



# A MITRE RESPONSE TO THE NOVEL CORONAVIRUS OUTBREAK (COVID-19)

## **DELIVERING AN ENDURING NATIONAL RESOURCE FOR DISEASE CONTAINMENT AND MITIGATION**

National Association of Local Boards of  
Health (NALBOH) Town Hall

October 1, 2020

**MITRE** | SOLVING PROBLEMS  
FOR A SAFER WORLD™

# Today's Speakers

**Paul Jarris, MD, MBA**

Chief Medical Advisor

Sara Alert™ Project Leader

MITRE



**Oscar Alleyne, DrPH, MPH**  
Chief of Programs and Services

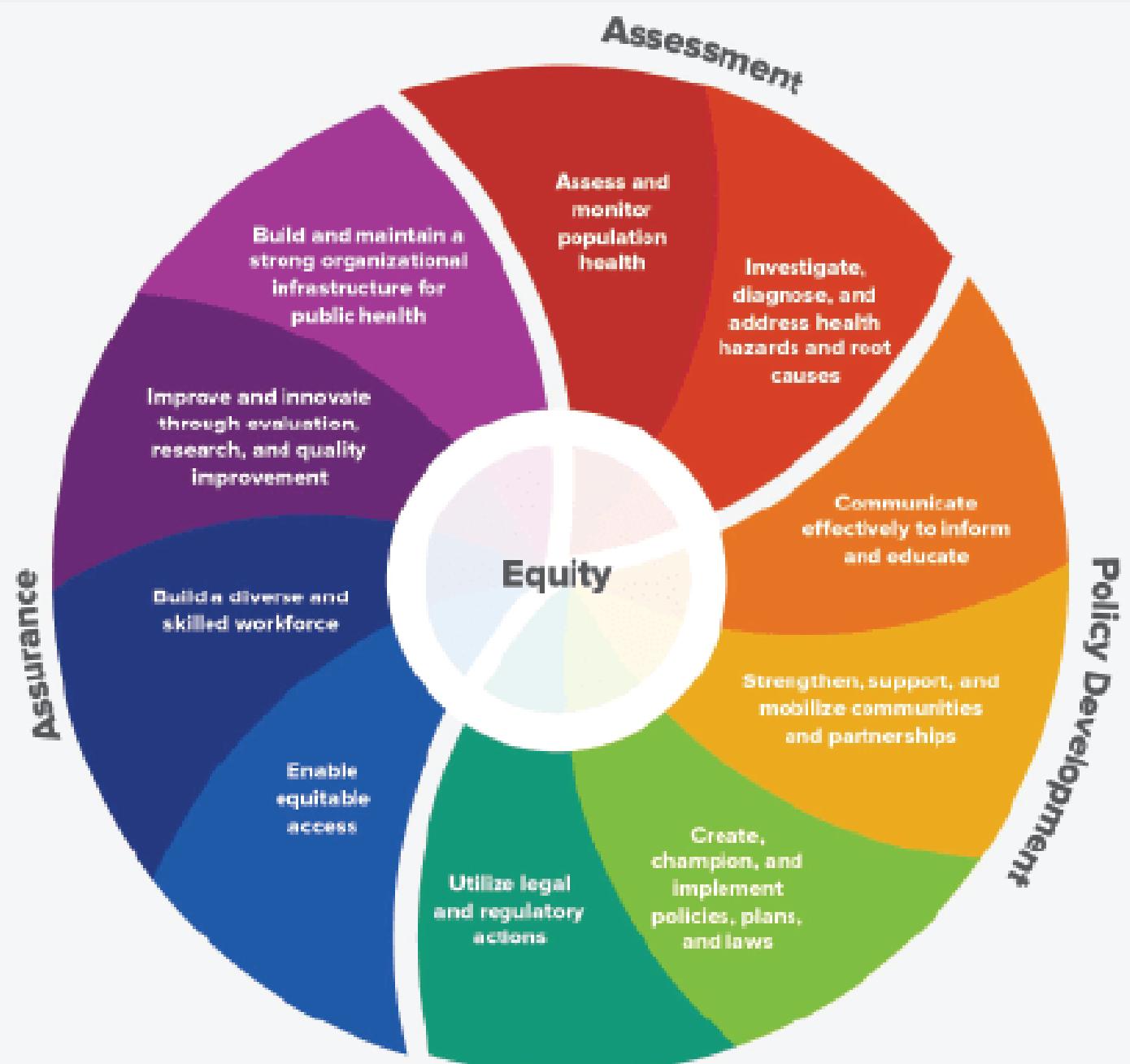
National Association of County  
and City Health Officials  
(NACCHO)



NACCHO is comprised of nearly **3,000 local health departments** across the United States with a vision of optimal **health, equity, and security** for all people in all communities.

Our mission is to improve the health of **communities** by **strengthening** and **advocating** for local health departments.

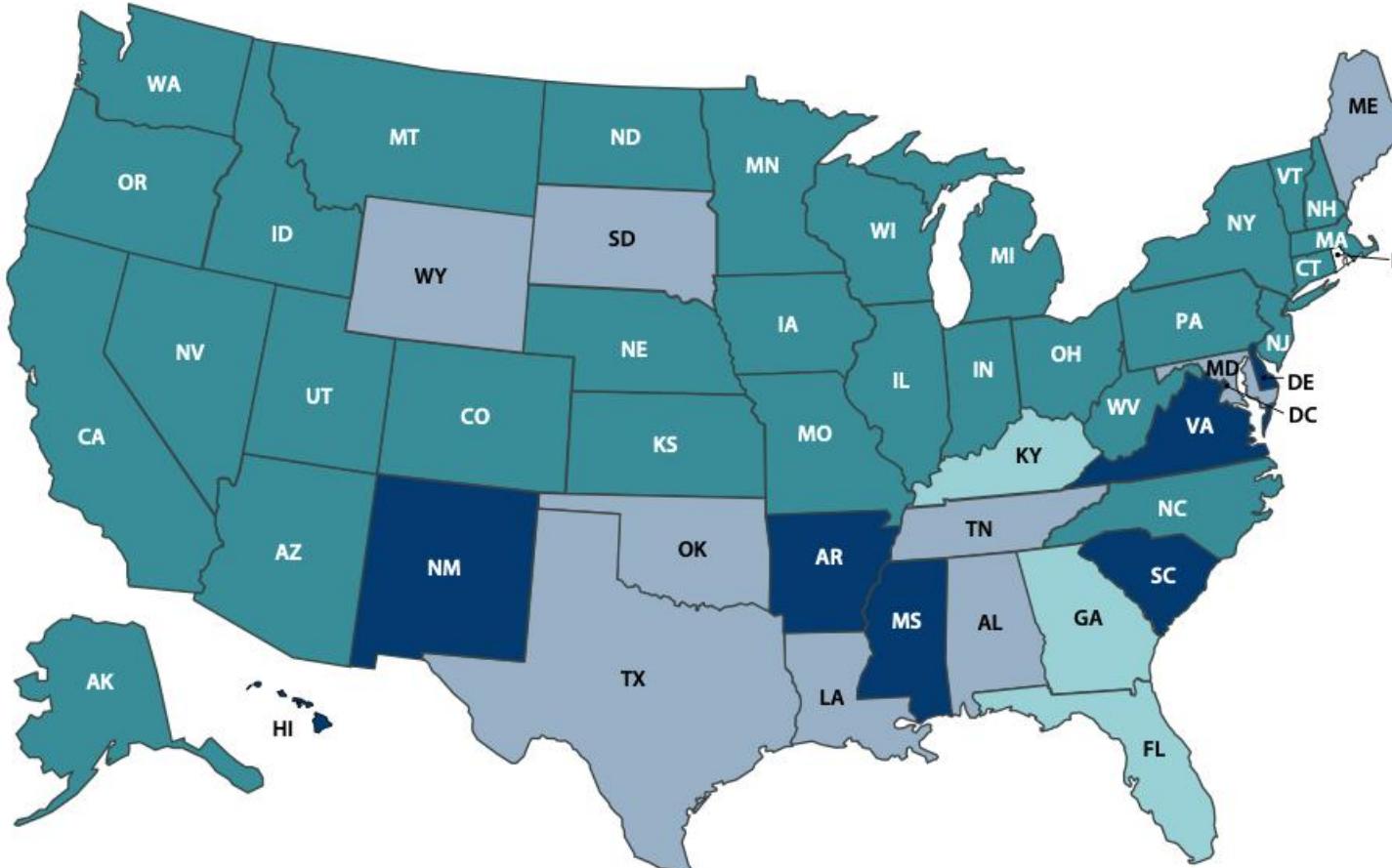
# The NEW 10 Essential Public Health Services



# Local Health Departments



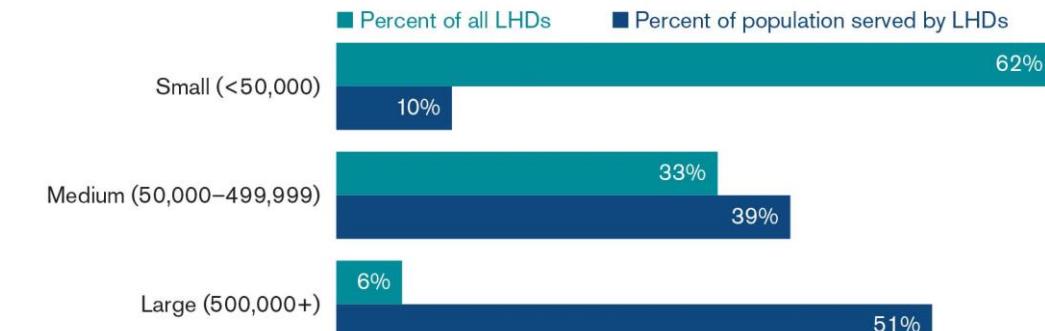
# Our Universe



RI was excluded from the study

N=2,459

## Percent of U.S. population served by LHDs



N=2,533

Source: National Association of County and City Health Officials (NACCHO) 2016 National Profile of Local Health Departments

## Early Public Health

In 1799, the first health department in America was formed (Boston Board of Health) to fight an outbreak of cholera. Its first President was Paul Revere.

In order to save lives, health officials posted signs on lampposts, held meetings and led an early-day public information campaign to reduce deaths.

Their authority also included penalties & fines

victim to suffering, for want of exerting the power which he possesses.

For J. RUSSELL'S COMMERCIAL GAZETTE.

### Board of Health.

*At a Meeting of the Board of Health, held at Boston the 26th day of June, 1799, a majority of the members being present, the following Votes, Rules and Regulations were passed.*

WHEREAS the Legislature of this Commonwealth, at their session in May 1799, by an Act, entitled "An Act, to empower the town of Boston, to choose a Board of Health, and for removing and preventing nuisances," did fully authorize and empower the said Board of Health, for the town of Boston, or a majority of them, from time to time, to make such Rules and Regulations, *to have effect within the limits of said town*, as to them should appear necessary, to prevent and remove nuisances and sources of filth, in their opinion injurious to the health of the inhabitants: and that any person or persons who should disobey any of them after the expiration of three days, from their publication in two of the public papers printed in said town, should be prosecuted, and on conviction thereof, in the manner pointed out by said law; forfeit and pay a fine of Five Dollars, together with cost. The Board of Health for the town of Boston, *in virtue of the said authority*, do now make, publish and declare the following Rules and Regulations, as the *Rules and the Regulations of the Board of Health for the town of Boston*, to commence and be in force within the limits of said town, from and after the expiration of three days, from their present publication; and any person or persons who shall not comply with them or either of them, will be prosecuted according to the provisions of the said Law; and



# Disease Reporting Norms

## Notifiable Disease Reporting

Anaplasmosis	Cryptosporidiosis	Pregnant hepatitis B carrier	Monkeypox	Staphylococcal enterotoxin B poisoning <sup>2</sup>
Amebiasis	Cyclosporiasis	Herpes infection, infants aged 60 days or younger	Mumps	Streptococcal infection (invasive disease) <sup>5</sup>
Animal bites for which rabies prophylaxis is given <sup>1</sup>	Diphtheria	Hospital associated infections (as defined in section 2.2 10NYCRR)	Pertussis	Group A beta-hemolytic strep
Anthrax <sup>2</sup>	E. coli O157:H7 infection <sup>4</sup>	Influenza, laboratory-confirmed	Plague <sup>2</sup>	Group B strep
Arboviral infection <sup>3</sup>	Ehrlichiosis	Legionellosis	Poliomyelitis	Streptococcus pneumoniae
Babesiosis	Encephalitis	Listeriosis	Psittacosis	Syphilis, specify stage <sup>7</sup>
Botulism <sup>2</sup>	Foodborne Illness	Lyme disease	Q Fever <sup>2</sup>	Tetanus
Brucellosis <sup>2</sup>	Giardiasis	Lymphogranuloma venereum	Rabies <sup>1</sup>	Toxic shock syndrome
Campylobacteriosis	Glanders <sup>2</sup>	Malaria	Rocky Mountain spotted fever	Transmissible spongiform encephalopathies <sup>8</sup> (TSE)
Chancroid	Gonococcal infection	Measles	Rubella	Trichinosis
Chlamydia trachomatis infection	Haemophilus influenzae <sup>5</sup> (invasive disease)	Melioidosis <sup>2</sup>	(including congenital rubella syndrome)	Tuberculosis current disease (specify site)
Cholera	Hantavirus disease	Meningitis	Salmonellosis	Tularemia <sup>2</sup>
Coronavirus (severe or novel) 2019 Novel Coronavirus (COVID-19)	Hemolytic uremic syndrome	Aseptic or viral	Shigatoxin-producing E. coli <sup>4</sup> (STEC)	Typhoid
Severe Acute Respiratory Syndrome (SARS)	Hepatitis A	Haemophilus	Shigellosis <sup>4</sup>	Vaccinia disease <sup>9</sup>
Middle East Respiratory Syndrome (SARS)	Hepatitis A in a food handler	Meningococcal	Smallpox <sup>2</sup>	Vibriosis <sup>6</sup>
	Hepatitis B (specify acute or chronic)	Other (specify type)	Staphylococcus aureus <sup>6</sup> (due to strains showing reduced susceptibility or resistance to vancomycin)	Viral hemorrhagic fever <sup>2</sup>
	Hepatitis C (specify acute or chronic)	Meningococcemia		Yersiniosis

**Workforce**

**Volunteers**

**Training**

**Capacity**

**Distribution**

**Supports & Services**



# MITRE Operates Federally Funded Research and Development Centers

## Solving problems for a safer and healthier world

MITRE is a private, independent, not-for-profit organization, chartered to work in the public interest

- **Created by government to address complex problems**
- **Analyzes problems with objectivity**
- **Does not develop commercial products or compete with industry**

Mission of the **Health FFRDC** is to accelerate health and human services innovation by:

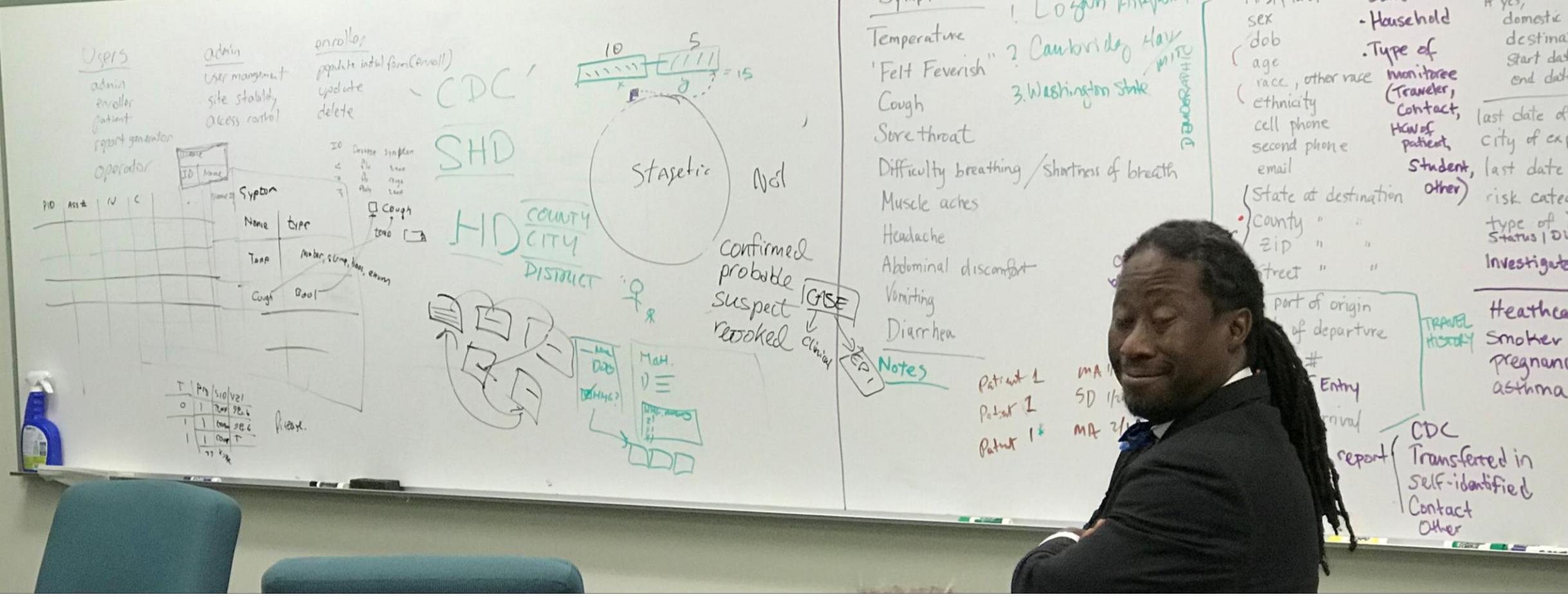
- **Connecting people and data to reinvent health systems**
- **Enhancing the care experience**
- **Protecting and promoting the health and well-being of all Americans**

Dedicated to solving the complex health and human services problems

- **Objectivity and independence**
- **Special access to sensitive data**
- **Deep expertise in health policy and IT**
- **Stakeholder convener**
- **Broad alliance of private-sector resources**

**MITRE internal research funds were used to develop Sara Alert**

**Sara Alert is free to public health organizations**



# How it all began...



## Sara Alert™ Principal Partners

- Association of State and Territorial Health Officials (ASTHO)
- National Association of County and City Health Officials (NACCHO)
- Council of State and Territorial Epidemiologists (CSTE)
- Association of Public Health Laboratories (APHL)
- Center for Disease Control Foundation (CDCF)

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# The Journey to Build Sara Alert

**10 days** 

to Develop Concept

(January)

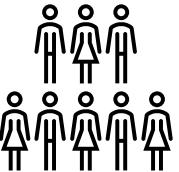
**10 weeks** 

to Build

(March/April)

- Add in # briefings



**For Public Health** 

Over **600** Jurisdictions



**8** States

**1** Tribe

**11** Locals

**2** Territories

**1** Freely Associated State



**Launched**

April 3<sup>rd</sup>

# An Enduring National Resource to Contain Disease



**Sara Alert**™

Secure monitoring and reporting for public health

**Automates monitoring of exposed  
and infected individuals**



Disease-independent



Developed in partnership with key public  
health partner organizations

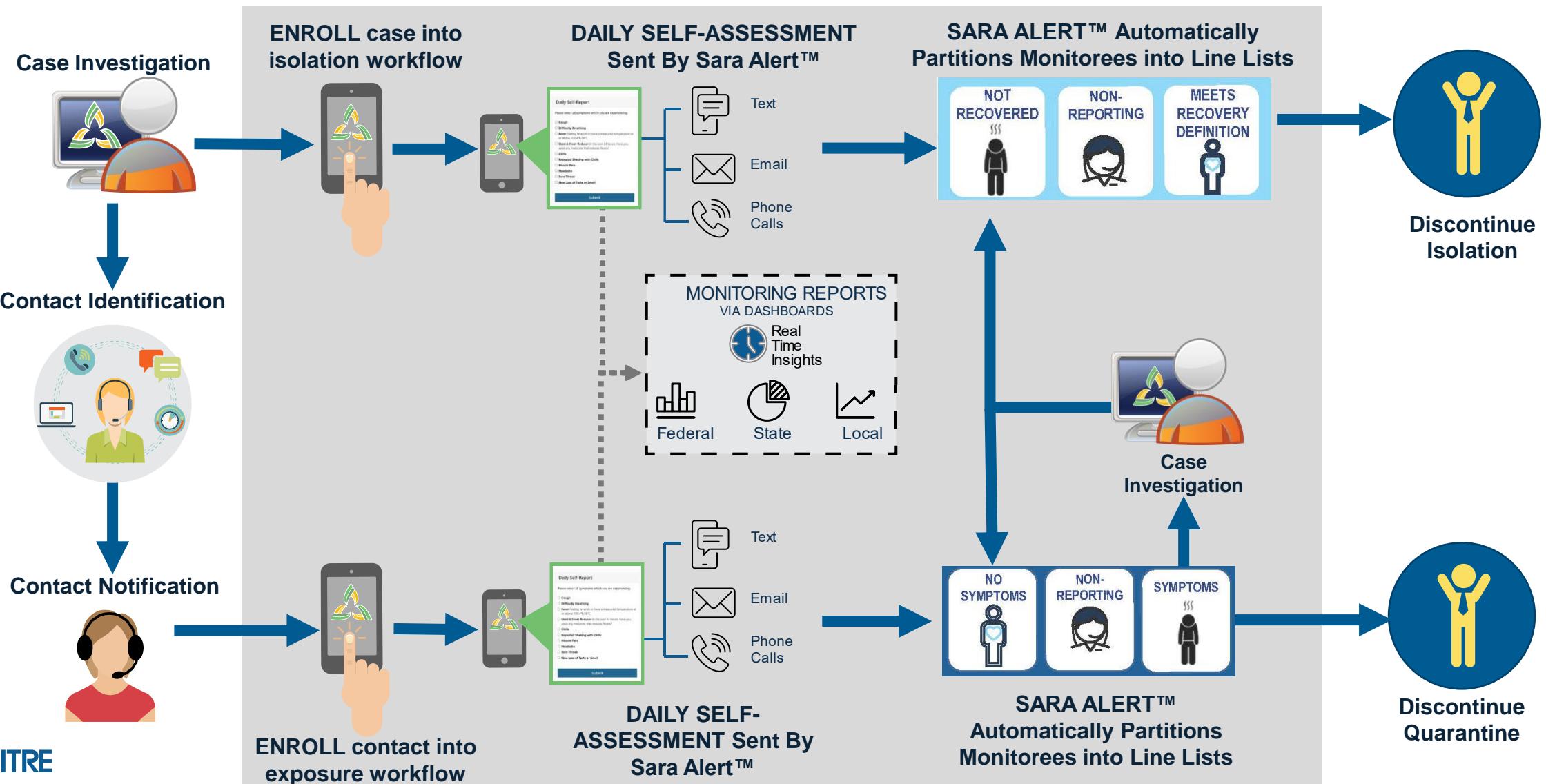


Secure and scalable

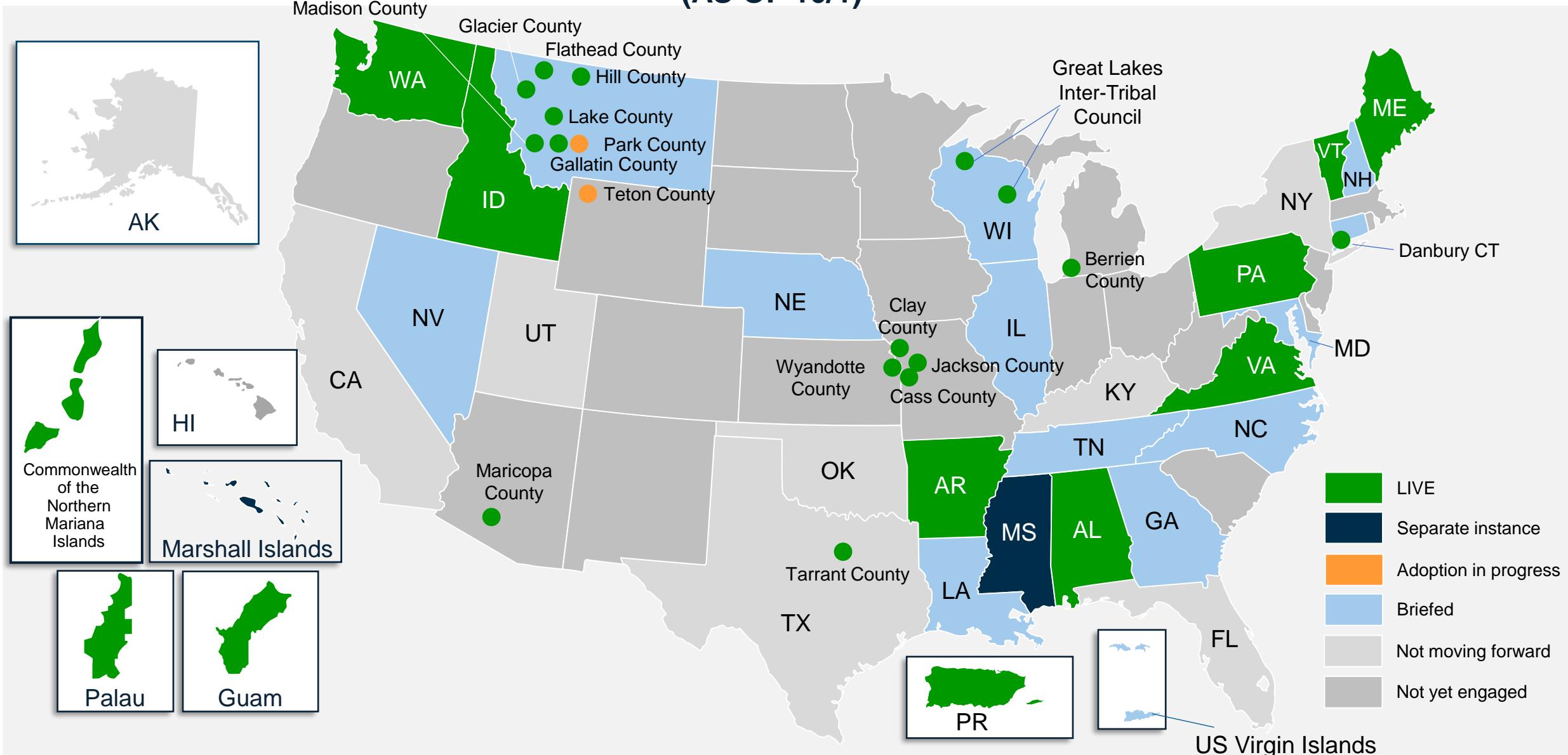
**Force multiplier directing resources where they are needed most**



# Automates Monitoring of Exposed And Infected Individuals



# SARA ALERT™ ADOPTION (AS OF 10/1)



# SARA ALERT™ USAGE

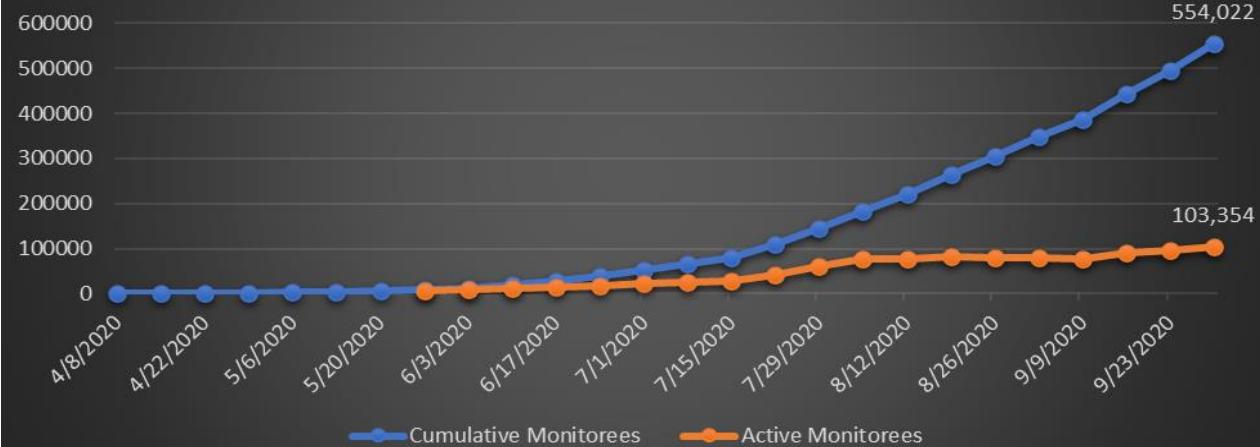
By the numbers (as of 9/30/2020)

**554,022**  
Total Cumulative  
Monitorees  
(12% increase from prior week)

**7,139**  
Public Health  
Users  
(5% increase from prior week)

**639** Total Jurisdictions including  
**15 States, 4 Tribes, 2 Territories,**  
**1 Freely Associated State, over 300 Locals, and more**

## Total Cumulative and Active Sara Alert™ Monitorees



## Monitoree Flow Over Time

Last 24 Hours    Last 14 Days    Total

### INCOMING

New Enrollments	10,214	111,662	554,022
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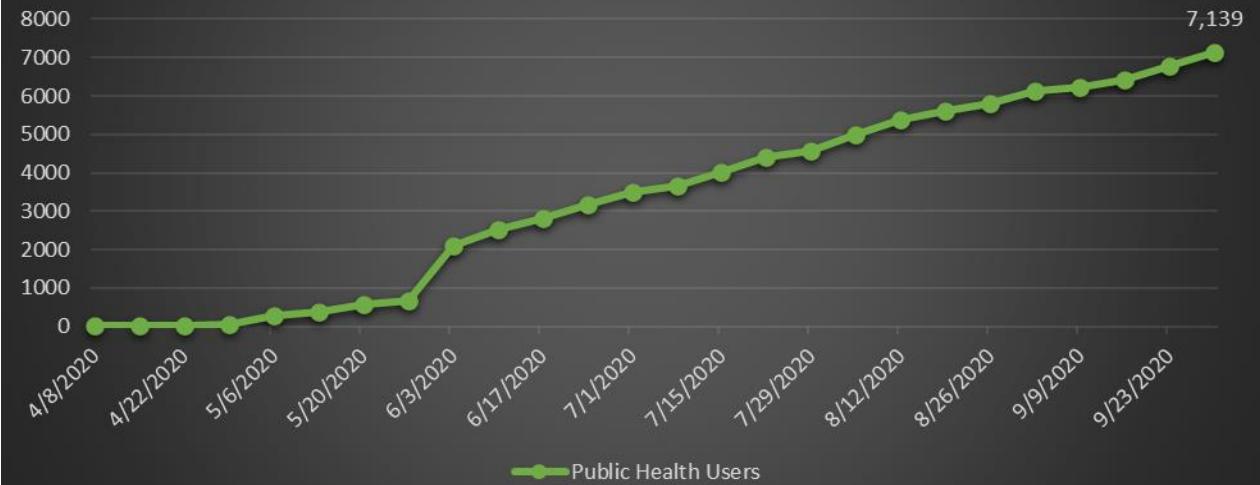
### OUTGOING

Closed	7,233	96,364	450,668
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### ACTIVE MONITOREES

103,354

## Total Number of Sara Alert™ Public Health Users



# Built with Public Health for Public Health

Agile development enables rapid implementation of users' priorities

*"The partnership between ADH and Sara Alert™ has been enlightening and beneficial."*

- **Public Health users have made important contributions**
  - Isolation workflow
  - Household monitoring logic
  - Language translations
- **Public Health is driving advanced features**
  - Advanced search and filter needs
  - Manual enrollment of cases
  - Bulk record updating
  - "Assigned User" feature for monitoree records
  - Continuous monitoring capability
  - Customized branding, questions, and symptoms

*"It has been so exciting to participate in the Feature Review calls each week. It is exhilarating to participate in a discussion about new features one week and see them in action in the system the next week. Thank you for taking feedback into consideration so quickly!"*

[< TO NACCHO VIRTUAL COMMUNITIES HOME](#)

## *Welcome to the Sara Alert™ Forum*



- Share expertise, resources, ideas, and experience using Sara Alert™
- Discuss ways to use or connect Sara Alert™ with existing tools and systems
- Brainstorm ideas for strengthening Sara Alert™ for future public health needs



# Sara Alert<sup>™</sup>

Secure monitoring and reporting for public health

EMAIL: [sarasupport@aimsplatform.com](mailto:sarasupport@aimsplatform.com)

WEB: [saraalert.org](https://saraalert.org)

## For more information:

- Learn more about us at  
<https://saraalert.org>
- Get our source code at  
<https://github.com/SaraAlert>
- Watch our video on YouTube at  
<https://youtu.be/s-1FFRziUeQ>
- Learn more about MITRE at  
<https://www.mitre.org/>

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# Appendix

# Sara Alert™ Protects Data Privacy



Collect only what is needed to support public health operations



Data encrypted at rest and in flight



Data stored only during monitoring period, then purged from the system



Data invisible to MITRE, access controlled by the jurisdiction

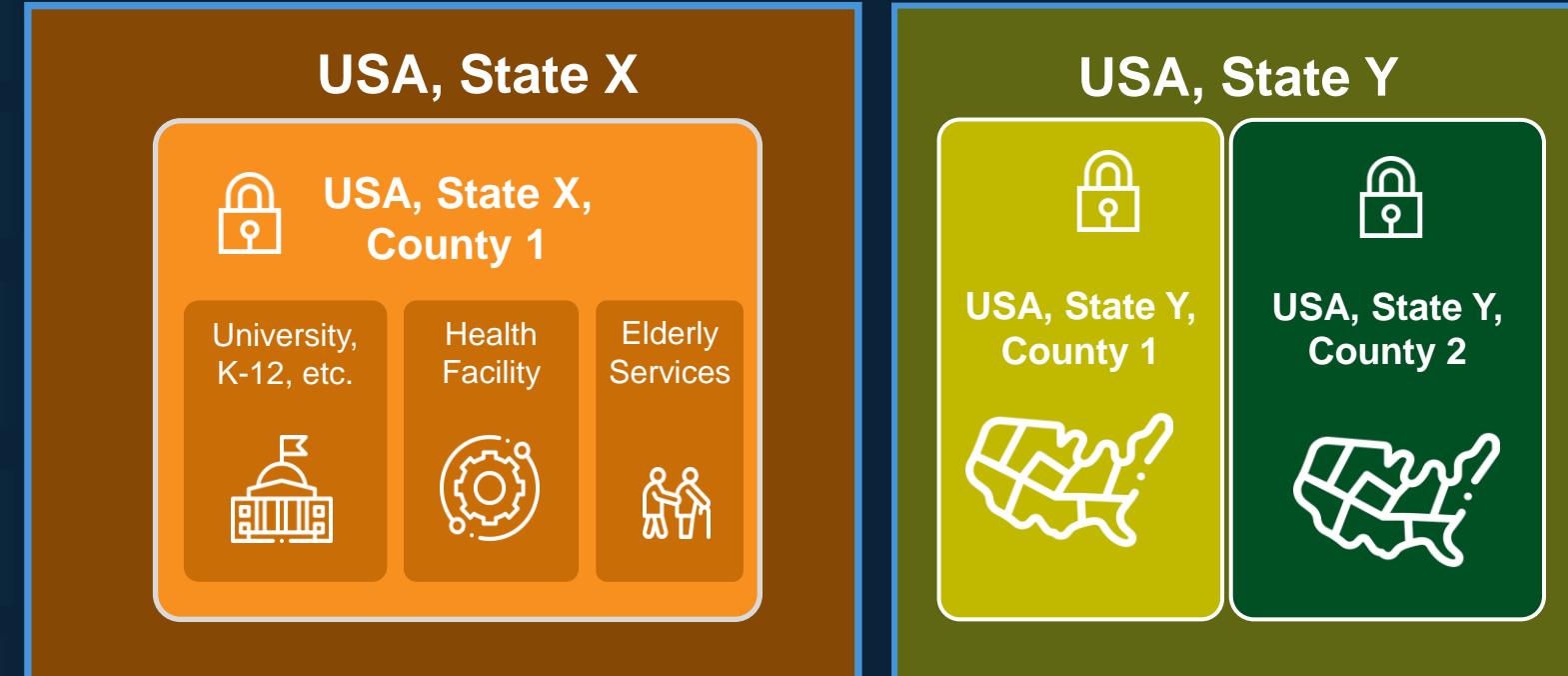


Application provides two-factor authentication process



AIMS Platform is FISMA-Moderate compliant  
Amazon Cloud is FedRAMP compliant

## Example Data Access Hierarchies



- ✓ Users have role-based access to records for their monitorees
- ✓ Administrators credential users in their own jurisdiction
- ✓ Users cannot see data for other jurisdictions
- ✓ Only top-level users have access to all data for their jurisdiction (e.g., USA, State X)

# Sara Alert™ Reduces Public Health Workload



- **Enables individuals to provide daily reports on symptoms**
  - Text, Email, Web, Robo calls
- **Automatically partitions the data into categories, allowing public health officials to focus where needed**
  - Symptomatic
  - Non-reporting

Sara Alert v1.7.0    [state1\\_epi\\_enroller@example.com](#) | [?](#) | [Logout](#)  
Your Jurisdiction: USA, State 1

Exposure Dashboard

[Analytics](#) [Enroll New Monitoree](#) [Export](#) [Import](#) [Exposure Monitoring \(370\)](#) [Isolation Monitoring \(157\)](#)

Symptomatic 150 Non-Reporting 160 Asymptomatic 0 PUI 23 Closed 37 Transferred In 0 Transferred Out 64 All Monitors 370

Monitorees who have reported symptoms, which need to be reviewed. You are currently in the [exposure](#) workflow. [?](#)

Show Jurisdiction: USA, State 1 All Search: Assigned User: All

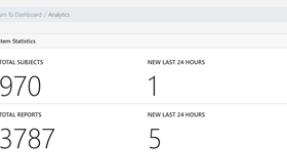
Show 15 entries

Monitoree	Jurisdiction	Assigned User	State/Local ID	Sex	Date of Birth	End of Monitoring	Risk Level	Monitoring Plan	Latest Report
Auer54, Alaina32	County 2			Female	2000-10-23	2020-06-14	High	None	2020-06-18 15:43 EDT
Barrows04, Stan67	County 1	8259		Male	1990-07-08	2020-06-09			2020-06-04 12:49 EDT
Bartell55, Shantae87	County 2	9069	EX-684769	Female	2009-05-22	2020-06-06	Medium	Self-observation	2020-06-03 08:42 EDT
Bayer17, Francisco62	County 1	5375	EX-384423	Female	1938-01-19	2020-06-08	Medium	None	2020-06-03 12:26 EDT
Bednar13, Yvette94	County 2	8052	EX-149591	Female	1975-08-01	2020-06-11	Medium	Self-monitoring with delegated supervision	2020-06-04 13:27 EDT
Blick37, Luci47	County 2	6043		Unknown	1995-04-23	2020-06-11	High	Daily active monitoring	2020-06-04 08:20 EDT
Bosco08, Kendall82	State 1	455		Unknown	2004-03-28	2020-06-11	Medium	Self-observation	2020-06-04 13:47 EDT
Botsford84, Tami94	County 2	4918		Female	1964-10-17	2020-06-04	Medium		2020-06-04 14:34 EDT

# Sara Alert Roles

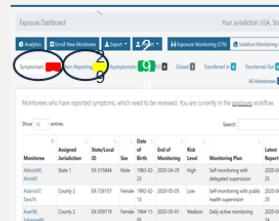
## Enroller

Enrolls



Views  
Dashboard

## Public Health



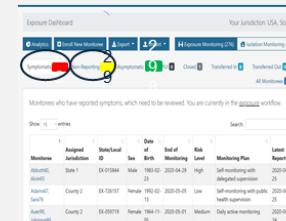
Monitors



Views  
Dashboard

## Public Health Enroller

Enrolls



Monitors



Views  
Dashboard

## Analyst



Views  
Dashboard

# Use Cases

## Monitoring Communities

### Public Health Jurisdictions

- Public health officials monitor individuals in a county or state



### Educational Institutions

- Administrators monitor students and faculty at a school



### Vessels at Sea

- CDC and USCG monitor passengers and crew members



## Monitoring the Workforce

### Healthcare Professionals

- Hospitals monitor healthcare professionals



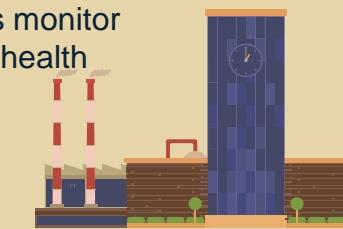
### Troop Status

- Armed forces monitor troop health



### Employee Health

- Employers monitor employee health



# HL7 FHIR API

- **Fast Healthcare Interoperability Resources**
- **FHIR v4.0.1 (Normative ANSI Standard)**
- **The basic building block in FHIR is the Resource**
  - e.g. Patient, Observation, Questionnaire Response, etc.
  - Resources and data are encoded as JSON
- **FHIR uses HTTP verbs for interactions**
  - GET – read and search
  - POST – create
  - PUT – update
  - DELETE - delete

```
GET /fhir/r4/Patient/5

{
  "id": 5,
  "meta": {
    "lastUpdated": "2020-05-29T00:19:18+00:00"
  },
  "extension": [ ... ],
  "active": true,
  "name": [
    {
      "family": "O'Kon89",
      "given": [ "Malcolm94", "Bogan39" ]
    }
  ],
  "telecom": [
    {
      "system": "phone",
      "value": "(333) 333-3333",
      "rank": 1
    }
  ],
  "birthDate": "1981-03-30",
  "address": [
    {
      "line": [ "22424 Daphne Key" ],
      "city": "West Gabrielmouth",
      "state": "Maine",
      "postalCode": "24683"
    }
  ],
  "communication": [
    {
      "language": {
        "coding": [
          {
            "system": "urn:ietf:bcp:47",
            "code": "en",
            "display": "English"
          }
        ]
      }
    }
  ],
  "resourceType": "Patient"
}
```