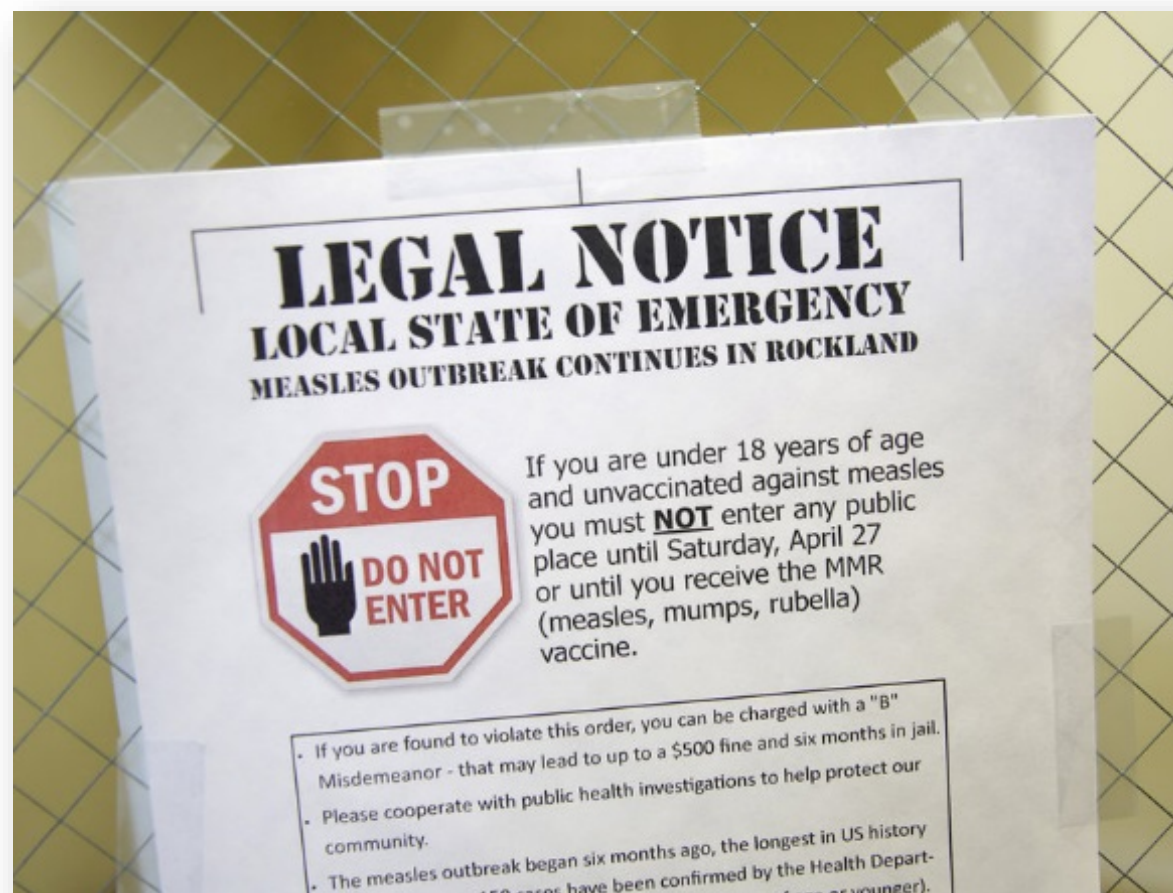


# Responding to an “Eliminated” Infectious Disease: A Case Study



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Chief Medical Officer  
Refuah Community Health Collaborative

**June 13, 2019**  
**Commissioner's Grand Rounds**

# Disclosures

**No conflicts of interest to declare**

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# Phase 1: The First Six Hours

**"The entire time I was thinking - am I overreacting or underreacting?"**

Caithleen Zikorus, MSN, FNP-C

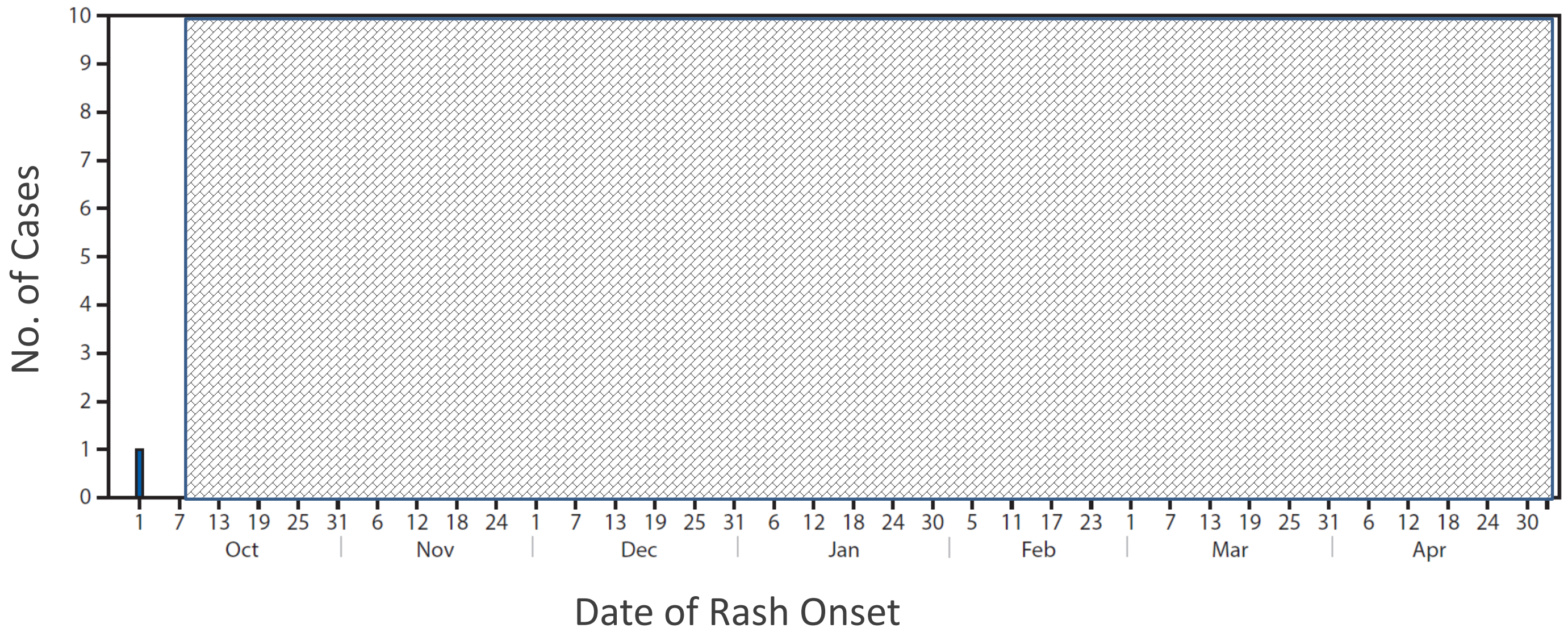
## Immediate First Steps:

1. Activated Refuah's emergency response team
2. Immediately reported suspect case to Health Department
3. Infection control – shut down areas of shared airspace for 2 hours

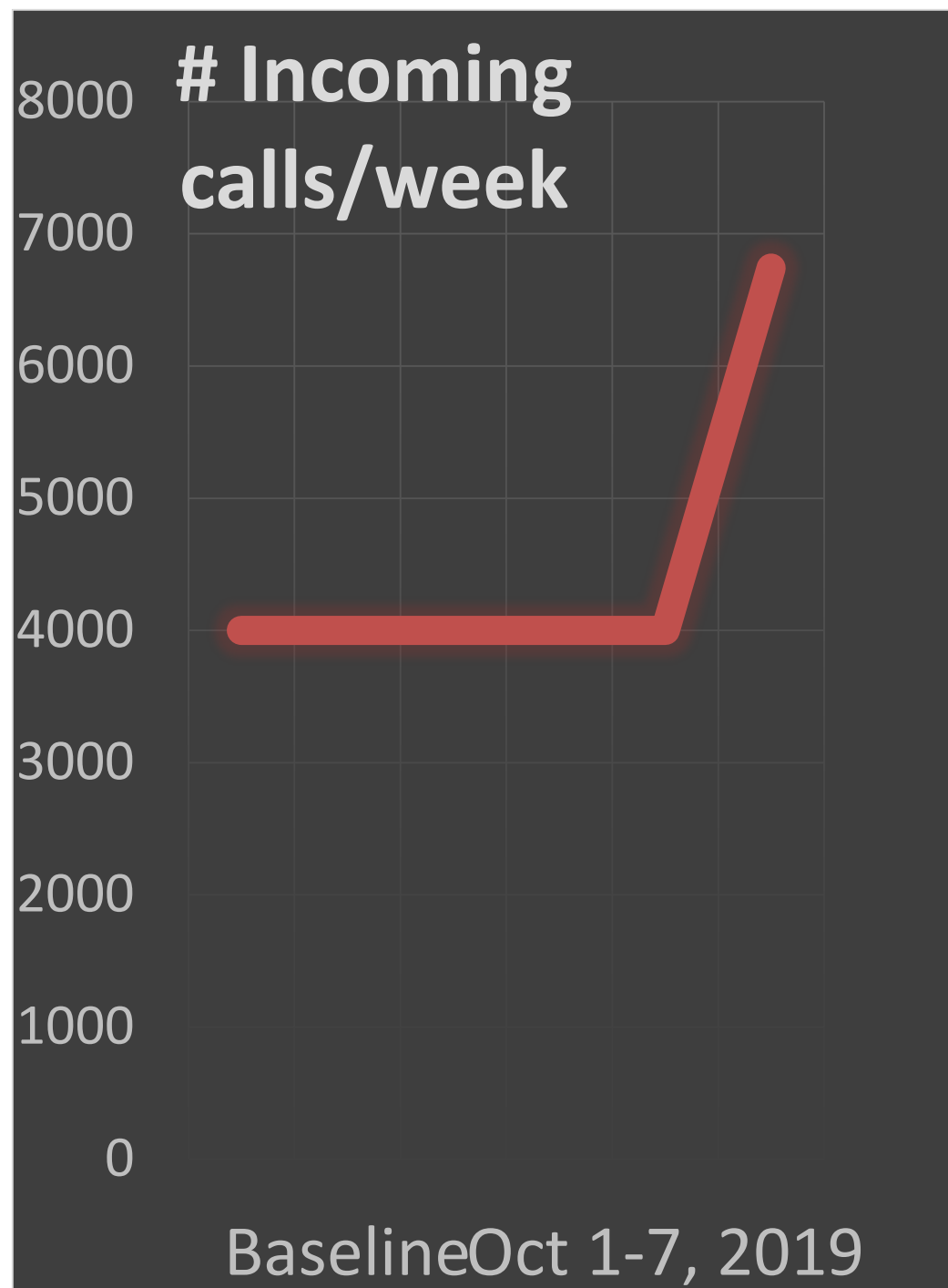


# Phase 2: The First Six Days

Histogram: # of Measles Cases by Date of Onset



# Immediate Impact Across the Health Center



- Call center volume jumped from 4,000 to 6,700
- Staff anxiety already mounting
- Immediate need to develop post-exposure prophylaxis (PEP) protocols and capacity
- Struggle to prepare for an unknown number of secondary cases ranging from 0 to 7,000+

# Initial Response

Educate. Communicate. Educate. Communicate.

- Opening phone message:

***“...If you have received 2 MMR vaccines, you do not need to take further action.... If you’re not sure, press 1 to check your status....”***

- Hired developer to enable automated phone verification of vaccine status 24H a day
- Vaccine verification system was accessed by over 2,800 families





# First Staff/Patient Infographic

## MEASLES

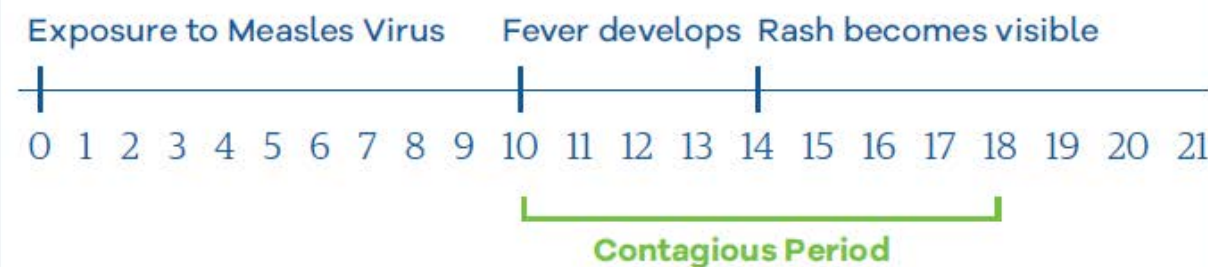
### Taking a closer look



*Vaccination is the best prevention against Measles*

Measles is marked by fever followed by a classic red, splotchy rash that begins on the face at the hairline, and then spreads all over the body. Initial symptoms can also include low energy, loss of appetite, stuffed nose, runny or red eyes, and cough. Occasionally complications can develop, like diarrhea, ear infection, pneumonia, or in rare cases even death. Measles has also been associated with premature labor, pregnancy loss, and birth defects.

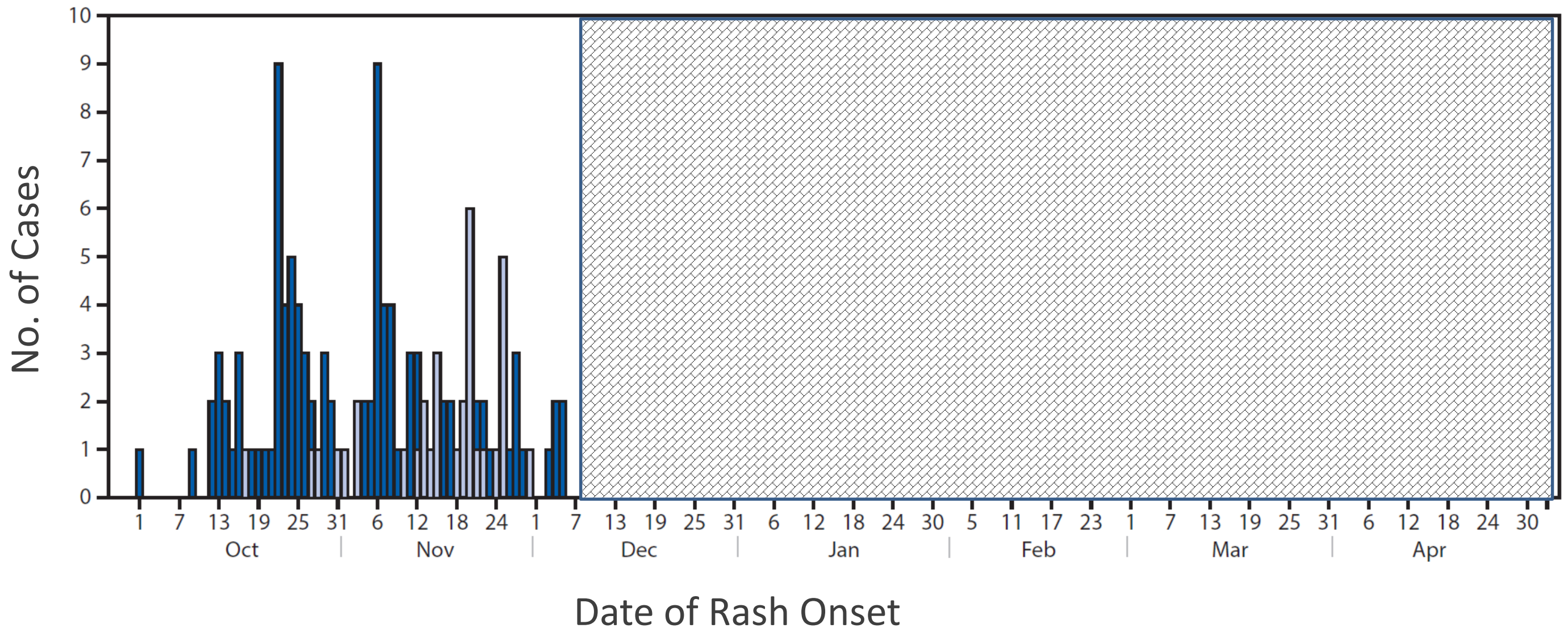
#### Typical Measles Timeline:





# Phase 3: The Next Six Weeks

# of Measles Cases by Date of Onset



McDonald R, et al. MMWR Morb Mortal Wkly Rep 2019;68:444–445.

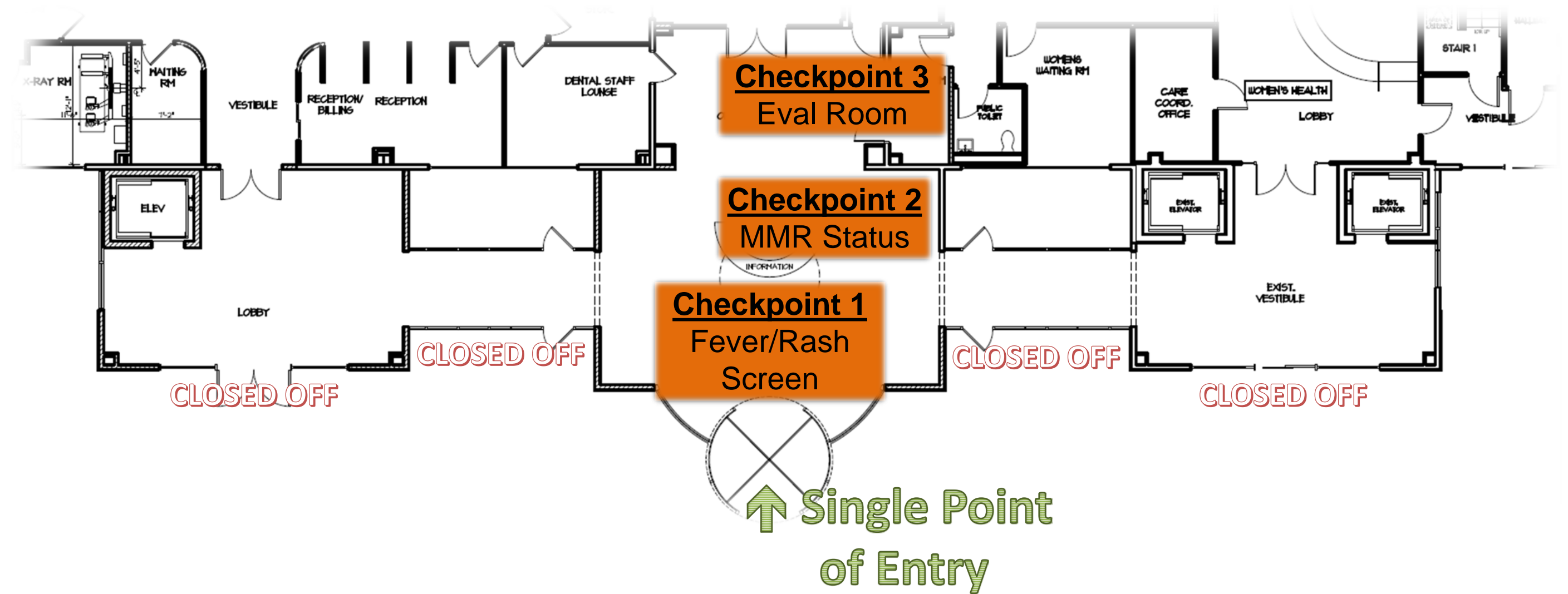
# Building In-House Subject Matter Expertise

## A Single Measles Resource

- Single point of contact R-A-S-H (ext 7274) cell phone line
- Staffed by few highly trained providers armed with the latest DOH updates
- Available 24/7
- Fields all measles related questions
- Centralized source of reporting to DOH
- Trends more easily identified



# Front Door Triage



- All visitors screened
- Unvaccinated individuals with fever are masked and roomed immediately
- Patients with rash/ill-appearing promptly seen in nearby converted “eval room”



# Other Exposure Mitigation Strategies



## Home Visits

- Patients calling to schedule an appointment for febrile rash are instead offered a home visit

## Newborns

- Babies <6 months ineligible for vaccine seen on a mobile unit parked outside
  - First half of the day used for well visits
  - Second half of the day used for sick visits



# Public Health Engine

- Set up outreach robocalls to patients missing one or more MMRs in EMR
- Parked “vaccination mobiles” in the community
- **Administered 3,000 MMRs in first 6 weeks of the outbreak**





# Community Broker



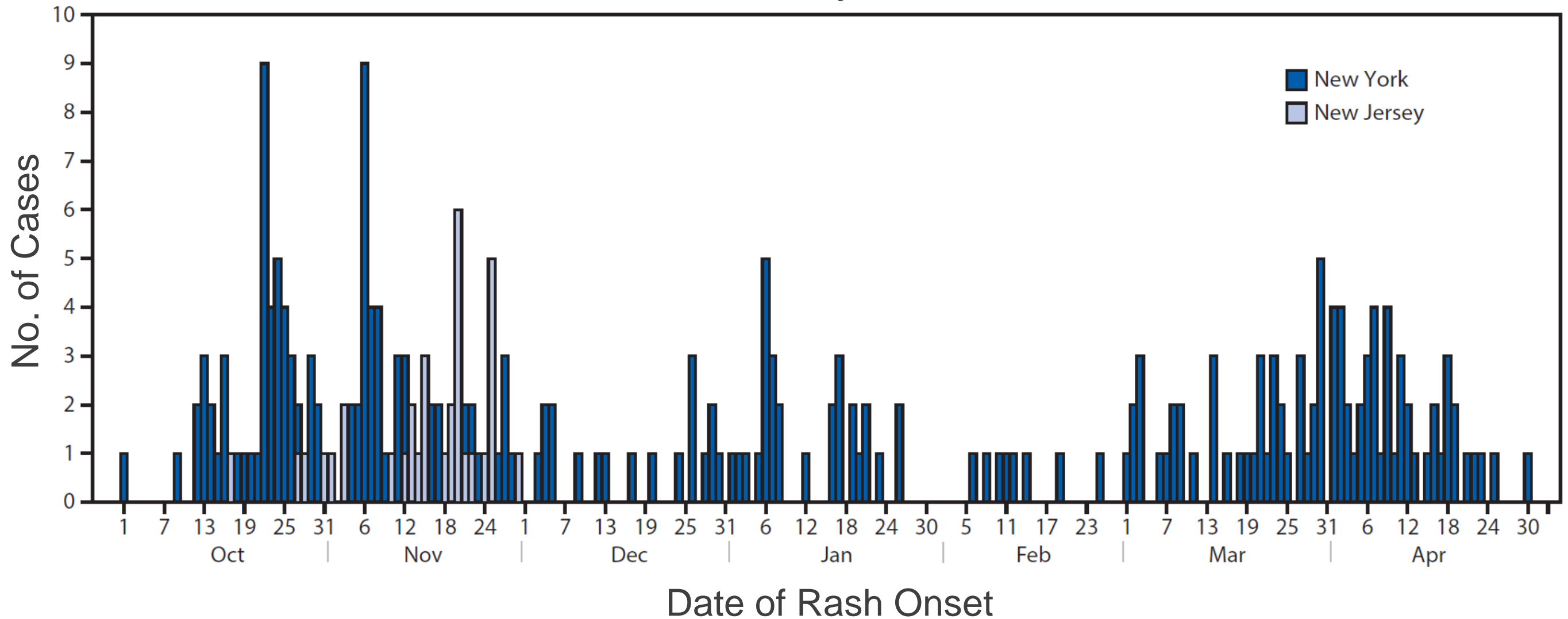
- Arranged community stakeholder meetings and focus groups with DOH, CDC, religious and community, leadership, etc.
- Circulated pro-vaccine letter authored by Rabbi Moshe Sternbuch, Chief Rabbi of the highest Orthodox Rabbinical Court in Jerusalem:

*...Every parent is obligated to vaccinate his sons and daughters. No father may deprive them of the protection of the vaccination, especially since to do so is damaging to others....*



# Phase 4: The Last Six Months

# of Measles Cases by Date of Onset



# Changing Course for the Future

**What do we need to change?**

**What does the evidence show?**

- National expert on vaccine hesitancy, Mayo Clinic's Dr. Robert Jacobson, brought in to train staff and inform strategy



# 1. Education Alone Doesn't Work

## PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

### Effective Messages in Vaccine Promotion: A Randomized Trial

Brendan Nyhan, Jason Reifler, Sean Richey and Gary L. Freed

*Pediatrics* 2014;133:e835

DOI: 10.1542/peds.2013-2365 originally published online March 3, 2014;

Nyhan surveyed 1760 patients on their vaccine attitudes and practices before and after they were randomized to one of 4 interventions or control

1. Scientific evidence

2. Adverse events of diseases

3. Graphic Images

4. Dramatic narrative

5. Control

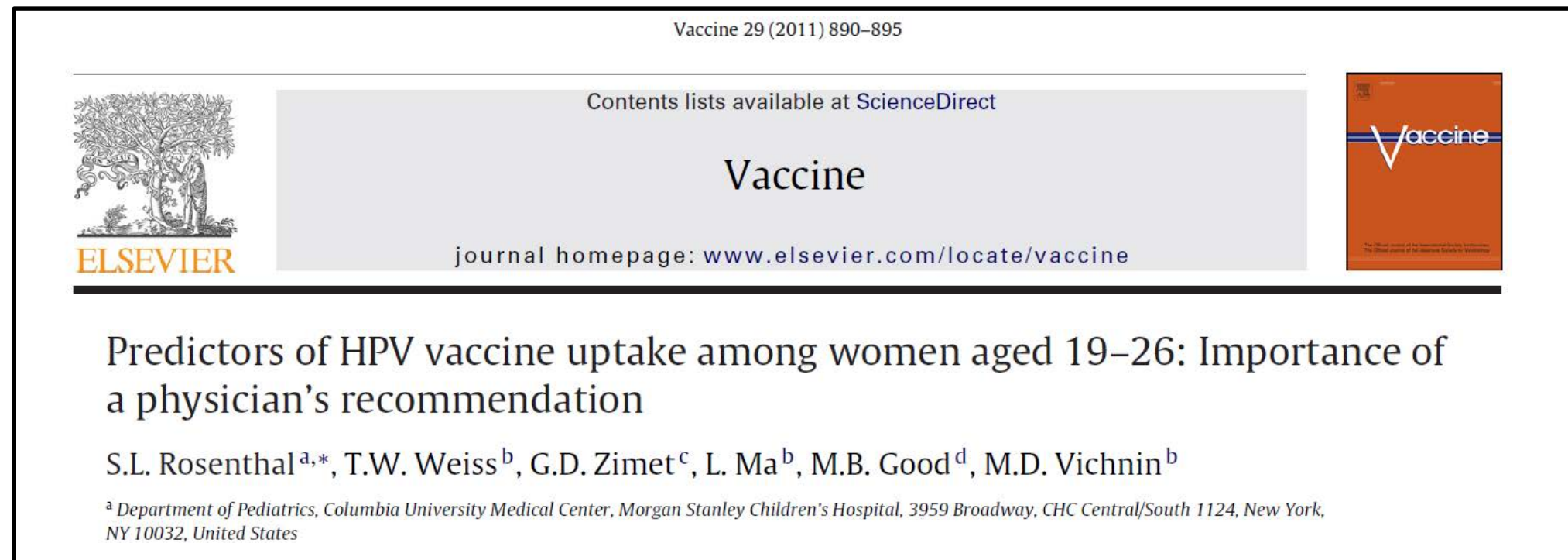
Conclusions:

**1. NO intervention increased intent to vaccinate**

2. Among parents with the least favorable attitudes toward vaccines, corrective information *decreased* intent to vaccinate



## 2. Clinician's Recommendations Matter

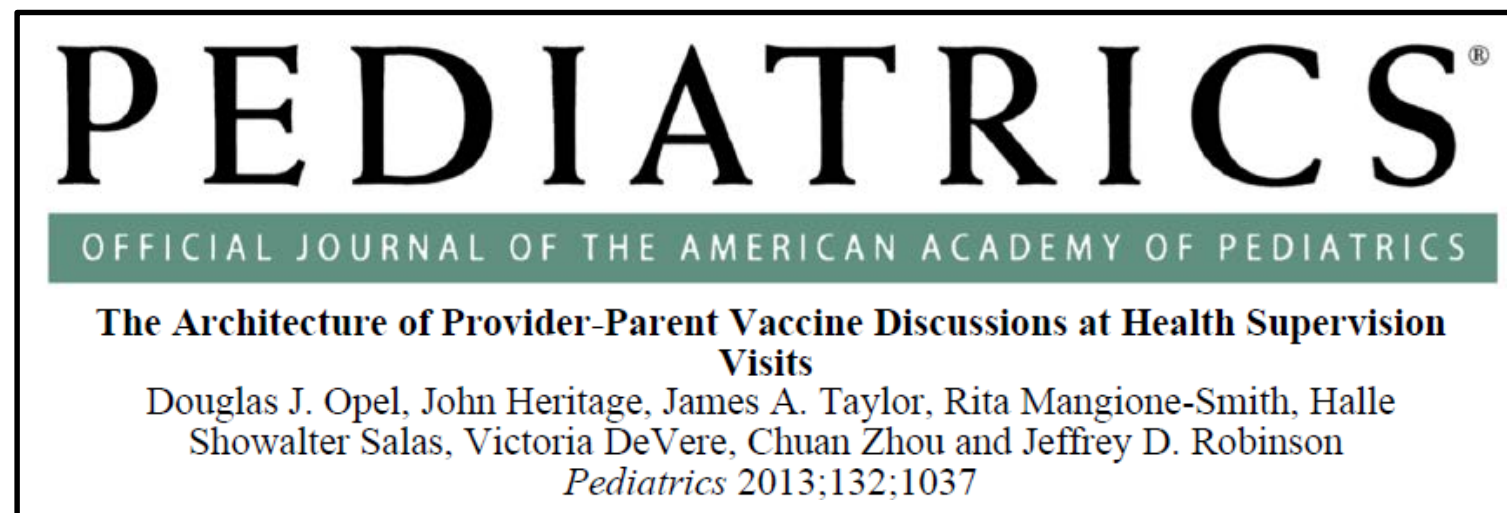


Rosenthal surveyed 2750 young women on whether their physician recommended the HPV vaccine and, if yes, “how strongly”

Conclusions:

- 1. Those who received a recommendation were overwhelmingly more likely to be vaccinated**
2. A strong recommendation led to a 4-fold greater likelihood of vaccination than a weak one

### 3. Presumptive Language is Key



Opel recorded 110 infant well visits and coded language used by provider when initiating vaccine discussion into 2 categories:

**Presumptive**  
presupposes parent would vaccinate

- “Well, we have to give some shots.”
- “So, we’ll do 3 shots and the test. Is this ok?”

**Participatory**  
parent presented with a decision to make

- “What do you want to do about shots?”
- “Are we going to do shots today?”

Conclusions:

- 1. Odds of vaccination were 17.5 fold higher with presumptive language**
2. Nearly half of initially resistant parents accepted original vaccine recommendation when provider persisted

# Takeaways

1. Education and scare tactics alone don't work; they can even backfire.
2. Clinician's recommendations matter. A stronger recommendation has a greater impact.
3. Presumptive language is much more effective than participatory language. Persistence pays off.



**Q:** If it's all the parent will accept, wouldn't giving at least one vaccine be better than nothing?

**A:** *"I tell parents it would be malpractice for me to pick only one vaccine of all that are due... Asking me to pick implies some are optional."*

- Robert Jacobson, MD, FAAP



# From Theory to Action

“Every system is perfectly designed to get the results it gets”

-Don Berwick, MD and/or W. Edwards Deming

How should we change what we currently do?

How quickly can we do it?





# Organizational Change

- Set goal to measurably increase childhood vaccination rates
- Embarked on 3 successive “Rapid Cycle Improvement” series
- Identified key drivers of low vaccine rates
- Implemented 8 high impact action plans each with their own 30-60 day PDSA (Plan-Do-Study-Act) cycle

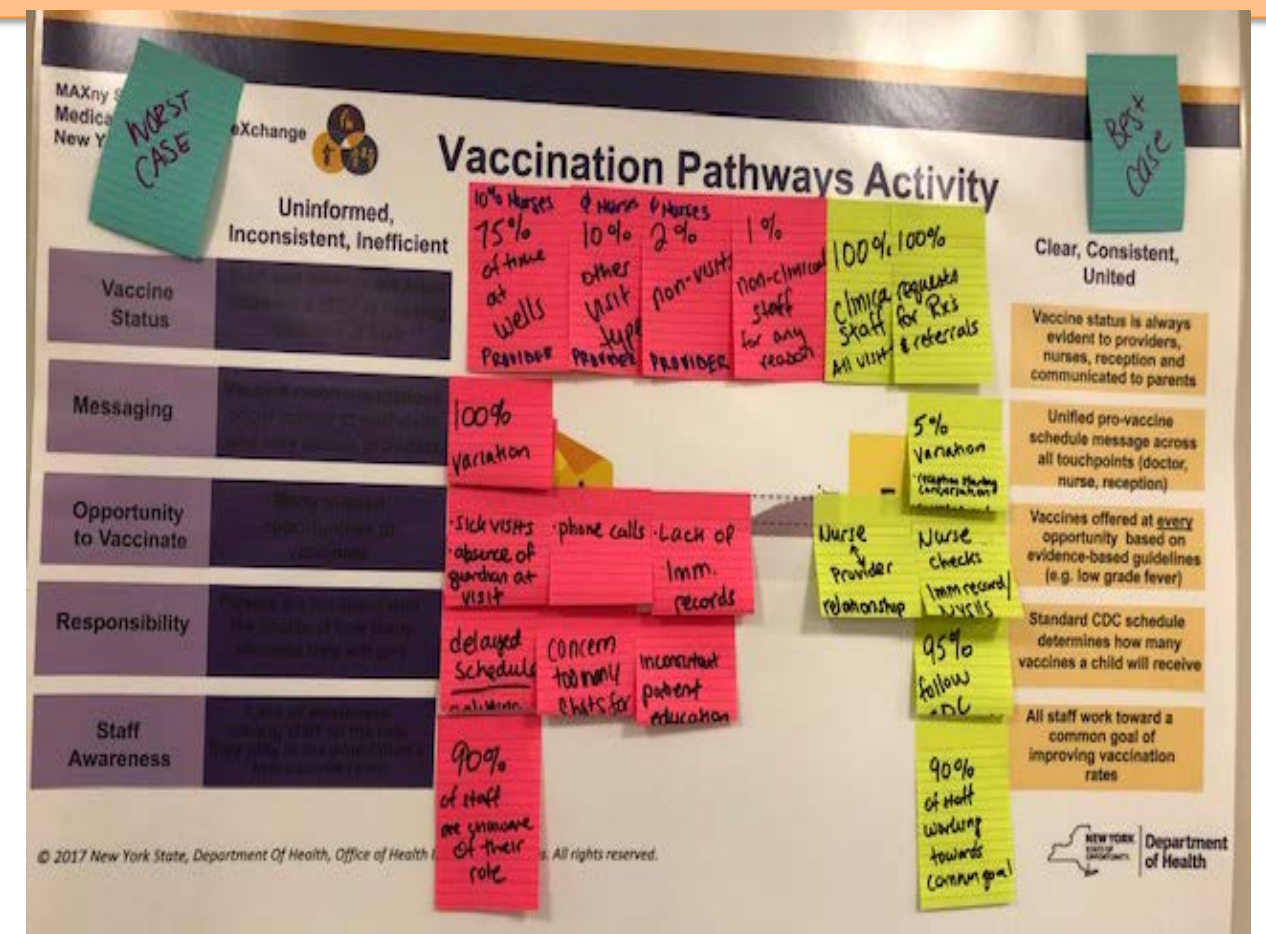


# Rapid Cycle Improvement (RCI)

“Rapid-cycle improvement is a quality improvement (QI) method that identifies, implements, and measures changes...over periods of 3 months or less”

HealthIT.gov  
**Key elements\*:**

- Team includes frontline to executive
- Uses change management techniques
  - Clear goal
  - Sense of urgency
  - Start with quick win
- Leverages multiple QI tools
  - Flow chart
  - Driver diagram
  - Process map
- Continuous measurement



\*Adapted from the NYS DOH “MAX” program

[https://www.health.ny.gov/health\\_care/medicaid/redesign/dsrip/pps\\_workshops/max.htm](https://www.health.ny.gov/health_care/medicaid/redesign/dsrip/pps_workshops/max.htm)

# Primary Drivers of Vaccine Hesitancy Identified

- 1) Perceived potential harm of vaccines greater than perceived risk of disease
  - e.g. misperceptions about “taxing the immune system”
- 2) Strong preference for “holistic” alternative therapies
- 3) Low perceived benefit of vaccine
  - e.g. MMR “failure” during mumps outbreak
- 4) Inconsistent strength of vaccine recommendation by health system




Source: [vaccineimpact.com](http://vaccineimpact.com)



# Resulting Action Plans

1. Make mission to vaccinate clear
2. One clear, consistent vaccine schedule; No more splitting/delay
3. Share provider vaccination rates; Support those struggling
4. Use EMR vaccine alert at every opportunity
5. Empower front line staff
6. Restructure vaccine delivery workflows
7. Engage specialty providers
8. Implement processes to eliminate loss to follow up

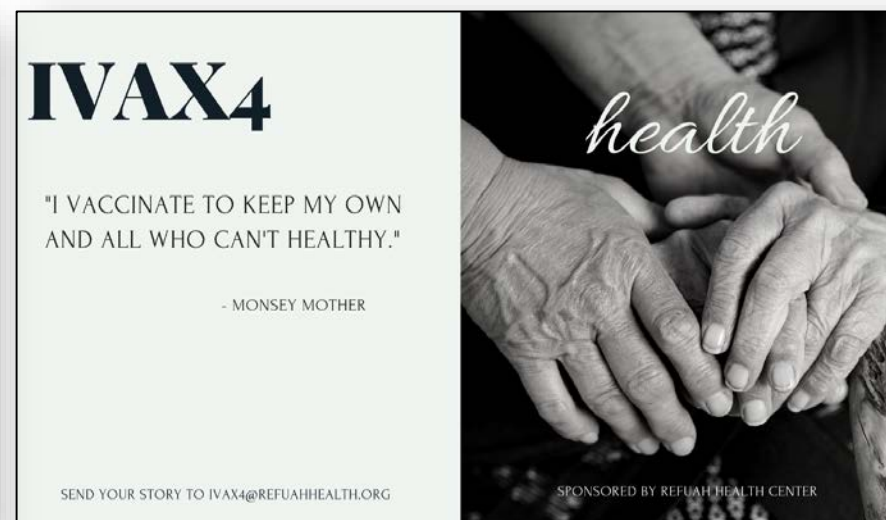


**IVAX4**

"I VACCINATE TO PROTECT YOUNG BABIES AND THE MEDICALLY FRAGILE."

- DR. ROSE VARON, MD, PEDIATRICIAN

SPONSORED BY REFUAH HEALTH CENTER  
SEND YOUR STORY TO [IVAX4@REFUAHHEALTH.ORG](mailto:IVAX4@REFUAHHEALTH.ORG)



**IVAX4**

"I VACCINATE TO KEEP MY OWN AND ALL WHO CAN'T HEALTHY."

- MONSEY MOTHER

SEND YOUR STORY TO [IVAX4@REFUAHHEALTH.ORG](mailto:IVAX4@REFUAHHEALTH.ORG)

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**IVAX4**

"I VACCINATE TODAY BECAUSE WAITING FOR AN OUTBREAK PUTS MY CHILDREN'S FUTURE AT RISK."

- NEW SQUARE MOTHER

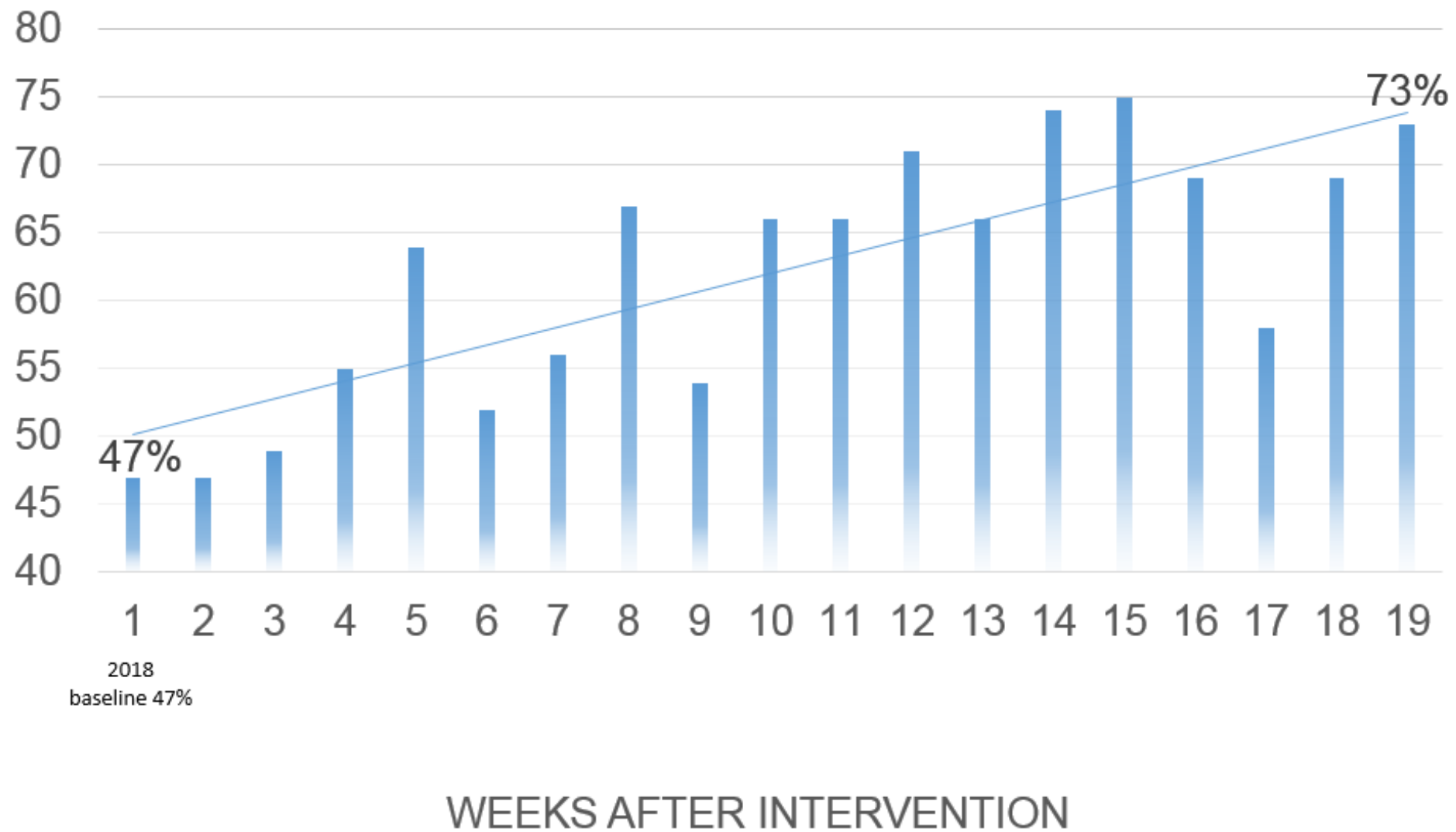
SEND YOUR STORY TO [IVAX4@REFUAHHEALTH.ORG](mailto:IVAX4@REFUAHHEALTH.ORG)  
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# Initial Results: Well Visit Vaccination Rates

## % OF ELIGIBLE VACCINES ADMINISTERED AT WELLS UNDER AGE 2

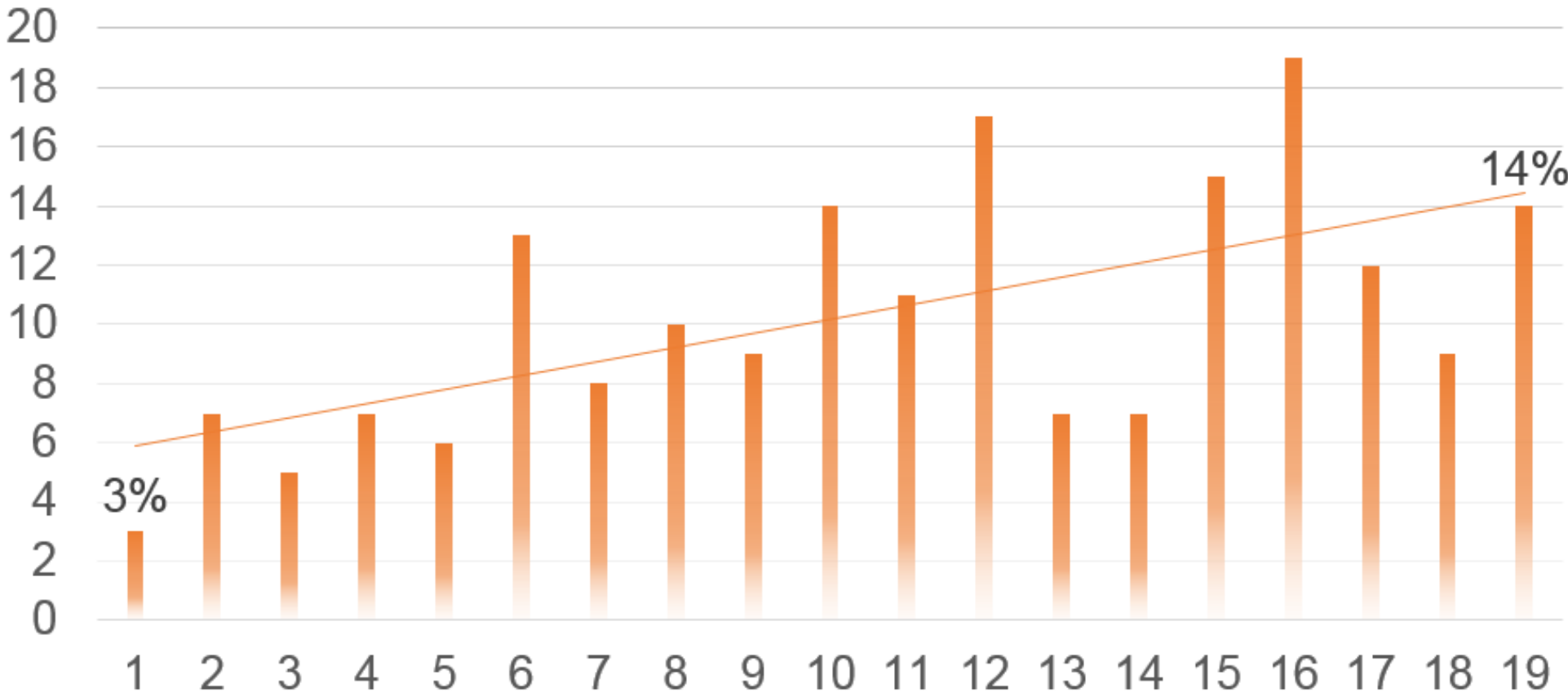
% OF ELIGIBLE VACCINES ADMINISTERED



# Initial Results: Non-Well Visit Rates

## % OF ELIGIBLE VACCINES ADMINISTERED AT NON-WELL VISITS UNDER AGE 2

% OF ELIGIBLE VACCINES ADMINISTERED



2018  
baseline 3%

WEEKS AFTER INTERVENTION

# Final Takeaways

## **1. Prepare and communicate more than you think you need to**

- Even with incomplete information
- Even to staff you think will be unaffected

## **2. Be nimble and adapt to an evolving situation**

- Don't be afraid to act quickly
- Innovate in the absence of standard practice

## **3. Build on existing knowledge**

- Know the evidence
- Take advantage of well-established quality improvement tools



Thank You