A Rapid Review of COVID-19 Vaccination Roll-Out

Lessons learned on service delivery and integration

September 2022
Acknowledgements

A systematic review of COVID-19 vaccine roll-out experiences and lessons learned is being undertaken by the World Health Organization (WHO), the U.S. Agency for International Development (USAID) MOMENTUM Country and Global Leadership project, and COVID GAP, to produce learnings for program audiences at all levels—global, regional, country, and sub-national. This slide deck is the first in a series of multiple rapid review products, highlighting learning, best practices, and recommendations for one of the eight selected themes.
Contents

1. Executive Summary
2. Background and Objectives
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Executive Summary

Background
Spearheaded by WHO, USAID’s MOMENTUM Country and Global Leadership project, and COVID GAP, this systematic review on the COVID-19 vaccine roll-out experience provides early findings from the first rapid review on the theme of service delivery and integration.

Service Delivery & Integration

Methods
We combined the rigors of a systematic review with the time-bound delivery of a rapid review learning product. Limitations: Most studies conducted in early phase of COVID vaccine roll-out and in high-income countries.

- First round of rapid review
- 25 studies analyzed

Three Service Delivery Models

Mass Vaccination sites require multi-disciplinary teams of clinical and administrative staff to run effectively.

Mobile Vaccination clinics typically employ varied community mobilization strategies to bring in people to the clinics for vaccination.

Fixed-Post Vaccination sites require the least amount of spatial adaptation because they are purpose-built, however, mobilization is critical.

Key Takeaways

- Deploy diverse, inter-personal communication strategies
- Cultivate leaders and champions for vaccination
- Generate Demand with Trust

Recommendations
Adapt Strategies to Current Context
- Emphasize walk-in opportunities
- Pursue partnerships – community volunteers, students, private sectors
- Frequent, evidence-based communication

Generate Demand with Trust
- Deploy diverse, inter-personal communication strategies
- Cultivate leaders and champions for vaccination
Background

• COVID-19 vaccination efforts are faced with challenges around the distribution, delivery, and demand for the vaccines. The COVID Vaccine Delivery Partnership is shifting country assistance towards the scale-up of vaccinations, particularly for high-priority populations (such as healthcare workers, elderly people, people with comorbidities, pregnant women, etc.) and towards integration of COVID-19 vaccination into immunization programs and primary health care (PHC).

• Learning from experiences, best practices, and innovative solutions can help countries in their efforts to scale-up and optimize COVID-19 vaccine delivery

The systematic literature review will cover eight thematic areas on COVID-19 vaccine rollout and produce rapid reviews:

- Political Will & Financing
- Supply & Logistics
- Planning & Coordination
- Demand & Uptake
- Service Delivery & Integration
- Health Workforce
- Monitoring & Evaluation
- Adverse Event Monitoring & Management

This presentation provides early findings from the first rapid review on the theme of service delivery and integration
Objectives of Service Delivery and Integration Rapid Review

1. **Describe the different service delivery models for COVID-19 vaccine rollout.**

2. **Describe adaptations** made for integrated service delivery and for reaching different priority groups in different contexts.

3. Synthesize the **best practices and lessons learned** from these rollout strategies.
Methods

We combined the rigors of a systematic review with the time-bound delivery of a rapid review learning product

- Conducted the search in: PubMed, Scopus, GIM Text, GIM numeric using developed search criteria
- Two persons independently screened each title and abstract and full text in COVIDENCE
- An initial title and abstract screening of a sample of 1,000 papers was done to inform domain specification, development of the abstraction tool, and refinement of search strategy
- Inclusion and exclusion criteria were pre-specified
- Data was abstracted on Excel and analyzed on Dedoose
- First round of rapid review on service delivery and integration consists of 25 papers
- Synthesis was by vaccine delivery models
Results
Overall, 25 papers were analyzed. These were largely from high-income countries, had short duration, and commenced in the early phase of the COVID-19 vaccine rollout.

Majority of studies (84%) are from high-income countries

USA (13), Italy (2), Malta (2), South Africa (2), Israel (2), Germany (1), Sudan (1), England (1), China (1)

Median study duration was 2 months; 13 (56%) studies began within the first 4 months of COVID-19 vaccine rollout in Q1 of 2021
Results showed three main service delivery models:

Mass vaccination

High-volume, high-speed vaccination activities, typically conducted in non-health care settings for rapid vaccine delivery during health emergencies.

Mobile vaccination

Mobile vaccination is an umbrella term to describe various initiatives to bring vaccination services closer to communities in need on a small scale. Typically targets rural areas, underserved minorities and socially marginalized populations.

Fixed-post vaccination

Vaccination services that are provided in a purpose-built or adapted permanent/semi-permanent physical structure, usually within health care settings, like an immunization clinic in a hospital or primary health care facility. It could also refer to non-traditional health care settings, such as school health clinics.
Mass vaccination sites were observed to have five functional steps with adaptations made for different contexts.

Each site requires a multi-disciplinary teams of clinical and administrative staff to run effectively.

<table>
<thead>
<tr>
<th>Appointments &amp; mobilization</th>
<th>Registration &amp; screening</th>
<th>History taking</th>
<th>Inoculation</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What?</strong></td>
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</tr>
<tr>
<td>Pre-registration through web-portals, phone, etc.</td>
<td>Verification, symptom screening, consenting</td>
<td>Documenting history of anaphylaxis/allergies/co-morbidities</td>
<td>Process of getting the shot</td>
<td>Precautionary post-vaccination observation</td>
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<td><strong>Adaptations</strong></td>
<td><strong>Adaptations</strong></td>
<td><strong>Adaptations</strong></td>
<td><strong>Adaptations</strong></td>
<td><strong>Adaptations</strong></td>
</tr>
<tr>
<td>Facility-initiated appointment system with flexibility to reschedule [SA9]</td>
<td>COVID-19 vaccine info sheets in multiple languages and translators on site to overcome language barriers [USA11]</td>
<td>Unified history taking and inoculation steps to reduce time wastage, increase convenience [SA22]</td>
<td>In batches according to the number of stations available [SA9] or one-by-one as people walked or drove in [USA15]</td>
<td>15-min mandatory waiting for those without history [USA15, SA9, SA22, Malta5], 30 mins for those with prior history of allergies [Malta5, SA22, USA15]</td>
</tr>
</tbody>
</table>

**Lessons learned**

**Challenges**

- Pre-vaccination/mobilization
  - Lack of a system to categorize potential clients by their risk-level [SA9]
  - Inability of system to optimize appointment slots with HCWs availability [SA9]

- At vaccination
  - Compromise in regular clinical care in order to meet staffing needs of mass vaccination sites [SA9]

**Enablers**

- Partnerships with private sector partners, local hospital systems for scheduling support, planning, inventory management, and set-up and maintenance of data systems
- Partnerships with local medical groups for infection prevention and control, site security, supply of medical equipment [USA24]
- Partnerships with local community and university for volunteer support [SA22]
Mobile vaccination clinics employed various strategies to execute the three main functional steps.

**Community Mobilisation**
- Strategies
  - Information, education and communication (IEC) campaigns delivered through channels/people trusted by the target population and who have an existing rapport with the community. [USA\textsuperscript{25}]
  - Catalysing events brought together a wide range of experts and stakeholders to address questions, concerns, myths and misconceptions. [USA\textsuperscript{25}]

**Appointment / Registration**
- Strategies
  - Religious/faith leaders managed registration and appointment lists for their communities to show their support and encouragement for COVID-19 vaccines. [USA\textsuperscript{25}]

**Inoculation**
- Strategies
  - Integrated/single window service provision of COVID-19 vaccines along with other valuable services to the community [USA\textsuperscript{17}]
  - Incentives (financial and non-financial) to encourage vaccine uptake [USA\textsuperscript{17}]
  - Multilingual mobile apps to facilitate conversation between providers and patients who don’t speak the common language [China\textsuperscript{23}]

**Challenges**
- Pre-vaccination/mobilization
  - Historical mistrust of the formal health care system created challenges in mobilizing the people to take the vaccine. [USA\textsuperscript{25}]
  - Inequity and lack of transparency in the vaccine allocation process for disadvantaged communities created challenges of sufficient vaccine availability for socially marginalized populations. [USA\textsuperscript{25}]

**Enablers**
- Forming and leveraging partnerships with groups/people who have an existing relationship, rapport and trust of the target population [USA\textsuperscript{17}]
- Consistent engagement and frequent presence of the clinic/team with the community [USA\textsuperscript{17}]
- Serving everybody who came to the clinic and not turning them down propagated trust within the community [USA\textsuperscript{17}]

**At vaccination**
- Cultural and language barriers create differences in the way the disease is explained, and in the rapport of doctor–patient relationship. [USA\textsuperscript{17}, USA\textsuperscript{25}]

**Lessons learned**
- Mobile vaccination clinics typically employ varied community mobilization strategies to bring in people to the clinics for vaccination.
Fixed-post vaccination sites required the least amount of spatial adaptation because they are purpose-built, however, mobilization is critical.

### Pre-vaccination/mobilization

- **Strategies**
  - IEC campaigns with a difference
  - Contextually relevant communication [SA22]
  - Risks vs benefit approach to adverse event (AE) discussions [SA22]
  - Targeted messaging [USA10], high frequency education and communication efforts tailored for target communities, parents and family (for students) [USA8, USA9]
  - One-on-one counseling for real-time update on vaccine effectiveness for under-represented groups in clinical trials [England2]
  - Declination forms for awareness of consequences of not taking the vaccine [USA1]
- **Engaging vaccine champions and opinion leaders to advocate for the vaccine**
  - Medical and political leadership at the forefront in active conversations with target populations [Engald3, USA1, USA2, USA9]
  - Leveraging community voices and radically diverse viewpoints for consensus-building [USA19], dispel myths, misconception, and rumors
- **Practical appointment systems reduced barriers to accessing the vaccine**
  - Walk-ins for those with no pre-plans of taking the vaccine/missed appointments [SA22, England2]
  - Multi-lingual appointment portals to overcome language barrier [USA10]

### At vaccination

- **Strategies**
  - Incentives (financial/non-financial) for encouraging vaccine uptake [USA1, USA2, USA8, USA10]
  - Flexibility in the parental consenting process for students through online or over-the-phone provisions [USA9]

<table>
<thead>
<tr>
<th>Lessons learned</th>
<th>Challenges</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| **Pre-vaccination/mobilization** | • Distrust of the fast-paced vaccine development [USA1] and historical distrust in the formal health care system [USA10]  
• Logistical constraints for vaccines with short shelf life [USA12]  
• Lack of timely data on COVID-19 vaccine safety and efficacy for pregnant women [England2]  
• Long waiting time during the early phase of the pandemic [SA22] | • Identifying people facing barriers and removing barriers to access by arranging transportation, providing internet for booking, and offering walk-ins. [USA10] |
| **At vaccination** | • Language barriers in understanding vaccine information sheets and consent forms for non-English speaking populations [USA8] | • Partnerships with the private sector for efficient vaccine sourcing, staffing, running data systems, etc. [USA10, USA9]  
• Partnerships with community and civil society organizations to mobilize human resource support for vaccine distribution and operations management. [USA9] |
Summary of challenges and potential solutions, by delivery model, as seen in this review

<table>
<thead>
<tr>
<th>S/N</th>
<th>Challenge</th>
<th>Potential Solution</th>
<th>Delivery Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-vaccination/mobilization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Difficulty in prioritizing patients based on risk levels (South Africa)</td>
<td>Creation of a database with history/risk levels of those expected to take the vaccine at the facility</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Barriers to appointments, especially for socially vulnerable populations (South Africa)</td>
<td>Option for walk-in shots (SA, England), flexible appointment bookings by scanning QR code (USA), appointment by invitation (USA), arranging internet access for those who need it</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Cultural and language barriers in securing appointments and navigating vaccine clinics (USA, USA)</td>
<td>Multilingual and special needs app for those who don’t speak the common language (Germany, USA),</td>
<td></td>
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<tr>
<td>4.</td>
<td>Myths, misconceptions, and mistrust in formal health system/the vaccine (USA, Berry, USA, USA)</td>
<td>Deliver IEC through trusted channels (USA), organize community catalyzing events with a variety of stakeholders (USA), maintain repeated clinic presence to build trust in the community (USA), work with trusted partners who have a rapport with community (USA), provide COVID-19 vaccine as integrated service with other essential services (USA), offer incentives—cash/in-kind (Berry, USA, NASN)</td>
<td></td>
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<tr>
<td>5.</td>
<td>Inequity in vaccine allocation (USA)</td>
<td>Strong advocacy for vaccine availability irrespective of insurance status, immigration status, etc. (USA)</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Lack of info on COVID-19 vaccine for pregnant women (England)</td>
<td>Q&amp;A sessions with leadership of OB/GYN and midwifery departments, one-on-one counselling of real-world vaccine efficacy data (England)</td>
<td></td>
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<tr>
<td></td>
<td>At vaccination</td>
<td></td>
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<tr>
<td>7.</td>
<td>Logistics—timely coordination of vaccines (USA)</td>
<td>Interactive vaccine dose prediction sheet to coordinate stock, need, etc. (Italy)</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Challenges in consenting process (USA)</td>
<td>Allow consenting over phone (USA), multilingual app providing translation of consent form (Germany)</td>
<td></td>
</tr>
</tbody>
</table>
Key service delivery challenges and learnings related to priority populations, as seen in this review

<table>
<thead>
<tr>
<th>S/N</th>
<th>Priority population</th>
<th>Challenge</th>
<th>Learnings</th>
<th>Delivery Model</th>
</tr>
</thead>
</table>
| 1.  | Health care workers | • Distrust of vaccine-development process  
• Myths, misconception, and rumors | • Frequent, relevant IEC efforts to address doubts on rumors and misconceptions, and clarification on the rigor and legitimacy of the vaccine development process |  |
| 2.  | Elderly people      | • Age-related illnesses and mobility issues making it difficult to navigate the mass vaccination site | • Unify history-taking and inoculation steps to reduce inconvenience and time spent (Italy) |  |
| 3.  | Pregnant women      | • Lack of clear guidance on vaccinating pregnant women due to non-inclusion in clinical trials resulting in concerns about safety and risk of vaccinating pregnant women (England) | • Counseling and service delivery should be by providers women regularly interact with (England)  
• Update and disseminate real-time data and insights on COVID-19 vaccine safety and efficacy for pregnant women |  |
| 4.  | Socially marginalized populations (injecting drug users [IDU], undocumented migrants, traditionally vaccine-hesitant people, etc.) | • Distrust in the formal health care system  
• Myths, misconception, and rumors  
• Language and cultural barriers  
• Barriers to access owing to geographic, racial and ethnic marginalization | • Approach IEC campaigns with utmost sensitivity  
• Targeted messaging addressing concerns to the population (USA, USA)  
• Provide COVID-19 vaccine as an add-on service with other services of interest to the community (England, USA)  
• Provide incentives (cash/in-kind) (Berry, USA)  
• Provide walk-in options (USA)  
• Address social determinants of health, which restrict access (lack of transportation, internet access for bookings, etc.) (USA) |  |
Examples of COVID-19 vaccine integration as seen in this review

<table>
<thead>
<tr>
<th>S/N</th>
<th>Target Population</th>
<th>Integration</th>
<th>Delivery Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Injecting drug users</td>
<td>Point of care tests for HIV, syphilis, and Hep C, and needle exchange programs along with COVID-19 vaccines (USA\textsuperscript{17})</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Pregnant women</td>
<td>COVID-19 vaccines with ultrasonograms and check-ups in antenatal clinics (England\textsuperscript{3})</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Students</td>
<td>COVID-19 vaccines with flu-vaccine shots (USA\textsuperscript{10})</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>General population</td>
<td>COVID-19 vaccines offered at blood donation camps (Israel\textsuperscript{16})</td>
<td></td>
</tr>
</tbody>
</table>
Key findings from the literature and recommendations

**Adaptations**

Tweaks to early pandemic phase strategies are needed today

- Requiring pre-visit visit appointments is no longer necessary with more vaccine supply available. Mobilization messages should emphasize walk-in are welcome.
- Risk/benefit messaging for AE following immunization concerns was fit for the early phase. Today’s messaging should address falling risk perception and vaccine confidence.
- Pursue partnerships—community volunteers, students (nursing, pharmacy, or medical students)—for extra hands; private sector for logistics support.
- Tailored communication is required. Strategies and messaging should address current concerns, be evidence-based and frequent.

**Demand generation**

Multidisciplinary collaboration and confidence building approaches are key to drive uptake

- Programs should invest in interpersonal communications, e.g., one-on-one conversations for some groups with high distrust of the health care system.
- Programs should cultivate leaders and influencers—medical, political, religious, community leaders—as champions for vaccination.
- Communication strategies should engage diverse voices with the goal of building consensus, not just to convince.
- For priority and socially marginalized populations, invest in trust-building and provide tailored approaches, like incentives, add-on/ integrated services, push delivery.

**Limitations and next steps**

**Limitations**

Gaps in literature warrants contextualization of findings

- Most studies were done in the early part of the global COVID-19 vaccine roll-out when cases were rising, vaccine supply was short, and demand for shots was high.
- Most studies were from high-income countries, so literature review findings should be contextualized and strategies adapted for low- and middle-income country (LMIC) settings.
- More studies from LMICs are needed. Global partners should support LMIC researchers to document and share their lessons learned.
- Update literature review in the future when more countries have published their experiences.

**Targets of recommendations**

- Immunization community
- Country programs
- Global/regional partners/donors
- Researchers
Appendix
Theory of change: Elements of the COVID 19 vaccine deployment, delivery and demand

Geo-political, economic, epidemiological, and health systems context

Leadership and governance
- Political will
  - Coordination
  - Planning
  - Performance management/monitoring & evaluation

Operational inputs for service delivery
- Financing
- Bundled COVID-19 vaccines supply: quantity and type
- Cold chain adequacy and penetration
- Vaccine & vaccination data, disease surv. & AE following immunization monitoring systems
- Health workers availability, skill, and motivation
- First and last mile logistics for vaccine and service delivery
- Behavior change communication and interventions

Intermediate outcome
- COVID vaccine services available, assessable, and convenient
- Positive norms, confidence and trust about COVID-19 vaccination
- Intention to uptake COVID-19 vaccination

Program outcome
- Increase in COVID-19 vaccine coverage and utilization
- Reduction in COVID-19 vaccine wastage

Color key
- Context
- Supply side
- Demand side
- Outcome
## Overview of study design, countries, and data sources

<table>
<thead>
<tr>
<th>Study Design</th>
<th>No. of Studies (N=25)</th>
<th>Countries</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case studies</td>
<td>7</td>
<td>USA (4), Italy (1), Israel (1), China (1)</td>
<td>Program implementation process data (4), facility registers (2), secondary sources (websites) (1)</td>
</tr>
<tr>
<td>Observational study (1 time assessment, no control group)</td>
<td>5</td>
<td>USA (4), Italy (1)</td>
<td>Web-based survey (1), state database (1), facility registers (2)</td>
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<tr>
<td>Pre – post study</td>
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<td>England (1)</td>
<td>Facility registers (1)</td>
</tr>
<tr>
<td>Retrospective program evaluation</td>
<td>7</td>
<td>USA (4), Malta (2), South Africa (1)</td>
<td>Facility records (2), primary qualitative data (2), government database, published research reports, internal reports (2), grey sources: newspapers, websites (1)</td>
</tr>
<tr>
<td>Cluster randomized trial</td>
<td>1</td>
<td>USA (1)</td>
<td>Electronic medical record (1)</td>
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<tr>
<td>Others (integration ideas, lesson learned from an open-label study, app pilot testing)</td>
<td>4</td>
<td>Israel (1), South Africa (1), Germany (1), Sudan (1)</td>
<td>E-registries (1), program implementation process data (1), unspecified (1)</td>
</tr>
</tbody>
</table>
Number of studies*: Delivery models and target population

<table>
<thead>
<tr>
<th>Target population</th>
<th>Mass vax</th>
<th>Mobile vax</th>
<th>Fixed vax – health care settings</th>
<th>Fixed vax – non health care settings</th>
<th>System-level delivery insights</th>
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<tbody>
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<td>HCW</td>
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<td>Pregnant women</td>
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<tr>
<td>Students &amp; affiliates</td>
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<td>Socially marginalized pop (e.g., IDU)</td>
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<td>8</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

*Some papers reported more than 1 model. Hence, the row and column totals don’t add up to 25
<table>
<thead>
<tr>
<th>S/N</th>
<th>Author_Year</th>
<th>Country/s of study</th>
<th>Geographic setting</th>
<th>Health care context</th>
<th>Implementer</th>
<th>Study design</th>
<th>Scope of intervention</th>
<th>Target age group</th>
<th>Target population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Berry_2022</td>
<td>USA</td>
<td>Rural</td>
<td></td>
<td></td>
<td>Observational study (no control group) with only one time assessment</td>
<td></td>
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<td>Specific occupational group</td>
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<td>2</td>
<td>Berry_2022</td>
<td>USA</td>
<td>Others (e.g., workplaces, educational institutes, markets, supermarkets, social gathering, worship centers)</td>
<td>Private</td>
<td>Intervention and control group with random assignment</td>
<td>Pilot</td>
<td>Adults</td>
<td>Nursing home residents</td>
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</tr>
<tr>
<td>3</td>
<td>Cater_2022</td>
<td>England</td>
<td>Rural</td>
<td>Tertiary, community</td>
<td>Public</td>
<td>Pilot before and after study</td>
<td>Pilot before and after study</td>
<td>Young adults 18–24, young professionals 25–34, adults 35–49, older adults 50–64</td>
<td>Pregnant &amp; lactating women</td>
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<tr>
<td>4</td>
<td>Cuschieri_2021</td>
<td>Malta</td>
<td>Urban &amp; islands</td>
<td>Tertiary, community</td>
<td>Public</td>
<td>Retrospective program evaluation</td>
<td>Routine national</td>
<td>Adults</td>
<td>General population</td>
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<td>Tertiary, community</td>
<td>Public</td>
<td>Retrospective program evaluation</td>
<td>Routine</td>
<td>Adults</td>
<td>Specific occupational group: HCWs, community pharmacy staff, teachers, elderly (+60y), medically vulnerable groups</td>
</tr>
<tr>
<td>6</td>
<td>Martinez_2022</td>
<td>United States (Mexico border counties)</td>
<td>Urban</td>
<td>Community</td>
<td>Public</td>
<td>Retrospective program evaluation</td>
<td>Routine sub national</td>
<td>Adults</td>
<td>General population</td>
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<td>S/N</td>
<td>Author_Year</td>
<td>Country/s of study</td>
<td>Geographic setting</td>
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<td>Primary</td>
<td>Private</td>
<td>Observational study (no control group) with only one time assessment</td>
<td>Pilot</td>
<td>Pregnant &amp; lactating women</td>
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<td>Urban</td>
<td>Community</td>
<td>Public</td>
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Thank you