Salt River Pima Maricopa Indian Community
Scottsdale | Arizona

Challenges & Lessons Learned from COVID-19 Pandemic
Data Collection | Analysis | Sharing
May 2023
Long Overview Video: https://vimeo.com/241915565
Our Story

• 1. Getting to know the SRPMIC tribe
• 2. Introducing the SRPMIC Data Team
• 3. A look at Data before Covid19
• 4. March 2020 .. Until present
• 5. Connecting data in the future
• 6. Data Hungry
The TEAM

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DATA BEFORE COVID 19

- Siloes internally
- ADHS MEDSIS
- ASIIS
- PRISM
- Data Sovereignty
  seeking control of our data
- Health System E H R access
- Data Communication Style
Emergency Operations Centers (EOC) March 2020

- First case 3.13.2020
- 3.19.2020 SRPMIC moves to essential services only
Points of Entry
- COVID-19 Hotline (24/7)
- Public Health Nurse Line (24/7)
- Walk-ins
  - Triage by Clinic Staff
<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Date of Birth</th>
<th>Address</th>
<th>Date of Test</th>
<th>Location of Test</th>
<th>Result of Test</th>
<th>Date of Result</th>
</tr>
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<td></td>
<td></td>
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<td>PIMC</td>
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<td>3/16/2020</td>
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<td>Negative</td>
<td></td>
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<td></td>
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<td>4/26/1993</td>
<td>Scottsdale, AZ 85256</td>
<td>3/16/2020</td>
<td>HH-Osborn/3823641</td>
<td>Pending</td>
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Manual calculations and reports lead to partnerships

- Community Manager
- GIS
- IT
- CDD
- HR
## COVID Testing Addresses

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<thead>
<tr>
<th>ID</th>
<th>Patient Chart Number</th>
<th>First Name</th>
<th>Last Name</th>
<th>Date of Birth</th>
<th>Enrollment</th>
<th>Residency</th>
<th>Employment</th>
<th>Title Dept</th>
<th>Date Collected</th>
<th>Location of Test</th>
<th>Test Result</th>
<th>Date of Result</th>
<th>In_Hospital</th>
<th>Recovery Status</th>
<th>Result In Death</th>
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<td>1</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Date_Collected: 4/25/2023 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date_Collected: 4/24/2023 (12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
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</tr>
<tr>
<td>4</td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
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</table>
GIS – Case Tracking
Auto-magic reports
Auto-magic reports

- Community Manager
- Support decision making

### Employee positive cases:

<table>
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<th>Category</th>
<th>Count</th>
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<tr>
<td>Government Employee Positives as of 8/1/2022</td>
<td>1206</td>
</tr>
<tr>
<td>Government Employee Positives between 7/26/2022 and 8/1/2022</td>
<td>25</td>
</tr>
<tr>
<td>Enterprise Employee Positives as of 8/1/2022</td>
<td>323</td>
</tr>
<tr>
<td>Enterprise Employee New Positives between 7/26/2022 and 8/1/2022</td>
<td>2</td>
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Information Sharing

Alarm Room List

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<tr>
<th>List Item Id</th>
<th>Address</th>
<th>City</th>
<th>Zip Code</th>
<th>Date Collected</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>39074</td>
<td></td>
<td>SCOTTSDALE</td>
<td>85256</td>
<td>9/29/2022</td>
<td>Positive</td>
</tr>
<tr>
<td>42320</td>
<td></td>
<td>Scottsdale</td>
<td>85256</td>
<td>1/3/2023</td>
<td>Presumptive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Positive-EF</td>
</tr>
<tr>
<td>29969</td>
<td></td>
<td>Scottsdale</td>
<td>85256</td>
<td>2/2/2023</td>
<td>Presumptive</td>
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<tr>
<td>42318</td>
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<td>85256</td>
<td>1/3/2023</td>
<td>Positive</td>
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<tr>
<td>29970</td>
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<td>Scottsdale</td>
<td>85256</td>
<td>7/27/2021</td>
<td>Positive-EF</td>
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<tr>
<td>27284</td>
<td></td>
<td>Scottsdale</td>
<td>85256</td>
<td>1/5/2022</td>
<td>Positive</td>
</tr>
<tr>
<td>38740</td>
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<td>Scottsdale</td>
<td>85256</td>
<td>9/19/2022</td>
<td>Positive</td>
</tr>
<tr>
<td>29971</td>
<td></td>
<td>Scottsdale</td>
<td>85256</td>
<td>10/9/2021</td>
<td>Positive-EF</td>
</tr>
<tr>
<td>42277</td>
<td></td>
<td>Scottsdale</td>
<td>85256</td>
<td>1/5/2023</td>
<td>Presumptive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Positive</td>
</tr>
</tbody>
</table>

Behavioral Health
Care bundle

Dispatch
PD
Fire
SharePoint – Contact Tracing

COVID Testing Addresses

+ new item

Tests Collected Today  Modified  Contact Tracing View  ...  Find an item  

- Assigned Contact Tracer: Evan DiGiovanni (2)
- Assigned Contact Tracer: Haley Bodmer (2)
- Assigned Contact Tracer: Hospitalized (1)
- Assigned Contact Tracer: Zelena Shaw (4)
Other solutions...

• ARC GIS
• Salesforce
• Microsoft solutions
• State Solutions-Contact Tracing
The Idea of Electronic Case Reporting: Thinking Locally
As of April 11, 2023, more than 24,200 facilities in all 50 states are actively sending electronic initial case reports to public health using eCR.

https://www.cdc.gov/ecr/facilities-map.html
How Electronic Case Reporting Would Look

[Diagram showing the architecture of electronic case reporting (eCR) with various components and paths, including HL7 standards, eCR, eSD, CSTE/CDC, APHL Platform, and Public Health Agency.]
Four Points of Interest

[Diagram showing Electronic Case Reporting (eCR) Architecture]

1. Triggering Set-Up
2. Policy Path
3. eCR
4. eRSR

**HL7 Standards**
- eICR - Electronic Initial Case Report CDA R1.1 (current) -> CDA R3.1
- RR - Reportability Response CDA R1.0 (current) -> CDA R1.1
- eCR - FHIR R2.1.0 (includes eCR, RR, and eRSR)

**Possible Policy Agreements**
- eHealth Exchange, Carequality, APHL participation agreement

**Terms**
- RCKMS - Reportable Condition Knowledge Management System
- eRSR - Electronic Reporting and Surveillance Distribution System

Point 1: Set Up RCKMS Account

- Work with CDC/CTSE to create an account
- “Select” and “publish” reporting specifications

Point 1: Set Up RCKMS Account (Continued)
Point 2: Identifying or Procuring an Integration Engine Software Solution

- Work with your IT to determine your tribe/community’s integration engine software
  - One popular option/product is called Rhapsody from Orion Health
  - SRPMIC uses an in-house custom development product
    - Unfortunately, I do not have a representative picture for this

**Point 3: Establishing a Connection with AIMS**

- A good resource I highly recommend visiting and reviewing the resources found at
  - [https://ecr.aimsplatform.org/public-health/agencies/](https://ecr.aimsplatform.org/public-health/agencies/)

Public Health Agencies

Overview

Every public health agency (PHA) has the legal authority to receive case reports on conditions of interest to them, and these conditions and criteria for reporting can vary greatly from agency to agency. While historically this type of reporting has been done by paper-based submission, electronic case reporting (eCR) is moving this process into a more automated process.

Automating the submission of case reports from healthcare providers reduces the burden of meeting the legal requirement to report, while improving the timeliness, accuracy, and completeness of data for public health action. Manual reporting processes can stall the public health response required to manage case investigations, contain outbreaks, or plan interventions to protect a population’s health. eCR allows reports to be sent automatically from a healthcare provider’s electronic health record (EHR) system to the PHA in near real time, alleviating manual reporting burden.

It is a time-and-cost-efficient tool that leads to rapid productivity in disease case reporting and data collection, improving routine outbreak management.

Included here is information relevant to PHAs as they begin to implement the eCR functionality. The items include:

- Understanding the standards used for eCR messages (electronic initial case report (eICR) and Reportability Response (RR))
- How a PHA should prepare in order to implement eCR
- Where the Reportable Condition Knowledge Management System (RCKMS) decision support and authoring fit in with the eCR process
- How to handle onboarding and implementation

Contact Us:

For general eCR inquiries, contact eCR-Info@aimsplatform.org.

For eCR connection technical problems and support, contact the eCR Support Team at Informatics.Support@aphl.org. Include “eCR” in the subject line.

For technical questions about the eCR Now FHIR App, use the eCR Now Zulip Thread.
Point 4: Connecting the eCR Files to Your Public Health Surveillance System or Standing Up a Database (e.g. SQL)

- Currently, SRPMIC does not have a public health surveillance system, aside from the COVID-19 SharePoint previously discussed.
- Since beginning this project, we have conducted research, to avoid not reinventing the wheel.

Public Health Information Systems (PHIS)

Public Health Information systems (PHIS) are used by public health agencies (PHA) to collect, manage, store, and transmit STD data. CDC is leveraging HIS to better understand the impact of STDs in the United States and improve disease surveillance reporting.

In the United States, there are seven main information systems currently used by states, territories, and project areas. All the systems are web-based.

PHIS Used by Each State, Territory, and Project Area

*PRISM-based refers to customized systems based on a version of PRISM HDG.

For more information, please visit the CDC's Public Health Surveillance page: https://www.cdc.gov/std/informatics/public-health-information-systems.htm
Public Health Surveillance System Literature Review Research

• Research Question: What surveillance system PHAs ingesting eCR data?
• Search Term: “Electronic Case Reporting” AND “eCR”
• Methodology: Reviewed articles
• Databases used:
  • Clinical Key
  • EBSCOhost
  • Embase
  • Google Scholar
  • Web of Science
Public Health Surveillance System Literature Review Results (Continued)

- **Illinois** receives eCR data via the Illinois National Electronic Disease Surveillance System (I-NEDS)
- **Oregon** receives eCR data via the Oregon Public Health Epidemiology User System (Orpheus)
- **Washington** receives eCR data via the WA Disease Reporting System
- **Minnesota** receives eCR data via the Minnesota Electronic Disease Surveillance System
- **Utah** Department of Health receives eCR data via **EpiTrax**
- **Iowa** receives eCR data via their **National Electronic Disease Surveillance System Base System (NBS)**
EpiTrax, by End Point Dev

- “End Point has developed a suite of solutions that builds upon the EpiTrax project and supports public health jurisdictions in electronic laboratory reporting (ELR) and electronic case reporting (eCR).” - End Point Dev

https://www.endpointdev.com/expertise/epitrax/
“Currently, 27 health departments (21 states; Washington, DC; CNMI; Guam; Puerto Rico; RMI; and U.S. Virgin Islands) use NBS to manage public health investigations and transfer general communicable disease surveillance data to CDC.”

- [https://www.cdc.gov/nbs/overview/index.html](https://www.cdc.gov/nbs/overview/index.html)

Features of NBS includes:

- “automated receipt of electronic case reports from healthcare providers, other health information systems, and other public health jurisdictions”

- [https://www.cdc.gov/nbs/features/index.html](https://www.cdc.gov/nbs/features/index.html)
### Other Notable Documents:

#### Table 4: Characteristics of Digital Bridge eCR Demonstration Sites

<table>
<thead>
<tr>
<th>Site Characteristics</th>
<th>California Department of Public Health</th>
<th>Houston Health Department</th>
<th>Kansas Department of Health and Environment</th>
<th>Massachusetts Department of Public Health</th>
<th>Michigan Department of Health and Human Services</th>
<th>New York City Department of Health and Mental Hygiene</th>
<th>New York State Department of Health</th>
<th>Utah Department of Health</th>
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</thead>
<tbody>
<tr>
<td><strong>Type of Jurisdiction</strong></td>
<td>STATE</td>
<td>LOCAL</td>
<td>STATE</td>
<td>STATE</td>
<td>STATE</td>
<td>LOCAL</td>
<td>STATE</td>
<td>STATE</td>
</tr>
<tr>
<td><strong>Public Health Surveillance System</strong></td>
<td>CalIREDIE</td>
<td>MAVEN</td>
<td>EpiTrax</td>
<td>MAVEN</td>
<td>CUSTOM SYSTEM</td>
<td>CUSTOM SYSTEM</td>
<td></td>
<td>EpiTrax</td>
</tr>
<tr>
<td><strong>EHR Vendor</strong></td>
<td>EPIC</td>
<td>EPIC</td>
<td>CERNER</td>
<td>EPIC</td>
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<td>EPIC</td>
<td>CERNER</td>
<td>EPIC</td>
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<tr>
<td><strong>Transport mechanism with AIMIS platform</strong></td>
<td>AWS S3</td>
<td>PHINMS</td>
<td>PHINMS</td>
<td>To be determined</td>
<td>RESTFUL + VPN</td>
<td>AWS S3</td>
<td>AWS S3</td>
<td>AWS S3</td>
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<tr>
<td><strong>Experience Using CDA Documents in Public Health Surveillance System</strong></td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td><strong>Prior Experience Using RCTC or Standardized Codes for Reportable Conditions</strong></td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
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<tr>
<td><strong>Existing AIMIS Interface</strong></td>
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<td><strong>Prior ECR Experience</strong></td>
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<td>unknown</td>
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<td>✗</td>
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<tr>
<td><strong>Healthcare Facility is Outpatient (♀) or Inpatient (♂)</strong></td>
<td>✂</td>
<td>✂</td>
<td>✂</td>
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<td>✂</td>
<td>✂</td>
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<td>✂</td>
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</table>
Vendor Analyses

Each vendor analysis includes a profile of the system, system highlights, a synopsis, and a detailed analysis of the system in terms of support for the applicable core functions of Reportable Conditions Surveillance. Analyses of the seven vendors are presented alphabetically, grouped by classification. This arrangement does not represent any kind of ranking.

Comprehensive Electronic Disease Surveillance Systems

**Atlas (WorldCore)**

**Comprehensive: WorldCore provides robust support for all of the Reportable Conditions Surveillance Functions.**

**Highlights:**
- Highly customizable for the end-users
- Designed with input from former Public Health officials
- Focus of the system is at the local level
- User defined forms for creating custom forms using Microsoft Word
- An electronic filing cabinet for any file type or image

**Synopsis of Analysis:**
As a comprehensive ESIS, WorldCore handles all aspects of reportable conditions surveillance. From condition monitoring, where the system can receive information via EHR or manually, to case investigation and outbreak management, the system seamlessly provides the public health user with an ability to gather relevant data across multiple areas of surveillance. The system is set up to be very user-friendly and customizable.

This analysis was conducted April 2013
## Salt River Pima-Maricopa Indian Community eCR Implementation

<table>
<thead>
<tr>
<th>Point of Interest</th>
<th>Status</th>
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<tr>
<td>Set Up RCKMS Account</td>
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<tr>
<td>Identifying or Procuring an Integration Engine Software Solution</td>
<td>?/✓</td>
</tr>
<tr>
<td>Establish a Connection to AIMS</td>
<td>X</td>
</tr>
<tr>
<td>Connecting the eCR Files to Your Public Health Surveillance System or Standing Up a Database</td>
<td>X</td>
</tr>
</tbody>
</table>
Lessons Learned

- IT solutions for small public health departments are too expensive
  - May need cooperatives and sustainable financial support
- Technical support and education is essential for both public health and technical staff
  - SME led eCR training team may need to be deployed

Way Forward for eCR

• After establishing a connection to AIMS, SRPMIC will most likely create a database, to make sense of the eCR data, before standing up a public health surveillance system
  • My hope is to do this using either Microsoft Access (2016) or R
• Currently, SPRMIC is still exploring public health surveillance systems
• SRPMIC IT is fully aware of the eCR project and is currently reviewing documents submitted
What Data Modernization would mean to SRPMIC!

- Improving data quality
- Data modernization
  - can reduce the risk of errors.
  - Improve the overall reliability of databases
- Allows tribal leadership to make better decisions based on accurate information.
- Implementing cloud technologies as a solution for data storage, management, and analytics.
The story continues...