An Academic-Community Based Partnerships to Address Vaccine Uptake in the Borderlands
TEAM MEMBERS

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INTRODUCTION

Misinformation
Especially in rural communities

Vaccine hesitancy
Leading to ↓ coverage
Rural countries = 38.9%
Urban counties = 45.7%

Lack of resources
Could promotores be of use?
Universities
Pros: Infrastructure, technical assistance, passionate and engaged students

Opportunities for collaboration

Communities
Pros: Trust, first hand knowledge, insight, inclusion
ACADEMIC COMMUNITY PARTNERSHIPS

Participatory
- Collaboration through participation
- Empowerment of participants

Action
- Change – real life experience
- Evidenced in terms of different outcomes

Research
- New knowledge
- Documented lessons
To better assess vaccine awareness amongst promotores, healthcare providers, and community members in rural AZ communities as well as address their vaccine hesitancy using four different modalities:

- **Arm #1** = module project
- **Arm #2** = video project
- **Arm #3** = awareness project
- **Arm #4** = distribution project
Arm #1

An academic-community partnership to train promotores to address vaccine hesitancy in rural, border communities
Methods to date Training Module Creation

- Three different module slide decks
  - General vaccination topics
  - Influenza
  - COVID-19
- Address vaccine science, safety, efficacy, and misconceptions
  - Provide up-to-date
- In English and Spanish

Agenda

- History of vaccines
- Vaccine approval process
- Physiological response to vaccinations
- Creation of vaccines
- Herd immunity
- Common myths about vaccines
- List of available vaccines
- Recommended vaccines by population
- Common vaccine side effects
- Vaccine effectiveness
- Locations for vaccinations
- Vaccination pearls
- Module effectiveness and satisfaction
Module presentations and surveys

- Conducted in-person or over video-streaming service
- Must be a CHW or promotore in rural AZ
- Must watch at least module → take survey
- Retrospective pre-post survey
  - Likert scale and free-response question types
  - Topics addressed
    - Knowledge of vaccines
    - Efficacy, confidence in addressing vaccine hesitancy
    - Perceived quality/satisfaction of training(s)
    - Various demographic questions
An academic-community partnership to train promotores to address vaccine hesitancy in rural, border communities

Adrian Acufía, PharmD Candidate; Jose Bustamante, PharmD Candidate; Danielle Chellman, PharmD Candidate; Daniel Tellez, PharmD Candidate; Elizabeth Hall-Lipsy, JD, MPH, Faculty advisor

Background

Vaccines - proven efficacy to prevent infectious disease

Vaccine hesitancy - delay in acceptance or refusal of vaccination despite availability of vaccination services
  - More prevalent in rural communities (including communities along US-Mexico border)
  - Leads to lower vaccination rates despite increased need due to lack of economic and healthcare resources
  - Misinformation is a main cause of the hesitancy

Promotores: lay community healthcare workers that share similar socioeconomic/cultural traits as their patients

Purpose: to measure the impact of a student-developed and -delivered training program for promotores in rural and border communities of Arizona

Methods to Date

Training module creation
  - Three student-developed training modules concerning general vaccination topics, influenza, COVID-19
  - Provide up-to-date information addressing the science, safety and efficacy of vaccines

Survey creation
  - Survey design and pre-post survey with Likert scale and free-response question types
  - Topics include: knowledge of vaccines, self-efficacy and self-confidence in addressing vaccine hesitancy, perceived quality/satisfaction of the training(s) provided, various demographic questions

Next Steps / Future Direction

Present modules to promotores + survey writing process
  - Recruit promotores from SEAHEC (Southeast Arizona Area Health Education Center)
  - Modules may be presented in person (likely at SEAHEC headquarters) or online via Zoom
  - SS-Waranv gift card used for incentive for survey participation (funded by HRSA)

Analyze survey data
  - Software utilized = SPSS and Qualtrics
  - Tests = descriptive statistics, Chi Square/Fisher’s Exact, Wilcoxon Rank Sum tests, logistic regressions
  - When survey is considered “complete” = 75%

Implement longitudinal group
  - To determine long-term retention of module information 1-3 months after the module presentation(s)

Challenges and Limitations

Consistently changing vaccine information (particularly for COVID-19 vaccines)
  - Consistently need for new iterations of modules added complexity to study development
  - Needed to balance accuracy and pertinence of provided information vs. desire to conduct research in in an acute time period of the COVID-19 pandemic

Survey study inherent limitations:
  - Balancing desire for comprehensive data vs. providing only pertinent information to increase participation
  - Risk of survey sharing or taking survey without significant interest (e.g. only for the gift card)
  - Survey not taken by intended participants (e.g. wrong population, duplications)

Time considerations of student-driven research
  - Demanding curriculum, other commitments make time-effective research difficult for students

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ITB approval process underway with the University of Arizona ITB

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Contact Daniel Tellez (dtellez@pharmacy.arizona.edu) or Elizabeth Hall-Lipsy (ehall@pharmacy.arizona.edu) with any questions or comments about this study
Methods Next Steps

Present modules to promotores → Survey willing promotores/CHWs
- Recruit Promotores/CHWs from SEAHEC
- $5 Walmart gift card used for incentive (funded by NHRA)

Analyze survey data
- Software utilized = SPSS and Qualtrics
- Tests = descriptive statistics, Chi-square/Fisher’s Exact, Wilcoxon Rank Sum tests, logistic regressions
- Survey is considered “complete” at 75%

Implement longitudinal group
- To determine long-term retention of module information (1-3 months after presentation)
Arm #2
Evaluation of community-based video program aimed at decreasing vaccine hesitancy in rural Arizona populations
Videos

“Vaccine Hesitancy”

“Why I Got the Vaccine”
Surveys

- 10 pre/post questions
  - Opinions on various COVID-19 topics now and retrospectively
- 6 satisfaction questions
- Various demographic questions
- Link to outside survey for $5 Walmart electronic gift card
Data collection

- **SEAHEC** in charge of recruitment, eligibility, and consent

- Participants solicited at public health events
  - Must watch at least one video
  - Must be 18 years and older
  - In Pima, Santa Cruz, Cochise, Graham, and Greenlee counties
Analysis

- Done via descriptive statistics and Wilcoxon Signed-Rank tests
Arm #3
Surveying rural health care workers for vaccine hesitancy concerns
METHODS

Survey creation

Participant recruitment

Data Collection

Data Analysis
Data collection surveys

- One for HCWs | one for promotores
- Includes introduction (with consent)
- Vaccine questions - Likert scale, free-text
- Demographic questions

Electronic gift card survey - $5 at Walmart

- Incentive to participate
- Requires name and email

Both available in English and Spanish
Participant recruitment and data collection

Locations = CHCs in rural, southern AZ
- Mariposa Community Health Center
- Chiricahua Community Health Centers

Recruitment strategies
- Email | face-to-face | flyers
- Provided link/QR code to survey

Time to take survey(s) ~ 5-10 minutes
- Data stored on Qualtrics and Box @UA
## RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Providers</th>
<th>Promotores</th>
<th>X² P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants (N)</td>
<td>24</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Local resident/non-commuter</td>
<td>20 (83%)</td>
<td>25 (100%)</td>
<td>p=0.016*</td>
</tr>
<tr>
<td>Gender - Female</td>
<td>16 (67%)</td>
<td>23 (92%)</td>
<td>p=0.028*</td>
</tr>
<tr>
<td>Ethnicity - Hispanic</td>
<td>12 (50%)</td>
<td>24 (96%)</td>
<td>p=0.001*</td>
</tr>
<tr>
<td>Education - College or higher</td>
<td>21 (88%)</td>
<td>11 (44%)</td>
<td>p=0.008*</td>
</tr>
<tr>
<td>Age - Over 45 years old</td>
<td>10 (42%)</td>
<td>17 (68%)</td>
<td>p=0.064</td>
</tr>
<tr>
<td>Vaccine update</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;80% of colleagues are vaccinated</td>
<td>22</td>
<td>21</td>
<td>p=0.413</td>
</tr>
<tr>
<td>&gt;80% of community is vaccinated</td>
<td>11</td>
<td>15</td>
<td>p=0.0321*</td>
</tr>
<tr>
<td>&gt;80% of community has received booster</td>
<td>7</td>
<td>9</td>
<td>p=0.610</td>
</tr>
<tr>
<td>&gt;70% of children are vaccinated</td>
<td>6</td>
<td>8</td>
<td>p=0.767</td>
</tr>
<tr>
<td>Vaccine attitude/knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree vaccines are safe and effective</td>
<td>23</td>
<td>21</td>
<td>p=0.171</td>
</tr>
<tr>
<td>Comfortable disucssing vaccine topics</td>
<td>22</td>
<td>17</td>
<td>p=0.04*</td>
</tr>
<tr>
<td>Rural communities aren't as dense thus don't need vaccines</td>
<td>4</td>
<td>6</td>
<td>p=0.524</td>
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<tr>
<td>Health information sources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health professionals</td>
<td>22</td>
<td>22</td>
<td>p=0.966</td>
</tr>
<tr>
<td>Family and friends</td>
<td>2</td>
<td>7</td>
<td>p=0.076</td>
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<tr>
<td>Internet</td>
<td>17</td>
<td>12</td>
<td>p=0.104</td>
</tr>
<tr>
<td>Social media</td>
<td>3</td>
<td>5</td>
<td>p=0.478</td>
</tr>
</tbody>
</table>
**RESULTS**

**Prevalence of COVID-19 Vaccinations**

<table>
<thead>
<tr>
<th>Percent of</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Colleagues</strong> with primary series</td>
<td>88% (43/49) = 80%+</td>
</tr>
<tr>
<td><strong>Community</strong> with primary series</td>
<td>27% (13/49) = 70%&lt;br&gt;53% (26/49) = 80%+</td>
</tr>
<tr>
<td><strong>Community</strong> with a booster</td>
<td>24% (12/49) = 60%&lt;br&gt;20% (10/49) = 70%&lt;br&gt;33% (16/49) = 80%+</td>
</tr>
<tr>
<td><strong>Children</strong> with primary series</td>
<td>33% (16/49) = 50%&lt;br&gt;All other options with lower frequencies</td>
</tr>
</tbody>
</table>
Most important reasons to get vaccinated
- Protection = 57% (27/47)
- Prevention of COVID-19 = 51% (24/47)
- Minimize death = 28% (13/47)
- Limit hospitalizations = 28% (13/47)

Most common reasons not to get vaccinated
- Misinformation = 53% (25/47)
- Fear and lack of trust = 42% (20/47)
- Side effects = 32% (15/47)
- Personal beliefs = 30% (14/47)

Demographic groups where education is targeted
- Less than 18 years old = 37% (17/46)
- Minority groups = 33% (15/46)
- Older population = 22% (10/46)
- Parents = 20% (9/46)
## DEMOGRAPHIC TABLE

<table>
<thead>
<tr>
<th>Demographic Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age Range</strong></td>
<td>Plurality = 35-44 years</td>
</tr>
<tr>
<td><strong>Race/Ethnicity Hispanic</strong></td>
<td>73% overall (36/49)</td>
</tr>
<tr>
<td></td>
<td>Almost all promotores (24/25)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>39 female, 10 male</td>
</tr>
<tr>
<td></td>
<td>Almost all promotores (23/25)</td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td>Doctoral degree = 5/49 (only providers)</td>
</tr>
<tr>
<td></td>
<td>Graduate degree = 7/49 (mostly providers)</td>
</tr>
<tr>
<td></td>
<td>Promotores = 13/25 w/ some college or high school equivalent degree</td>
</tr>
<tr>
<td><strong>Local/noncommuter</strong></td>
<td>100% of promotores</td>
</tr>
<tr>
<td></td>
<td>83% (20/24) of providers</td>
</tr>
</tbody>
</table>
Discussion ideas for intervention

Rural communities are not as densely populated as larger cities so vaccines are not as necessary.
- 20% (10/49) = agree or strongly agree
- 63% (31/49) = strongly disagree

I am comfortable discussing vaccine topics with patients.
- 27% (13/49) = strongly agree | 53% (26/49) = agree
- 20% (10/49) = disagree or strongly disagree
- *Pearson Chi-Square significance = 0.04

Vaccinations are safe and effective in preventing outbreaks of serious illnesses.
- 59% (29/49) = strongly agree | 31% (15/49) = agree
- 10% (5/49) = disagree or strongly disagree
- *Pearson Chi-Square significance ~ 0.007
Arm #4
Challenges and Limitations of COVID-19 Vaccine Distribution to FQHCs
Overview:

- In early 2021, vaccination efforts began in earnest and the federal government provided vaccines to the states.
- States each individually developed their own distribution and allocation plans.
- This framework for vaccine prioritization was intended to support local and tribal health departments to get their communities vaccinated.
Vaccine distribution and access challenges

- State run distribution centers:
  - Maricopa County – State Farm Stadium | Arizona State’s Phoenix Municipal Stadium
  - Pima County – University of Arizona Main Campus and South Campus

- Challenges with using online system for registration
- Insufficient and inconsistent vaccine supply
- Confusing eligibility criteria
- Rigid storage requirements, and a short period between vaccine preparation and expiration
Methods = to identify and compare challenges and opportunities described by FCHQ clinics during vaccine rollout

- **Design**: Cross-sectional study used structured telephonic interviews and electronic surveys.
- **Subjects**: Vaccine coordinators from FQHCs
- **Measures**: Data was collected using a 24 item questionnaire / semi-structured interview.
  - The questionnaire/guide was separated into 4 sections; general, challenges, effective strategies, and future recommendations
- **Analysis**: The themes seen among rural and urban FQHCs were compared by:
  - Reviewing the written transcripts and identified codes within the responses
  - Comparing themes across investigators for consistency and congruence
  - Categorizing themes and calculated the number of participants that fall in each theme.
Results Five overarching themes

(1) the lack of public health communication channels (83%)
(2) vaccine hesitancy and misinformation (83%)
(3) workflow and staffing difficulties (100%)
(4) ineffective state distribution and management (67%), and
(5) problems with inventory and the storage of vaccines (83%)
Results

- It is more important to vaccinate less populated areas than densely populated areas:
  - Strongly Disagree: 2
  - Disagree: 3
  - Agree: 2
  - Strongly Agree: 1

- It is more important to vaccinate densely populated areas than less populated areas:
  - Strongly Disagree: 1
  - Disagree: 3
  - Agree: 8
  - Strongly Agree: 3

- The federal government advocates that vaccinating rural communities is just as important as vaccinating rural areas:
  - Strongly Disagree: 1
  - Disagree: 3
  - Agree: 2
  - Strongly Agree: 1

- The federal government provided sufficient assistance in the vaccine rollout in rural communities:
  - Strongly Disagree: 1
  - Disagree: 3
  - Agree: 2
  - Strongly Agree: 1

- The responsibility of getting vaccinated lies with individuals:
  - Strongly Disagree: 3
  - Disagree: 3
  - Agree: 2
  - Strongly Agree: 1

- The state advocates that vaccinating rural communities is just as important as vaccinating urban areas:
  - Strongly Disagree: 4
  - Disagree: 3
  - Agree: 2
  - Strongly Agree: 1

- It is important to get the vaccine to the underserved:
  - Strongly Disagree: 1
  - Disagree: 6
  - Agree: 3
  - Strongly Agree: 1
### Challenges

| Lack of public health communication channels | “I believe we have not yet done enough to address communicating correct information”  
|                                             | “We have also tried to utilize our social media platforms to communicate [accurate] information about COVID vaccines” |
| Vaccine hesitancy and misinformation         | “Public fear of ‘under tested’ vaccine”  
|                                             | “One of the biggest challenges we faced was vaccine hesitancy”  
|                                             | “...growing spread of misinformation, disinformation, conspiracy theories, & rumors through online platforms...” |
| Workflow and staffing difficulty            | “Pharmacy initially given the job [to vaccinate] with little support/extra help”  
|                                             | “Lack of staffing then and now” |
| Ineffective state distribution and management | “...the organization we went through would change the amount [of vaccines] we would get”  
|                                             | “...distribution could have been better if the COVID vaccines had been added to Drug Distribution channels sooner” |
| Problems with inventory and storage of vaccines | “Smaller sites had more trouble with wasting Moderna vaccines because they come in packs of 10, whereas Pfizer was groups of 6”  
|                                             | “One challenge anticipated was cold storage” |
Clinic identified effective strategies

- **Rural Clinic 1**: Partnering with county, use of volunteers, help from different departments within the clinic.
- **Urban Clinic 1**: Using previous workflow strategies, drive-thru flu vaccine, which became drive-thru COVID-19 testing and vaccines.
- **Rural Clinic 2**: Developing efficient vaccine administration workflows, public announcements via social media platforms, opening to both Chiricahua patients and non-Chiricahua patients, allowing walk-in vaccinations.
- **Rural Clinic 3**: Vaccine cards and drive-thru vaccine clinics.
- **Urban Clinic 2**: Scheduling doses in pairs (Moderna and Pfizer); one way flow in the clinic (entered, get vaccinated, be observed, exit in a one way flow manner).
- **Rural Clinic 4**: Created a COVID-19 team where they have staff dedicated to performing all COVID-19 duties (vaccinations or swabbing). Having scheduled times to perform the duties as well has helped keep the program organized.
Most of the challenges experienced during the COVID-19 vaccine rollout between urban and rural Federally Qualified Health Centers in Arizona were different.

Many of the rural clinics came across issues with ordering the vaccines, administering the vaccines to the public in rural areas, and finding the staff, whereas the urban clinic reported trouble with storing, minimizing waste, and reporting. There were several similarities seen between the rural and urban clinics when it came to strategies used for the vaccine rollout, which included using previous vaccine workflows and attending webinars and training sessions held by the state and vaccine manufacturers.
Vaccines/COVID-19 = 
transient

Vaccines/COVID-19 =
polarizing

Limitations of single state research: limited by geography and populations

Inherent survey limitations
Contact Information

Contact Daniel Tellez (dctellez@pharmacy.arizona.edu) or Elizabeth Hall-Lipsy (ehall@pharmacy.arizona.edu) with any questions or comments about this study.

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THANKS!

DO YOU HAVE ANY QUESTIONS?

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