

# The Importance of Technology Tools in Pandemic Response and the Impetus for MARI

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## The Tracing Health Program

The Public Health Institute and the Oregon Public Health Institute created the Tracing Health program in the spring of 2020 to meet the needs of the COVID-19 pandemic and to mitigate the exacerbation of health inequities. Tracing Health combines best practices and an equity-driven approach to provide a comprehensive suite of support services to health departments and healthcare partners navigating COVID-19 response and recovery.

## Building MARI: A Team Effort Informed by Real-World Experience and Users

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*A Tracing Health leadership spotlight with Hemanth Kundeti - Director of Software Engineering*

## MARI; Microbe Awareness and Risk Intervention

### The MARI Platform: Nimble and Agile

After partnering with Oregon Public Health Institute on contact tracing and case investigation oversight for multiple Pacific Northwest counties, the Tracing Health leadership team of Dr. Marta Induni and Emily Henke wanted to develop tools that could help the teams become more efficient. They envisioned creating a contact tracing data platform that could provide more timely and accurate data collection to help slow the spread of the virus. Dr. Induni tapped Hemanth Kundeti to become Tracing Health's Director of Technology & Data Operations and charged him with the task of developing what would become the MARI system.

At the time, Tracing Health was all-hands-on-deck, and everyone from leadership to data architects and research scientists was taking part in the frontline contact tracing work. This real-world immersion helped Hemanth, and his team understand contact tracers' challenges and informed their approach to developing the platform.

The initial contact tracing platform that the team built was customized and based directly on staff experience with COVID-19. It was developed using a PowerApps platform on SharePoint and was a HIPAA-compliant and responsive approach to contact tracing that was meant as a stop-gap measure. Little did they know that they were building the prototype for what would become the much more robust Microbe Awareness and Risk Intervention or "MARI" internal data exchange and management system that Tracing Health uses to track COVID-19 cases.

Concurrent to developing and managing Tracing Health's internal contact tracing system, Hemanth and his team supported local contact tracing systems for multiple counties in Washington, Oregon, and California. This familiarity with the various platforms such as, "Kohezion" in Clark County, WA, "Crest" in Spokane County, WA, and California's statewide CalConnect system combined with their direct contact tracing experience, ensured the team was well equipped and knowledgeable of requirements needed to set up a platform tailored specifically to Tracing Health's needs.

## MARI Addressed Barriers to Effective Contact Tracing

Ultimately, Microsoft Dynamics CRM was selected as the underlying technology ecosystem for the MARI platform. This system is aligned with Tracing Health's Microsoft cloud infrastructure while being cost-effective, agile, and flexible. Hemanth had expertise in Dynamics CRM, but while he was able to scale up the existing platform, he couldn't do it alone in the expedited time frame required. So he was quickly joined by two data analysts, Sheila Pugh and Kedar Patil, to support the emergency buildout of this custom contract tracing platform.

On more than one occasion, the workday would extend late into the night. Hemanth recalls working until 2:00 AM to meet the rapid demands of the COVID -19 pandemic.

*“ Every sacrifice was worth it. I was grateful for the opportunity to use my skills and experience to support this effort. ”*

—Hemanth Kundeti, Director of Technology & Data Operations

Hemanth is quick to point out that the development and launch of MARI took many hands; from Dr. Induni provided the vision and leadership to Sheila and Kedar pulling long shifts to learn the Dynamics CRM system; plenty of people made sacrifices to get MARI developed at record speeds. The ultimate success of MARI also relies on the hundreds of contract tracers providing immediate feedback as well as the support team of Daniel Cramer, Jessica Fay, Purity Sogomo-Robbins who continuously update and improve the system based on this feedback. MARI has truly been a team effort that all of Tracing Health can celebrate.

*“ MARI was, without a doubt, a complete team effort. ”*

—Hemanth Kundeti, Director of Technology & Data Operations

MARI was developed in just six weeks, with project licensing costs of about \$100,000. Compared to other similar systems that have taken as long as six months to build out with costs upwards of \$20,000,000, MARI has proven to be an impressively economical and competent system for contact tracing. Immediately upon launch, MARI was deployed within our partner clinics and helped Tracing Health's contact tracers serve hundreds of cases in a matter of weeks.

Before MARI, Tracing Health contact tracers received cases from CalConnect seven to ten days after a positive case test. This delay created a severe problem, as the infection period for COVID-19 usually occurs before a positive test. The recommended isolation period was nearly complete by the time cases and contacts were notified, so contact tracing efforts are essentially futile at this stage of infection.

The MARI system that Hemanth, Sheila, and Kedar developed gave Tracing Health access to data directly from laboratories and facilities, thus enabling contact tracing to begin within one day of a positive COVID-19 test. This crucial efficiency was a lifesaving improvement in the fight to contain the pandemic.

## MARI: Developed to Manage Contact Tracing Data Effectively

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*MARI solved a problem that California was experiencing with the timeliness of receiving positive COVID-19 tests. This was possible for three primary reasons:*

- ① MARI was directly informed by Tracing Health's ground experience with COVID-19 contact tracing.
  - ② The Tracing Health Technology and Data Operations team were given freedom, latitude, and encouragement to develop an effective, secure system with minimal barriers and funder mandates.
  - ③ MARI was conceptualized and ultimately designed to be flexible and adaptable to meet the evolving needs of the pandemic.
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## The MARI Platform: Nimble and Agile

MARI is a prototype data management system, and though it was originally developed for COVID-19 contact tracing, it has already been adapted to support vaccine coordination efforts. Its architecture allows for easy modification to support a plethora of functions beyond the COVID-19 pandemic. For instance, it could be deployed to combat influenza, measles, and other infectious diseases that require rapid contact tracing. The system is effective yet simple, efficient yet robust. MARI has proven to be adept at addressing the evolving needs of the pandemic on multiple occasions.

### *Resource Coordination*

Tracing Health's funding partner Kaiser Permanente (KP) has specific workflows for wraparound services provided to cases and contacts who are part of their health network versus those who are not current KP members. When Tracing Health launched their Clinically Embedded model with KP, Hemanth and his team could easily incorporate these KP-specific procedures into MARI. This integration helped Tracing Health's contact tracers and resource coordinators provide effective and accurate services to the KP members and those not covered by KP.

### *The Future of MARI*

With MARI, Hemanth Kundeti and the Tracing Health technology and data operations team created a cost-effective, efficient tool that has tremendous utility beyond COVID-19. This innovative database is adaptable for any state, local, or county health department requiring a robust contact tracing system. MARI can be deployed in new health jurisdictions in less than a week. Creating solutions and implementing real-time strategies, MARI will be a valuable tool for the future of public health.

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Here at Tracing Health, we do our own stunts. Sometimes, we also make our own tools!

We are an experienced, effective and equity-driven contact tracing solution.

We are Tracing Health.

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For more information about our services or on partnering with Tracing Health please contact us at: [inquiries@tracinghealth.org](mailto:inquiries@tracinghealth.org)