

ARIZONA DEPARTMENT OF HEALTH SERVICES

The Drive Up Model for Mass COVID-19 Testing (aka The “Urban Cookie” Model for Mass COVID-19 Testing)

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Introduction

The Arizona Department of Health Services (ADHS) implemented a statewide testing blitz for five consecutive Saturdays: May 2, 9, 16, 23, and 30, 2020, in order to increase the awareness and availability of COVID-19 testing in Arizona. On April 30, 2020 (Thursday) the Arizona Department of Health Services prepared to run its own testing blitz site, starting 8:00AM on May 2, 2020 (Saturday).

On the afternoon of April 30, 2020, leadership from across the agency met to prepare for the inaugural May 2 testing day. After determining the testing site goals and objectives (including high throughput, no face-to-face contact, no exchange of paper/pencils/goods -- detailed below), it was determined that the standard drive-through model of COVID-19 testing could not achieve them.

An “urban cookie” or drive-up model was instead explored. This drive-up model was based on the curbside and social distancing strategies of Urban Cookies, a Phoenix-based cookie bakery. Urban Cookies has customers drive into a parking space with a sign to TEXT a number with their name upon arrival; the employee delivers their cookie order to a table outside the car and returns to the bakery; the customer then exits the car, retrieves their cookies, and drives away.

After reaching agreement on the testing model, ADHS leadership sent out an open call for volunteers throughout the agency. Volunteers were placed into the following teams: Registration and Technology, Building Services, National Guard, Public Health Laboratory, On Site Registration, Care Teams and Clinical Lead. Preparations were swift and intentional.

Patients began to arrive 44 hours later.

Objectives

The key objectives for this testing site were:

1. To test a large amount of people
2. To have a rapid throughput of patients
3. To have a full electronic registration (no pens or paper)
4. To have patients perform self nasal swab collection
5. To have cell-phone based communications at the testing site
6. To have no face-to-face contact with patients

Summary of the Drive-Up Model

Before arrival, patients registered online for a 10 minute appointment between 8AM and 2PM. Registration was organized by vehicle, and each registration included the names, demographics and contact information of the persons who would be inside that vehicle.

Upon arrival to the testing site, patients were greeted at the front of a covered parking structure and were directed by the National Guard to a marked parking space. The parking space had a sign in front of it with a phone number and instructions for one person in the vehicle to text the number with their last name to serve as notification for their vehicle arrival.

The text went to a Registrar, who assigned the vehicle to a Care Team (A-E). The assigned Care Team then called the person who texted, confirmed the registration of those inside, provided anticipatory guidance, and sent a video showing how to self collect a nasal swab. The Care Team then instructed the car to exit the parking structure and drive to the indicated testing station (#1-10) in the adjacent lot.

Upon arrival to the indicated testing station (#1-10), a member of the assigned Care Team would run out the labeled test kits (swabs, instructions) and care kits (masks, guidance) to the members of that vehicle, and place them on the table next to the vehicle. The driver would exit the vehicle, pick up the test kits and care kits and then return to their vehicle. The members of the vehicle would perform their own testing swabs and then return the test kits to the table. The vehicle would then drive away with their care kits, opening up the testing station for the next vehicle. In total, there were 10-12 vehicles at a time self-collecting their nasal swabs.

For follow-up, those with positive results were called and informed about isolation and other public health recommendations. Those with negative results were emailed and informed about standard public health recommendations.

Details of the Drive Up Model

Before arrival: Online registration

A pre-registration website was developed in order to allow interested participants to schedule an appointment in advance. Data collected included vehicle information, contact information for each individual being tested, consents, and agreements.

After online registration was completed, registered individuals received a confirmation email with their selected schedule, confirmation ID, copies of informed consent and/or self isolation agreements, and instructions/what to expect for their appointment.

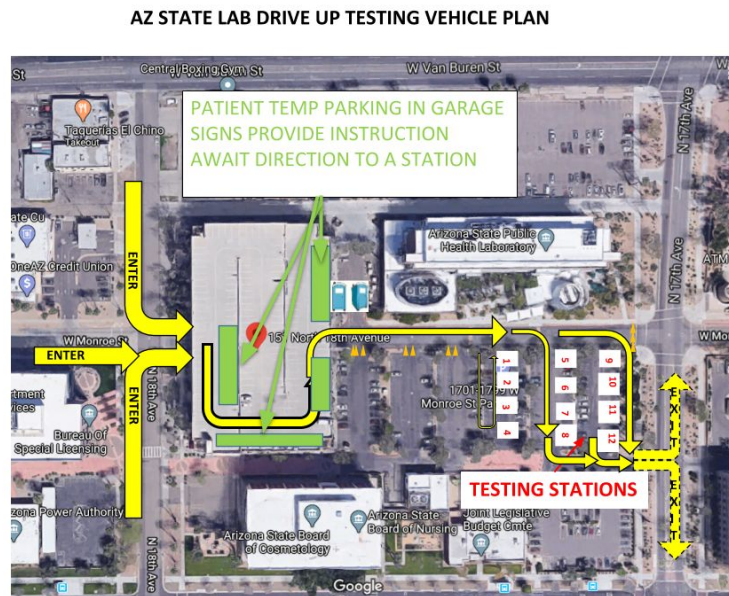
The pre-registration process allowed for advanced printing of test tube labels and lab slips by ADHS. Pre-registration was also a great opportunity to provide patients with guidance for what to expect and informed consent for the procedure they are about to receive.

For more specifics, see *Appendix A: Pre-registration*.

Arrival: Vehicle flow + notification of arrival

Signs directed incoming vehicles to a single entrance of a covered parking garage, and were directed inside by the National Guard. No verbal communication was needed between patients and the National Guard. If directions were unclear, they were written on a portable white board by the national Guard.

Vehicles were directed to park inside the structure in a marked space, with a large sign in front of it with directions to text registration upon arrival. The National Guard monitored the arrivals and exits of the vehicles, occasionally needing to remind vehicles to text the indicated number.



Arrival: Registration confirmation and care team preparations

Upon receipt of the text notification, a Centralized Registrar would note the vehicle and number of persons inside who needed to be tested off a master registration list, and pass off the vehicle and last name to a Centralized Runner, who collected the labeled testing kits and delivered them to an assigned Care Team.

The Care Team Communicator would then call the vehicle and confirm registration and details for all persons being tested. They would read a script of what to expect at the testing site, what the public health recommendations would be if the test was positive/negative, and answer any questions. Any questions they were unable to answer were given to the Clinical Lead to answer. The Care Team Communicator then sent the person a video of how to self-collect a nasal swab. When a testing site was ready, the Care Team Communicator either called the individual or texted them the number of the testing station assigned to them.

**Note:* In the instance that a member of the vehicle was not registered, that vehicle would be reassigned to a Drop In Registrar from the Centralized Registrar, who then called the vehicle and registered the individual(s), including sending them a google form on their phone to complete for consent. Once completed, the Drop in Registrar would return the vehicle to the Centralized Registrar, who would then assign the Care Team.

Arrival: Placement at a testing station and self-collection of nasal swabs

The use of testing stations allowed for multiple patients to be tested at once and to not expose volunteers to patients.

- When vehicles were instructed to exit the structure and park at a testing station, the National Guard guided them along the cones and arrowed signs to the testing stations. Each testing station had a large numbered sign (“Testing Station #1”), a small red or white tent, a large diagram demonstrating self-collection of nasal swabs, and a small outdoor table under the tent.
- When the patient drove to the Testing Station, a Care Team Runner wearing a mask and gloves would meet them at the testing station with care kits and test collection kits. The care kits were deposited on the table next to the vehicle and the labeled test collection kits were deposited onto a styrofoam ice chest attached to the same table. The runners would then return to the building or step away to maintain a 6 foot distance.
- The driver of the vehicle would exit the car, retrieve all care kits and testing kits, and return to their vehicle. Testing Kits were distributed to each person in the vehicle as labeled with the person’s name. Patients would perform the self-swab in their car using the signage and video as a guide. The patients would then return the test collection kits to the plastic bag, give the bags to the driver who exited the vehicle and placed the kits on the styrofoam cooler. The vehicle was then free to drive away with their care kits.
- Once the testing kits were replaced on the table, the Care Team Runner would then retrieve them and carry the test collection kits in the plastic bag that was draped on the cooler back to a larger cooler near the entrance to the lab. A member of the infection control team would open the larger cooler, the Care Team Runner would deposit the test collection kits in the large cooler, then dispose of the plastic bag and gloves in the medical waste container. Care Team Runners would then sanitize their hands and return inside for their next delivery.

- If a patient took the cooler into their car or left the test kits on the table rather than inside the cooler, the runner would take additional steps to sanitize the area. After removing their original gloves and sanitizing their hands, runners would grab a clean pair of gloves and use disinfectant spray and paper towels to clean the tables and coolers. Coolers were left in the sun to dry for several minutes after disinfection.

Two models of testing station assignment were explored over the three consecutive Saturdays. For more information about these models, see *Appendix D: Station Models*.

Follow-up: result notification

- Over the weekend (Saturday and Sunday), the laboratory would alert the ADHS EPI team of the positives. These names, contacts and test results were provided to the Medical Directors at ADHS who would call the individual in order to alert them before the next work week began.
- Early the next week, the laboratory staff would supply a master excel list of every patient, demographics, contact information and test results to the Follow-Up Team. Identified follow-up staff would have access to a common email (COVID19@azdhs.gov) and send negative result form letters to each individual.

Supporting system: Technology

Due to the rapid implementation schedule, instead of creating an mapped texting program (i.e. TEXT COVID to 88888), we utilized 10-12 cell phones with texting capabilities, and assigned them to Registrars and Care Teams.

Technology supplies included: multiple cellular phones, earbuds or noise cancelling earphones, multiple laptops for the registrars, multiple printers for the registrars.

Supporting system: Laboratory + Reimbursement

There were multiple laboratory teams:

- One team did the pre-work of entering and printing out requisition forms and preparing each collection kit.
- One team did the specimen collecting dispensing station, which included sorting and handing the kits off to the person retrieving them.
- One team received the specimens into the laboratory.
- One team performed the testing.
- One team assisted with follow up, which included LIMS support for reporting out to non-traditional clients.

Due to the partnership with the Arizona State Public Health Laboratory, all tests were able to be offered to patients without payment or reimbursement, and no exchange of insurance information was required.

Supporting system: Staff

This was a highly staffed model, but necessary training was minimal and there were no clinical staff needed other than a single Clinical Lead in case of medical urgencies. On the first Saturday, training was done in 30 minutes that same morning. On the second and third Saturdays, training was done the day prior.

Staffing included the following categories:

- Care Teams (5 staff per team, made up of 2 communicators and 3 runners)
- Infection Control (1-2 staff)
- Centralized and Drop in Registrars (3-5 staff)
- Safety and Resources Team (2-3 staff)
- National Guard (16 staff)
- Technology Team (3-4 staff)
- Clinical Lead (1 staff, MD/DO)
- Data collection (1 staff)
- Site Directors (1-3 staff)
- Building Managers (1-2 staff)
- Laboratory Team (22-25 staff)

Of note, the Arizona National Guard was onsite at the request of the Department. They provided a uniformed presence for traffic control as well as manpower for setup and teardown. Anyone providing this role ideally should be uniformed and wearing reflective material. The National Guard helped create a communication plan using radios for team leaders. This design required approximately 15 National Guard personnel plus one team lead.

Supporting system: Supplies

Supplies were able to be sourced from the Arizona Department of Health Services or from contracted vendors within one day. Supplies were categorized into laboratory supplies, care team supplies, testing station supplies, office supplies, signs and staff support supplies.

These are listed in *Appendix B: Supplies*.

Special components:

There were a number of special components that made this a special testing event for patients and volunteer staff.

1. All testing was provided free of charge through the Arizona State Public Health Laboratory. This simplified registration for patients and volunteer staff.
2. As patients waited to go to the testing station, a video was texted to them of the Director of ADHS showing how to perform a self-swab.
3. An Arizona-specific care package was included on the second and third Saturdays of the test blitz. This included reusable cloth masks, guidance on isolation if the test result was positive or negative, and Arizona resources for COVID-19.
4. The medical directors at the Arizona Department of Health Services called each positive case on Saturday or Sunday, in order to alert them before heading to work.
5. ADHS held weekly hotwashes between each event to discuss what worked well and discuss strategies for optimizing the process for the upcoming week.

Overall: week-long schedule

The process of preparing, testing, and follow-up could be completed in a week's time.

1-4 DAYS BEFORE (Tuesday-Friday)	DAY OF TESTING (Saturday)	ONE DAY AFTER (Sunday)	TWO DAYS AFTER (Monday)	THREE DAYS AFTER (Tuesday)
<p>Close down online registration;</p> <p>Meet with Team Leads and discuss changes for the week;</p> <p>Laboratory prepares the lab slips and collection kits;</p> <p>Building and supply services ensure all ready;</p> <p>Team Leads meet with team for training</p>	<p>Team Leads meet at 7AM;</p> <p>Setup of signs and National Guard at 7AM;</p> <p>Team Leads meet with teams at 7:30AM;</p> <p>Testing starts at 8AM;</p> <p>Two 30-minute breaks were built into the registration schedule at 9:30 and 11:30 to give flexibility and time for lunch.</p> <p>Tear-down completed by 2:45PM</p>	<p>All participating staff are emailed with a feedback form on their experience and ideas for improvement;</p> <p>All positive cases are called by ADHS Medical Directors</p>	<p>Meet with Team Leads for Hotwash and to determine changes for the next week</p>	<p>All negative cases are notified via email;</p> <p>Online registration for the next week opens</p>

🍪 Results

Chart 1: There was high patient throughput using a Drive-Up Testing Model.

	Hours of operation	# Testing Stations	# of patients tested	Pre-registered turnaround time (min)	# No Shows	# Patients/hr throughput
MAY 2, 2020	8AM-1PM	10	272	0:24	14	54
MAY 9, 2020	8AM-2PM	10	453	0:26	152	76
MAY 16, 2020	8AM-2PM	12	736	0:29	184	123

Chart 2. Both volunteers and patients were very satisfied with the testing site.



🍪 Challenges

1. **No shows.** The no show rate increased with the number of days ahead of time that the person registered. The no show rate increased for those with afternoon appointments.
2. **Lengthy Drop In Registration.** Pre-registered individuals had a rapid throughput; however if someone in the car hadn't registered, it would take significant time. One Saturday had 147 drop-ins arrive at the same time and it required rapid implementation of additional communicators, printers and test collection kit organizers. An additional complication included the need to create a separate data collection tool to obtain patient contact information (e-mail) and informed consent and self isolation agreements.
3. **Patient confusion.** Due to the novelty of the method (e.g. phone management only, no face to face interaction) some patients (few) were confused about next steps, even as they were parked in front of signs with the instructions.

4. Early arrival. Some patients arrived over an hour early for their appointment. This was most problematic in the morning when all available time slots were booked. In order to process the early arrivals, we began screening at 7:45AM on the third Saturday.
5. Care Team staffing ratio. During the first Saturday, each Care Team had one communicator, two testing stations, and three runners. The communicator would be busy on the phone non-stop and the testing stations were not maximized (partially due to the number of drop-ins). During the second Saturday, each Care Team had two communicators, two testing stations and three runners. This enabled the Care Teams to improve testing station utilization and the communicator workload. During the third Saturday, an additional Care Team was created, but by midmorning we reverted back to the model of assigning testing stations, closed down the sixth care team and rotated assignment of the additional bays to care teams that were backlogged. Two communicators with three runners worked well as it allowed for flexibility within the team. The choke point was the number of testing stations. Having additional testing stations for overflow would be ideal.
6. Communicating process changes to the Care Team. During the event, it was challenging to communicate process changes to the Care Teams because the communicators are on phones at different times and runners are constantly moving in and out of the area. The built in breaks did allow for some down time to communicate widespread updates.
7. Unforeseen circumstances. There were unknown circumstances that required on the spot problem solving: confused patients, car wouldn't start, patient fell asleep, patient's phone went dead, etc. It was helpful to have leadership from the National Guard and ADHS to fix these throughout the day.

Lessons Learned

1. This model is one of the fastest mass testing models we've seen.
2. This model requires significant staffing, but no specialized training.
3. This model is cell-phone based, so it may not work for older populations.
4. Staff enjoyed participating and patients provided excellent feedback.

Resources Utilized

- [ARIZONA] Standing orders for mass COVID-19 testing:
<https://azdhs.gov/preparedness/epidemiology-disease-control/infectious-disease-epidemiology/index.php#novel-coronavirus-healthcare-providers>
- [ARIZONA] Sample consent language for mass COVID-19 testing:
<https://azdhs.gov/preparedness/epidemiology-disease-control/infectious-disease-epidemiology/index.php#novel-coronavirus-healthcare-providers>
- [ARIZONA] Sample email for positives and negatives:
<https://docs.google.com/document/d/1OE-xnbTNGCMfPNBErqNT9g-LsJ5Cy5jt11yeYL6BZJw/edit?usp=sharing>

- [NATIONAL] Colorado Department of Public Health & Environment; Office of Emergency Preparedness & Response; COVID-19 Drive Thru Community Testing Center Plan
- [NATIONAL] ASPR Tracie Lessons Learned:
<https://files.asprtracie.hhs.gov/documents/aspr-tracie-ta-drive-through-testing-3-16-2020.pdf>
- [NATIONAL] Nasal Self-Swab Concept of Implementation; Overview of Adjusted Operations Using Less Invasive Nasal Self-Swab Testing Method (US HHS, USDHS, FEMA, 2020)



APPENDIX A: Pre-Registration Page



ARIZONA DEPARTMENT
OF HEALTH SERVICES

COVID-19 Testing Registration

Thank you for your participation in the Arizona Department of Health Services COVID Drive Up Testing Site. Please fill out the following vehicle and individual information in preparation for testing.

Please note, since this is a self-administered specimen collection, individuals must be old enough to perform a self nasal swab OR parents must be able to administer the test on their child.

Registration for this event closes at 10:00am, May 15th, 2020.

Vehicle Information
Number of people being tested *
<input type="text" value="1"/>
Employee Identification Number (EIN) *
<input type="text"/>
Employee Email Address *
<small>A confirmation email will be sent to this address.</small>
<input type="text"/>
Confirm Email Address *
<input type="text"/>
Vehicle Make *
<input type="text"/>

Person #1
First Name *
<input type="text"/>
Last Name *
<input type="text"/>
Date of Birth *
<input type="text"/>
Sex *
<input type="text"/>
Street Address *
<input type="text"/>
City *
<input type="text"/>
State *
<input type="text" value="Arizona"/>
ZIP Code *
<input type="text"/>
County *
<input type="text"/>

IF I HAVE SYMPTOMS:

- I agree that if I have symptoms, I will remain in self-isolation until my COVID-19 test results return.
- I agree that if I have symptoms and my COVID-19 test results are **positive**, I will remain isolated for 7 days from the day of testing OR until at least 72 hours after my symptoms have resolved, whichever is longer.
- I agree that if I have symptoms and my COVID-19 results are **negative**, I will stay at home or under isolation precautions until **72 hours** after all symptoms of acute infection resolve.
- I understand that if I have symptoms and am not isolated while ill, I could pose a substantial threat to the health of other persons.
- I agree that if I have symptoms, I will not come into contact with any other person who is not isolated or ill due to potential COVID-19 infection.

IF I DO NOT HAVE SYMPTOMS:

- I understand that if I do not have symptoms and my COVID-19 test results are **negative**, I do not require isolation.
- I understand that if I have no symptoms and my COVID-19 test results are **positive**, I agree to stay at home or under isolation precautions for 7 days from my testing date.

APPENDIX B: Supplies

The necessary supplies were categorized into laboratory supplies, care team supplies, office supplies, signs and staff support supplies.

Laboratory Supplies

- Test kit
 - Labeled test tube
 - Lab slip (requisition form)
 - Nasal swab
 - Sample collection instructions
 - Biohazard specimen bags
- Styrofoam coolers and ice packs
- Bins for medical waste
- Large cooler with ice for specimen drop off

Care Team supplies

- Care Kits to give to patients
 - Reusable cloth mask
 - Isolation guidance
 - Arizona COVID-19 related resources
 - Ziploc bags
- PPE Supplies
 - Disposable masks
 - Disposable gloves in various sizes
 - Hand sanitizer
 - Safety vests
 - *Emergency supplies (if there was a need to interact with patient)*
 - *Face shields*
 - *Gowns*

Testing Station Supplies

- Outdoor Tables
- Outdoor pop-up tent for each testing station
- Disinfecting spray
- Paper towels

Office Supplies

- General office supplies (pens, highlighters, sticky notes, etc.)
- Folders
- Secure shred bin for disposing of PHI

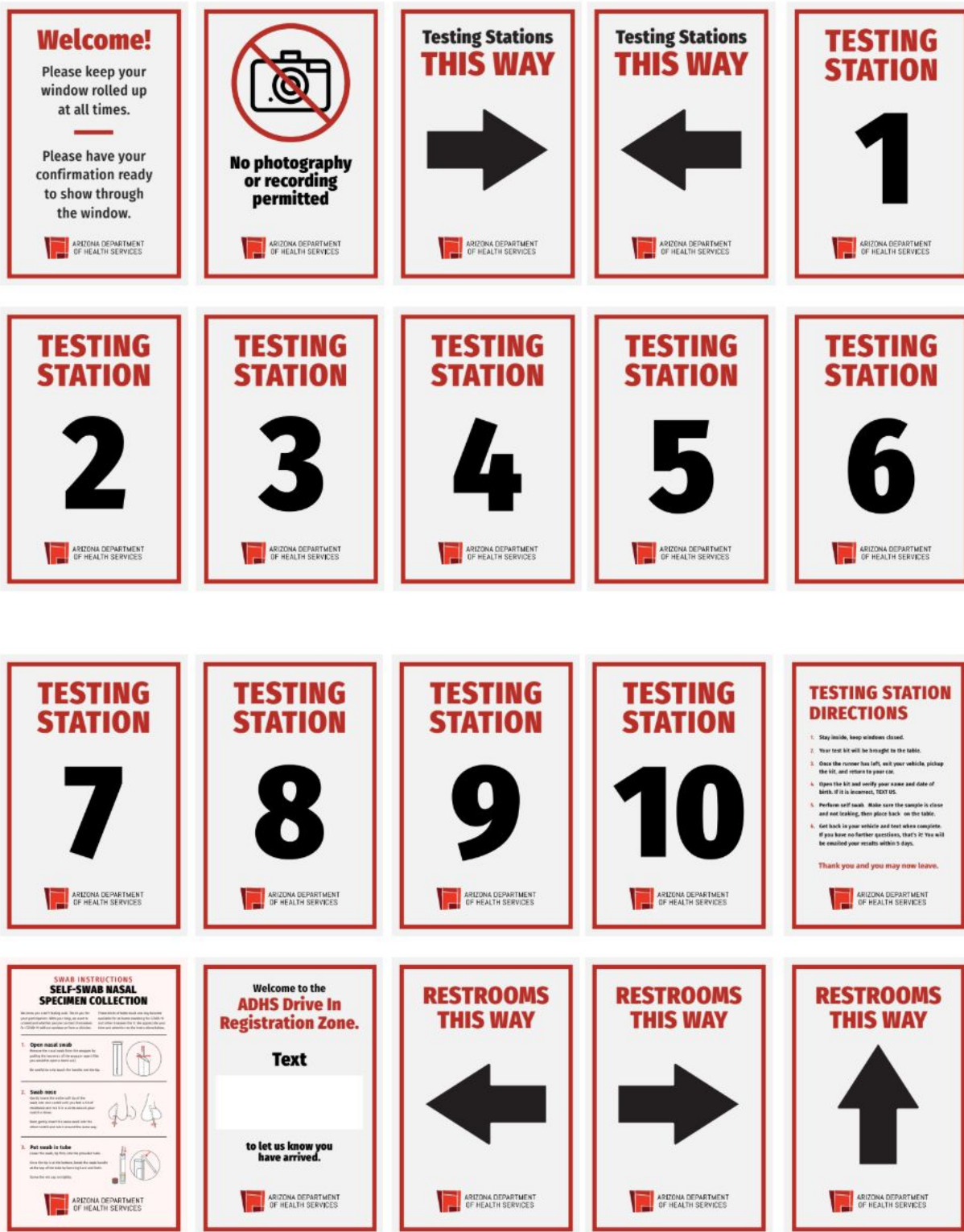
Signs (See *Appendix C: Signs*)

- Arrive and text signs
- Testing station signs
- Self collection signs
- White Boards and dry erase markers (in case further communication needed)

Staff support supplies

- Radios for communication between team leads
- Ice and water
- Coolers
- Meals
- Sign in sheets
- Confidentiality forms for volunteer staff

 APPENDIX C: Signs



APPENDIX D: Station Models

There were two different models that were experimented with to maximize the throughput in the Testing Stations. There were advantages and disadvantages to both.

- For the first two Saturdays, each Care Team was *assigned* two Testing Stations (e.g. #1 and #2), and they would text patients when one became available and the patient would drive to their assigned stations (e.g. #1 or #2).
- On the third Saturday, the Care Team texted the patient to proceed to the testing stations, and the National Guard directed patients to park in the first available station (e.g. #1-12). This was attempted for a short time before reverting to the prior model.

	Station assigned by the Care Team (e.g. either #1 or #2)	Station assigned by first available, waterfall approach (e.g. #1-12)
Advantages	<p>Easier for the runners to locate the patient;</p> <p>Served as an additional validation of the patient prior to delivering the test collection kits;</p> <p>Runners could deliver the kits before the patient arrived and patients could watch the video in the initial parking spot before they received their testing space assignment.</p>	<p>Ensured all bays were filled throughout the screening event, allowed for greater throughput;</p> <p>Reduced wait times for patients;</p> <p>Patients could read signage and watch the video while waiting for the runner to arrive with the kits.</p>
Disadvantages	<p>Lag between bay assignment and arrival at the testing station, which restricted the number of vehicles that could be processed;</p> <p>Confusion over the directions, patients would park in the wrong testing station.</p>	<p>Required runners to communicate with the National Guard directing the vehicles and to identify cars based on make and model;</p> <p>Allowed for potential error in delivering labeled test collection kits when similar make/model of vehicles, or misidentification of vehicles occurred;</p> <p>Challenging to track vehicles that skipped initial check in or who had not otherwise been assigned to a care team.</p>



