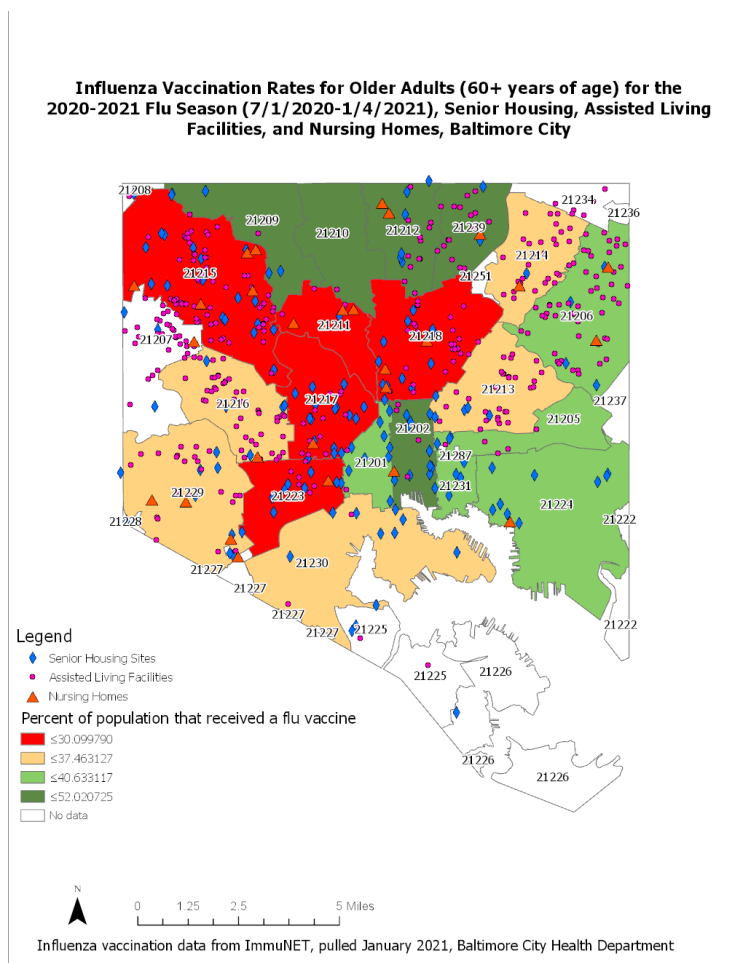
²⁰ [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30117-X/fulltext?utm_source=mp-fotoscapes](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30117-X/fulltext?utm_source=mp-fotoscapes)

²¹ <https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1008570>

BCHD has detailed maps by age and race for flu vaccination, and these will be used to inform how we educate about and deploy the COVID-19 vaccine. These maps identify faith-based institutions, food distribution sites, schools, and other key organizations that can provide strategic direction for the many working groups on the COVID-19 vaccination initiative.

Given the low historic coverage of flu vaccination in older adults (see Figure 2, which shows coverage for those 60 or older for the 2020-2021 flu season), the state and the City have worked together with CVS, Walgreens, Shop Rite, and Rite Aid pharmacies to implement a targeted strategy for that population. A survey of older adults revealed that pharmacies accounted for approximately 40% of all flu vaccinations and were an important source of information, behind only that of physicians' offices. Further work, however, is needed to explore the level of trust in pharmacists, particularly when it comes to COVID-19 vaccines. Pharmacists may also offer another opportunity to customize messaging based on each resident's underlying health conditions, a significant concern of older adults.

Figure 2: Influenza Vaccination Coverage Rates for Older Adults (60+), Nursing Homes, Assisted Living Facilities, and Senior Housing



In addition to understanding who received the vaccine during the flu initiative, it is helpful to know which providers offered flu vaccination. Table 1 below shows the breakdown by provider type identified through ImmuNet for all residents and then for older adult residents. The majority of the population was vaccinated through their primary care doctor or through pharmacies. The majority of the population is getting vaccinated through their primary care doctor or through pharmacies.

Table 1: Flu Vaccinations by Provider Types

All Residents Vaccinated by Provider Type		Older Adults Administered Vaccines by Provider Type	
Provider Type	Pct (%)	Provider Type	Pct (%)
Dialysis Centers	4 %	Dialysis Centers	0.5 %
Hospital	4 %	Hospital	7 %
Local Health Department (LHD)	2 %	Local Health Department (LHD)	0.3 %
Pharmacy	55 %	Pharmacy	41 %
PMD / Clinics	35 %	PMD / Clinics	52 %
Urgent Care	0 %	Urgent Care	0 %

Vaccines

The current supply of COVID-19 vaccine is extremely limited as only two manufacturers have obtained an Emergency Use Authorization (EUA) from the Food and Drug Administration (FDA) for use in the United States as of the writing of this plan. While both vaccines in use are **mRNA** vaccines, future vaccines may employ **viral vectors** or include **recombinant protein-based** vaccines. At this time, all COVID-19 vaccines are free of charge although insurance companies may charge an administration fee.²²

mRNA COVID-19 Vaccines

mRNA vaccines contain genetic material that instructs the body's cells to make a harmless spike protein which then prompts the body to produce antibodies against the SARS-CoV-2 virus. The vaccine does not contain the SARS-CoV-2 virus and cannot cause COVID-19. Once the body produces this protein, it will recognize that the protein does not belong there and will mount an immune response to destroy it. The body remembers the threat, and the immune response will then be triggered if the individual is exposed to COVID-19 in the future.

- Pfizer COVID-19 Vaccine can be used in individuals age 16 and older (as of 1/18/21)
- Moderna COVID-19 Vaccine can be used in individuals age 18 and older (as of 1/18/21)
- Clinical studies are ongoing in younger children

Viral Vector COVID-19 Vaccine

These vaccines contain a different weakened but live virus. Inside the virus is genetic material from the virus that causes COVID-19. Once the viral vector is injected into someone, that genetic material tells the body how to make the protein that is found in COVID-19. Once the cells do so, the body will recognize the protein is not supposed to be there and will build an immune response to remove the proteins and help against a future COVID-19 infection.

Recombinant protein-based vaccines:

²² EUA fact sheets and https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/how-they-work.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fvaccines%2Fabout-vaccines%2Fhow-they-work.html.

These vaccines are based on a part of the virus (e.g., spike-protein). They also contain an adjuvant to enhance immune response. The Novavax vaccine entered Phase 3 trials in the US and Mexico at the end of December. Sanofi-GSK's trial was delayed in December 2020 to improve immune response in the elderly.

Strategy

This COVID-19 vaccination strategy calls for an immediate and aggressive citywide response to offer and provide COVID-19 vaccinations. Healthcare partners, neighborhood, community- and faith-based organizations, and public and private partners all play a role in sharing data and getting vaccines into the arms of our residents. Clinical partners such as hospitals, urgent care facilities, federally qualified health centers, and primary care offices are expected to play major roles in COVID-19 vaccination. Community-based partners, neighborhoods, friends, and families are asked to build trust among residents by educating and dispelling myths and rumors. This will require honest and transparent communication about what we know or do not know.

This strategy is intended to complement the state approach to vaccine access. This document describes which organizations will partner, how to deploy the vaccine, and what needs to be in place to generate demand for and interest in the vaccine. To organize the operations of the initiative, we can divide our efforts into two pyramids that illustrate deployment tactics (supply, Figure 3) and engagement tactics (demand, Figure 4).

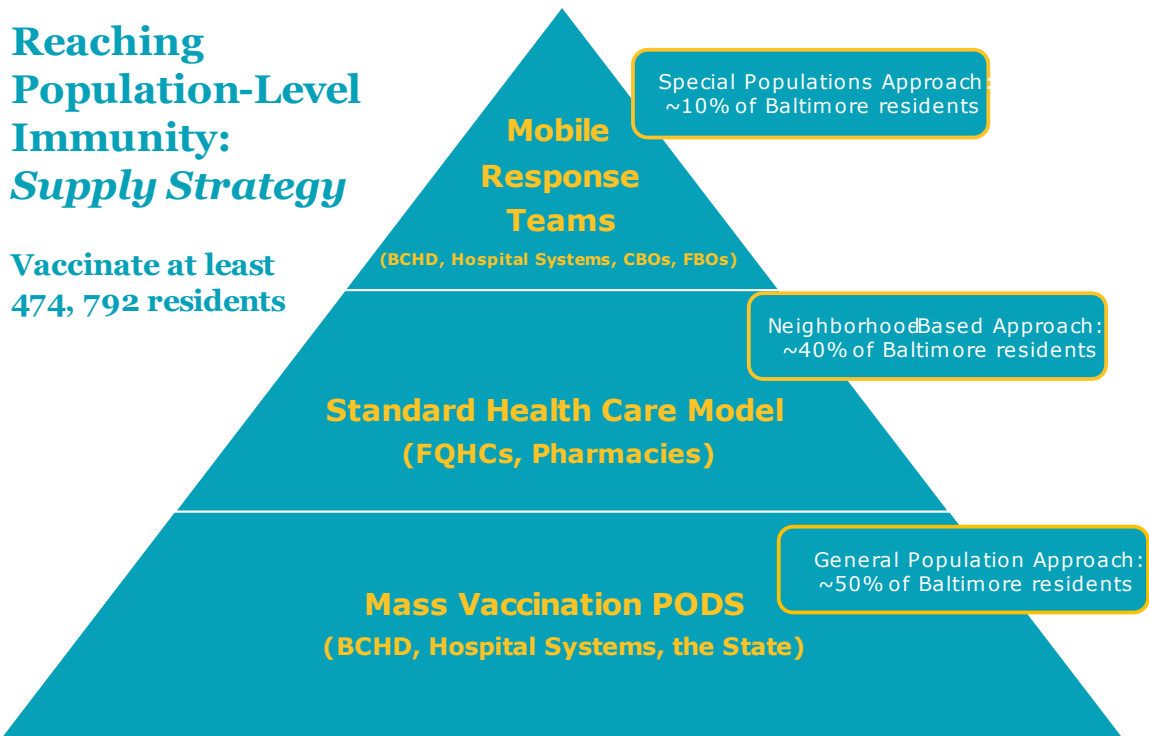
As we execute this strategy, we recognize that BCHD and the City must work to build trust, especially with residents of color, given the historic and ongoing medical abuse and racism within the health care system that Baltimore City residents and their families have experienced. We also know that that this will take time and concerted effort beyond the length of the COVID-19 pandemic and vaccine strategy. Through this strategy, we will work to ensure that everyone in the City has accurate information about the COVID-19 vaccine so that they can make an informed decision about vaccination with the people they trust. To build trust and provide accurate information, BCHD will communicate with the public through regular town halls and community presentations, its website, and its social media channels, and by making available an email address to which residents can send questions and receive individual responses.

We also commit to working collaboratively with the community to administer the vaccine and execute this strategy. To that end, BCHD is holding a biweekly community engagement meeting for residents to advise and provide feedback on the strategy in real time. We will hold approximately 30 listening sessions facilitated by Morgan State University and the International Vaccine Access Center (IVAC), where community members will be able to ask questions of vaccine experts and directly shape the communications that will go out to the community. We will also compensate community members who wish to be ambassadors for the strategy and educate community residents in populations especially vulnerable to COVID-19.

Supply

The objectives below refer to the supply pyramid in Figure 3.

Figure 3: Approach to Population Access to COVID-19 Vaccination



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When vaccine supply is limited, mass vaccination PODs will be most effective for rapid high-volume vaccine administration. We plan for 50% of the population to be vaccinated through mass vaccination PODs. As supply increases, vaccine administration will shift to a neighborhood-based approach, with the vaccine administered through health centers and pharmacies. Approximately 40% of the population will be vaccinated through this approach. Some sub-populations, approximately 10%, will not be captured through the mass vaccination or neighborhood-based approaches. Mobile response teams will bring vaccine to them.

Objective 1: By February 2022, equitably vaccinate at least 474,792 residents (80%) in Baltimore City and 135,000 by April 30, 2021.

While vaccination in a resident’s medical home (i.e., primary care provider’s office) is ideal so that patients also receive other preventive services and ask questions of a trusted source of information, there are four reasons why this is not a feasible singular strategy:

1. Vaccine supply is extremely limited, and those most at risk for severe morbidity and mortality must be prioritized
2. Storage and handling of vaccines is complex and requires tight controls to ensure doses are not wasted
3. Speed of vaccination is critical – given the rapidity with which this virus can mutate, it is important to move as quickly as possible to reach as many residents as possible to get ahead of disease transmission

4. Some residents may not have a primary care provider due to medical mistrust, lack of insurance, or for some younger residents, a sense of invulnerability

To this end, we have a multilevel response to supplying vaccination at locations outside the traditional medical home to increase rapid access to vaccines. As vaccine supply becomes more available, additional points of access will be added. Regardless of vaccination location, best practices for storage and handling of vaccines and vaccine administration should be followed. All sites providing the vaccine must document information on administered vaccines in ImmuNet within 24 hours as mandated by the Governor's January 5, 2021 Executive Order, so that providers have accurate and timely information on their patients' vaccination status and the City and State have an accurate report of population coverage.^{23, 24}

Sub-objective 1a: Through mass vaccination PODs, vaccinate at least 237,396 residents by February 2022 with an aim to reach 67,500 by April 30, 2021.

Following Figure 3, the base of the pyramid represents using mass vaccination through standard and drive-through clinics as a foundational approach. We will reach the highest number of residents through this tactic. Currently, BCHD is operating one standard point of dispensing clinic, or POD. To properly manage the overarching COVID-19 vaccination initiative, however, BCHD will need to step back from POD management so that the full City is activated in a response. In the next month, therefore, the City aims to expand POD operations from one site to four, in partnership with the State, hospital systems, and community-based organizations. PODs, both standard clinic and drive through, will be geographically spread throughout the City. These PODs will be located in areas with public transportation access. BCHD's role on these PODs will be coordination; they will otherwise be organized and staffed through community partners, along with our major health systems. Ideally these PODs will operate for at least 40 weeks, with a weekly throughput of approximately 10,000 residents. These PODs will offer the vaccine according to the State eligibility plan.

Sub-objective 1b: Using existing hospital and health facilities, vaccinate at least 189,917 residents by February 2022 with an aim to reach 54,000 by April 30, 2021.

The second level of the pyramid supports an approach that uses the existing local health providers. This includes pharmacies, federally qualified health centers (FQHCs), managed care organizations, and our hospital partners. These entities will be tapped into as soon as adequate vaccine supply is available and the State designates such partners as vaccination sites. Some hospitals are equipped with vaccine and can begin to vaccinate. Pharmacies should be linked into large employers to expedite vaccination, where possible.

Sub-objective 1c: Using mobile response teams (standard clinic and door-to-door) vaccinate at least 47,479 residents by February 2022 with an aim to reach 13,500 by April 30, 2021.

The third level of the pyramid represents focused tactics. This effort must be led by BCHD, as it requires an understanding of the local landscape of needs and community-based partners.

²³ <https://governor.maryland.gov/2021/01/05/governor-hogan-announces-statewide-actions-to-accelerate-covid-19-vaccinations-in-maryland/#:~:text=Governor%20Hogan%20has%20issued%20an,hours%20after%20vaccines%20are%20administered.>

²⁴ Centers for Disease Control and Prevention. Vaccination Guidance During a Pandemic. June 9, 2020 <https://www.cdc.gov/vaccines/pandemic-guidance/index.html> Accessed 17 August 2020.

Team leads are assigned to develop workplans for scheduling response teams that rapidly deploy to vaccinate special sub-populations. Team leads will send response teams to neighborhoods, particularly those with majority African American, immigrant, and older residents. Response teams will focus on vaccinating vulnerable communities that have been disproportionately impacted by the COVID-19 pandemic, including older adults living in nursing homes, assisted living facilities, and senior living facilities; homeless residents in encampment sites, other congregate settings, and on the streets; uninsured residents; and residents with disabilities. There will be at least 10 response teams. BCHD will contract with Rite Aid pharmacy and other health system partners to train and qualify these teams, some of which will then set up vaccination locations at churches, schools, and other sites familiar and easily accessible. Other teams may go door-to-door to residents who are not mobile.

It is imperative that this work is coordinated with what has been assigned to federal pharmacy partners (CVS and Walgreens) to avoid duplication of efforts. To that end, the City must have visibility where federal partners have deployed the vaccine. Best practices from how to set up a mobile clinic and canvas neighborhoods to how to administer the vaccine will be available through the BCHD website. Response teams will be provided with standardized guidelines for response and offered a web-based training. Response teams will be prepared to be called upon by the team leads for each special population as they schedule events. Given the potential scarcity of vaccinators available, residents with appropriate interest and background will be invited to train as vaccinators to produce the workforce needed to support this response. This additional workforce will have the added benefit of being trusted community residents who may be better positioned to address vaccine hesitancy among their peers. Baltimore Health Corps and academic partners, including Baltimore City Community College will be engaged as partners for this effort. In addition, residents, clinicians, and other interested volunteers are asked to sign up for the Maryland Responds Unit (<https://mdresponds.health.maryland.gov/faq.php>), which is being used to help staff various aspects of the COVID-19 response.

Tactics 1c

- Tactic 1: By end January 2021, understand where State Health Department is deploying vaccine in Baltimore City
- Tactic 2 By end January 2021, design the mobile vaccine team training curriculum
- Tactic 3 By February 15, 2021, develop materials for mobile teams, establish the process for qualifying teams, and outline logistics
- Tactic 4 By February 15 2021, set up process for qualifying 10 mobile vaccination teams
- Tactic 5 By the third week in February 2021, special population leads will have identified venues for mobile vaccination teams by prioritizing outreach locations
 - Identify individuals at highest risk (assisted living facilities, senior housing, mixed senior housing, people experiencing homelessness)
 - Identify geographically where there is less access to health services
 - Identify geographically where there is high COVID-19 disease burden
 - Identify locations where clinical and community partners can support
- Tactic 6 By last week in February, implement mobile outreach to vulnerable populations

Partners will be needed at all levels of the supply pyramid and will be assigned as follows:

Base

- BCHD
- City hospitals

- Universities
- State run mass vaccination PODs

Level 2

- BCHD
- Primary care medical providers
- Pharmacies
- Mental health providers
- Managed care providers
- FQHC
- Hospitals

Level 3

- BCHD
- Mobile response teams made up of healthcare providers
- Health Care Access Maryland
- Training partner

Demand

The objectives below refer to the demand pyramid in Figure 4.

Figure 4: Approach to Educating and Mobilizing Residents and Providers to Achieve Population Access to COVID-19 Vaccination



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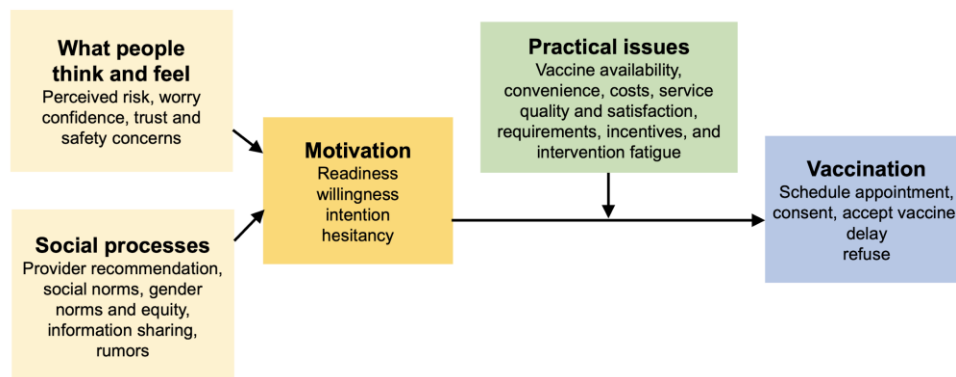


Objective 2: Communicate with and educate 593,490 residents of Baltimore City about the need to vaccinate against COVID-19, how essential it is to achieve herd immunity, where they can receive a COVID-19 vaccine, and what to expect from the vaccine.

BCHD will serve primarily as a facilitator, coordinator, and advocate for City residents to obtain vaccinations via a strong communication and education campaign. The campaign (depicted in Figure 4 above) will be structured on three levels and will require the participation of everyone in the City. In addition to the campaign, call centers are set up including for older adults and individuals with disabilities via the Maryland Access Point line (410 396-CARE); for pregnant and lactating women via Health Care Access Maryland (410 649-0500); for the general resident population 211. These call centers will be staffed with professionals trained in customer relations and in citywide resources. Staff at these centers will be equipped with scripts and information to direct residents and providers to the correct venues for vaccination as well as connect residents to other essential needs they may have. Call center staff will be trained so that responses are standardized and effective.

The communication and education campaign staff and staff lead for vulnerable community groups will use the Increasing Vaccination Model developed by an expert working group supported by the World Health Organization to increase vaccine demand.²⁵ The model reflects the social and behavioral drivers of immunization as well as practical issues including supply availability, convenience, costs, service quality and satisfaction, incentives, and intervention fatigue. Each team lead for vulnerable communities will develop their workplan and scheduling of mobile responses considering factors highlighted in Figure 5. It is important to recognize the importance of trusted messengers and the need for multiple actions over a period of time. This model is the basis for sustainability and cannot be achieved through one-time actions. This needs to be part of the emergency response as well as ongoing “building back better” of both primary care and routine immunization systems for adults.

Figure 5: Model for Achieving Population Immunity
Increasing Vaccination Model



Source: The BeSD expert working group. Based on: Brewer NT, Chapman GB, Rothman AJ, Leask J, and Kempe A (2017). Increasing vaccination: Putting psychological science into action. *Psychological Science for the Public Interest*. 18(3): 149-207

Sub-Objective 2a: Develop and disseminate through February 2022 a mass media campaign to reach the general population, the provider population, and special populations.

²⁵ https://www.who.int/immunization/programmes_systems/Increasing_Vaccination_Model-WHO.PDF?ua=1

BCHD, in partnership with the City Joint Information Center, is now hosting a community engagement committee that is being used to quickly develop effective messages about:

1. What the COVID-19 vaccination is and why you need it
2. Where you can be vaccinated
3. Where you can get questions answered
4. What side effects may occur
5. How residents and healthcare providers can become involved

This campaign will be complemented by a more thorough education campaign that will be described in detail under the specialty populations sub-objective. This mass communication campaign will build on materials that were developed for vaccine research through the HIV Vaccine Trials Network and the COVID-19 Prevention Network and will adapt whatever additional federal and state campaigns are forthcoming. Messages will be shared through television, radio, bus ads, billboards, mass texting, and any other means that can reach populations. The campaign will be responsive to the needs of African American residents and benefit from consultation from the NAACP in its development and implementation.

- Tactic 1: Launch and hold community engagement sub-group for mass communication
- Tactic 2: Create culturally-appropriate employee messaging for City agencies using social and other media on the importance of vaccination, COVID-19 prevention messaging, and advertisement of COVID-19 vaccination locations
- Tactic 2: Create culturally-appropriate public messaging using social and other media on the importance of vaccination, COVID-19 prevention, and COVID-19 vaccination locations to increase demand for vaccinations and reduce vaccine hesitancy
- Tactic 4: Implement a faith-based outreach campaign
- Tactic 3: Support education campaign with messaging targeted to vulnerable populations

Sub-Objective 2b: Develop and disseminate through February 2022 a provider education campaign to reach all providers, including pediatricians, obstetricians, internal medicine physicians, pharmacists, nurses, social workers, and city agency providers.

BCHD will have a provider education team lead who will organize messaging developed by the Joint Information Center (JIC) to support what will be most useful to the variety of providers. Providers will be broadly defined to include providers outside of the health system. The purpose of this campaign will be to equip providers with the means to direct residents to vaccination sites and to answer other basic questions with standardized job aids. BCHD will organize sub-task forces from the umbrella COVID-19 task force to listen to and understand provider needs. Materials will include posters, job aids, flyers, and recorded messages from the Commissioner of Health and the Chief Medical Officer. The provider outreach will be built from the provider outreach strategy used by the *B'more for Healthy Babies* initiative.

Sub-Objective 2c: Develop and disseminate through February 2022 a specialty population education campaign to populations most vulnerable to COVID-19, working particularly in African American and immigrant neighborhoods.

Special populations are defined as residents who are 60 years of age or older; pregnant and lactating women; young men between the ages of 18-24; Latinx and immigrant residents; orthodox Jewish residents residing in zip codes of the City with high incidence of COVID-19 disease; homeless persons, and residents with disabilities. These populations do not always

receive information through digital sources and may include hesitant populations. A tailored strategy is needed to engage trusted messengers including resident service coordinators, community health workers (CHWs), ambassadors, and community leaders. Research from the evaluation of the flu initiatives in Baltimore City and additional listening sessions revealed a number of trusted sources that can be leveraged including providers, community leaders, CHWs and more. Partnering with these sources through multiple interactions will be needed to build trust not just for COVID-19 vaccines, but for the government and institutions that help ensure the health of the most vulnerable citizens.

Morgan State University's School of Community Health and The International Vaccine Access Center at Johns Hopkins Bloomberg School of Public Health will work with BCHD leads for each of the vulnerable populations, and develop an education strategy that starts with a citywide listening tour to inform the approach to be taken. Education should be delivered through trusted messengers and community members to ensure that it best meets the needs of the individual.

The education campaign will include listening sessions with vulnerable communities and their ambassadors. This is an opportunity to provide information, listen to the questions from the community, provide honest and accurate answers, and build trusting and transparent relationships. This process can help inform materials and training targeted to the communities' trusted messengers.

We will develop a series of training videos and written materials, including frequently asked questions that provide not only content to help answer questions, but also guidance on techniques to approach people in vulnerable communities that may have very different needs. This will include guidance on how to engage in conversations, particularly if the person may have other priorities, how to recognize the needs of the individual and speak to the community with empathy and respect. Talking to vaccine-hesitant populations will be included in the training and will be informed by the global experience and literature in the US and around the world. The training will also provide guidance on engaging others in the community, including vaccine and public health experts, and will explain the theory of change to help trainees tailor their approach to the community. This campaign will aim to build trust in some of the more challenged neighborhoods in Baltimore City and will help direct where the mobile response teams should set up their clinics or door-to-door approaches. Learnings from the previous flu vaccine initiatives will be incorporated to ensure we meet the needs of the community. This includes messaging that addresses broader needs in addition to protecting against COVID-19. Team leads for the vulnerable populations will convene partners and listen to what are barriers and facilitators for vaccination and where best to situate sites and who best to vaccinate to increase coverage. Data on previously unengaged senior housing populations will be reviewed and outreach strategies will be developed to ensure they are prioritized, including continued direct outreach from BCHD and engagement of community leaders to address gaps.

- Tactic 1: Ensure access to mass communication messages through identification of trusted messengers (give to them same chance to be vaccinated as everyone else in the allocation categories)
- Tactic 2: Listen to the communities and tailor messages to their needs
- Tactic 3: Engage trusted messengers to view the COVID-19 vaccine as an opportunity to address social justice (both social processes and motivation) and bring the trusted messengers into conversation with their communities
- Tactic 4: Develop training for CHWs and ambassadors customized to the needs of communities (incorporate techniques that recognize the framework)

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- Tactic 5: Target others influencing vulnerable populations including younger generations and providers with messaging that speaks to why both they and vulnerable populations should be targeted (considering the motivations)
- Tactic 6: Ensure vaccine availability in the places it is most needed and communicate that the city is deliberate about where it places vaccine to build trust among most vulnerable
- Tactic 7: Communicate role of community to build social norms (e.g. we are all at risk until nearly everyone is vaccinated)
- Tactic 8: Engage leaders

Partners will be needed at all levels of the demand generation pyramid and will generally be assigned as follows:

Base

- BCHD: Communication Office and JIC, media, public results, city government (all city partners for dissemination)

Level 2

- BCHD/JIC
- City Department of Human Resources
- American Academy of Pediatrics - Local Chapter
- American College of Gynecology and Obstetrics -Local Chapter
- MedChi
- Geriatricians
- Pharmacies
- Health Care Access Maryland
- Pediatricians

Level 3

- BCHD: Division of Aging, Maternal and Child Health Bureau, Immunization Program, HIV/STD Services, Chronic Disease Office
- American Association of Retired Persons
- Faith-based institutions and Pastors
- City Schools
- Safe Streets
- Local Businesses
- B'more for Healthy Babies
- Shelters/encampment sites
- Behavioral health providers
- IVAC
- Morgan State University
- HealthCare for the Homeless
- Baltimore Medical System
- Commission on Aging
- NAACP
- National Minority Quality Forum

Monitoring and Evaluation

BCHD's Epidemiology office has assigned a team to this initiative. Already existing is a COVID-19 case and death dashboard that will allow task force members and initiative staff to understand if the strategies put in place are accomplishing our objectives for equitably vaccinating Baltimore's residents. In addition, an entity will be engaged to evaluate the strategy, including cost and sustainability. In addition, the internal COVID-19 team at BCHD will document all lessons learned so that we can be prepared for whatever response is needed in the future that involves vaccination of our population at this scale. Critical to this effort will be addressing immediately the continuing issues with provider and continuous BCHD access to timely and accurate data. Several issues with ImmuNet (Maryland's Immunization Information System) were identified during the flu vaccination initiative that could directly impact vaccination coverage estimates, including a lack of provider reporting, duplicate vaccination records, missing records and information, and issues with the geocoding process assigning individuals to their county of residence. Without a comprehensive and accurate data system, the City and the State will fail to use resources optimally and achieve our objectives of 80% vaccination coverage. See Appendix 3 for the overall logic model supporting this initiative.

Objective 3: By February 2022, have a robust data management, monitoring, and evaluation system continuously providing transparent reporting to city agencies, partners, and residents. This includes an evaluation of the strategy outlined in this plan, as well as COVID-19 vaccination operational and coverage data for all city residents, including the subpopulations outlined in this strategy

Sub-objective 3a: By January 2021, develop a logic model, public-facing COVID-19 vaccination data dashboard, and monitoring plan for BCHD COVID-19 initiative

Sub-objective 3b: By February 2021, launch the public-facing COVID-19 vaccination data dashboard, develop and begin to utilize an internal operational COVID-19 vaccination dashboard, have final data monitoring approaches in place for internal and external consumption

Sub-objective 3c: Throughout, develop COVID-19 vaccination coverage maps, continuously utilize available data and integrate new data sources to grow the evaluation framework, and inform planning and decision making. Provide timely data-driven updates to active task forces and leads of mass vaccination and vulnerable population groups so they can understand progress and if they need to change tactics

- Tactic 1: Monitor vaccines procured, vaccinations provided, and vaccination coverage for Baltimore City and subpopulations through ImmuNet and health tracking systems
- Tactic 2: Track the number and map the locations of vaccination events conducted in coordination or partnership with BCHD

Sub-objective 3d: By February 2022, document evaluation findings on program and results from vaccine hesitancy and other qualitative data in vulnerable populations

Governance

This initiative will be led by the Commissioner of Health under the direction of the Mayor of Baltimore. She will lead a COVID-19 task force that will be the primary forum through which City partners will be apprised of the progress of the initiative and can ascertain how best to

participate. This task force will include health professionals, community and faith-based partners, and relevant city agency and policy makers. While BCHD is the lead agency, implementation of mass vaccination tactics will be coordinated by federal, state, hospital, and academic system partners and focused response tactics will be coordinated primarily by BCHD's emergency response team with health system partners. The communication and education campaigns will be led by BCHD's Communication Office and program operations, with experts in at-scale education and communication efforts.

Objective 4: By January 2021 mobilize city agencies and providers to work collectively to vaccinate against COVID-19 through a COVID-19 Vaccine Task Force. This task force will include health systems, FQHCs, pharmacies, and community- and faith-based organizations to share vaccination data, synchronize vaccination messaging, and synergize vaccination planning efforts

- Tactic 1: By mid-January 2021, identify interested partners
- Tactic 2: By third week in January, launch task force
- Tactic 3: Partner with healthcare systems, healthcare payors, community-based organizations, and pharmacies to fund and administer COVID-19 vaccinations onsite in community-based settings where vulnerable populations reside
- Tactic 5: Hold monthly data and problem-solving meetings
- Tactic 6: Monitor reach of network of partnership

Table 2. Mechanisms for COVID-19 vaccination service provision

Service Mechanism	Description
Mass Vaccination PODs	COVID-19 mass vaccination clinics (drive through or walk-up) will offer safe and efficient delivery of COVID-19 vaccine to a large number of individuals.
Healthcare system	COVID-19 vaccination occurs in inpatient settings (hospitals) or outpatient settings (primary care offices, urgent care, FQHCs).
Pharmacies	COVID-19 vaccination is offered onsite at pharmacies.
Baltimore City Health Department/Rite Aid and Mobile Vaccination Teams	COVID-19 vaccination will be offered to special populations in community sites, at congregant residences, or in neighborhoods and door-to-door. This will occur in partnership with a community group/organization and clinical entity. Service provision sites are temporary and determined through collaboration. Examples include vaccination at homeless encampments, faith-based institutions, community centers, senior housing sites, or other community settings. NOTE: BCHD has very limited supply of vaccine. COVID-19 vaccination is provided in conjunction with other health/public health services.
Others	COVID-19 Testing sites, Employers, etc.