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**Title**

Data-Driven Precision Health Messaging Leveraging EMR Data and Targeted Messaging to Increase COVID-19 Booster and Vaccination Rates

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# Data-Driven Precision Health Messaging

## Leveraging EMR Data and Targeted Messaging to Increase COVID-19 Booster and Vaccination Rates

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### Introduction

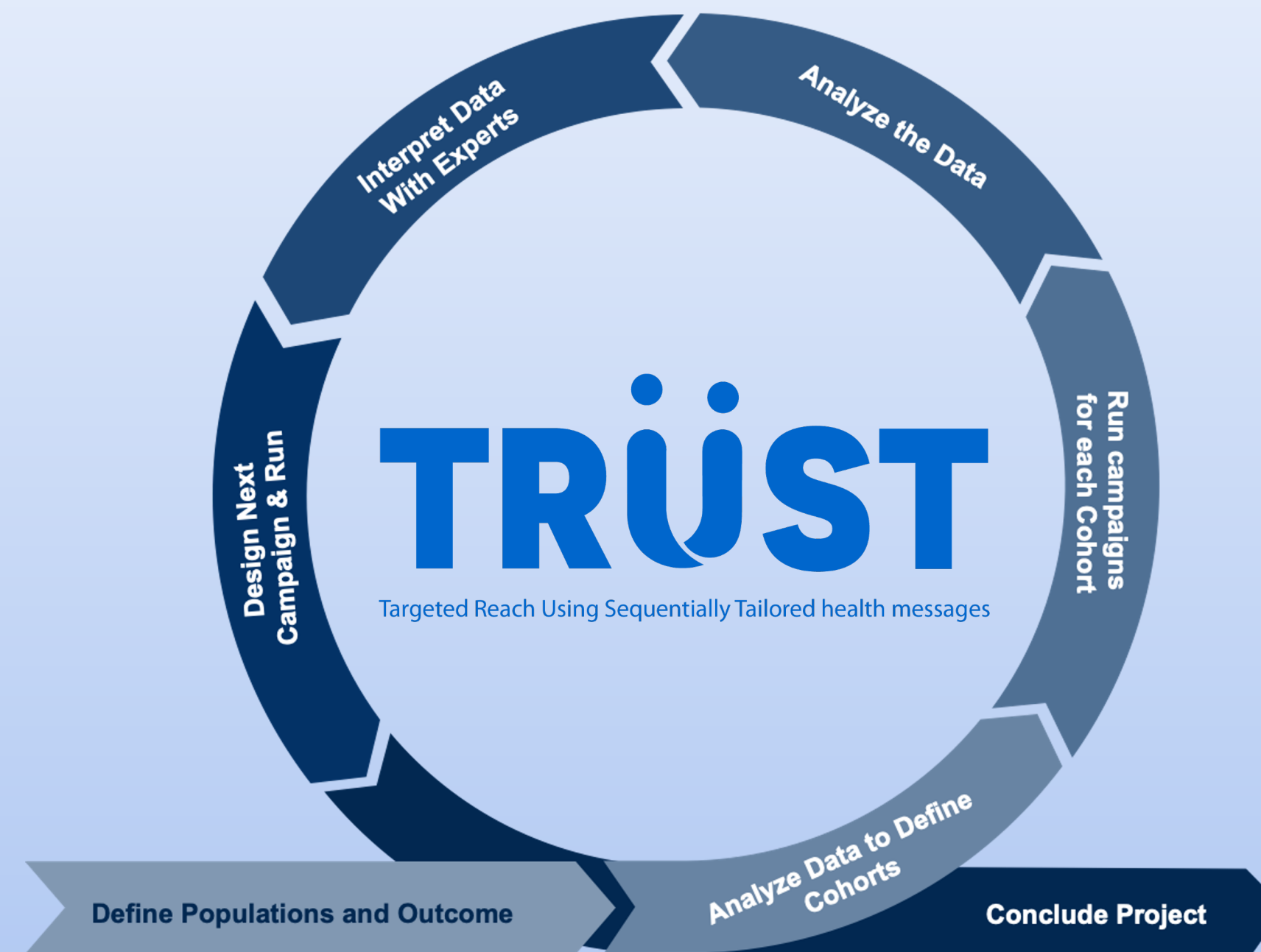
COVID-19 highlighted the challenge of connecting patients with accurate information regarding the COVID-19 vaccine. Upon seeing large disparities in vaccination rates among different populations in Sacramento, we began incorporating behavioral nudges into our digital messages to deliver information on the vaccine. To evaluate if these nudges could reduce vaccine disparities in our community, we leveraged **UCD EMR data from Epic** to identify populations with **low vaccination rates**, developed tailored messaging trees to those populations, and deployed messaging campaigns that were constantly iterated with A/B testing.

### Methods

An integration between EPIC and CAIR (CA immunization registry) was built and pulled all active, ambulatory UCD patients >18 YO. Patients were sorted into subgroups based on the demographic information. For each subgroup, tailored messages with interactive trees were developed to send via SMS text, chatbots, and UCD MyChart. TRUST Chatbot accessible here: [health.ucdavis.edu/digital](https://health.ucdavis.edu/digital)

	Number of Unboosted Patients
No Mobile, No MyChart	2,501
Mobile Only	3,253
MyChart Only	1,801
Mobile + MyChart	29,313
Mobile + MyChart (< 3 logins)	8,398
Mobile + MyChart (3+ logins)	20,915

SMS-Chatbot Campaign 11,651 | MyChart Campaign 22,716



### Framework for A/B testing

- 1) Define the population
  - a) Unvaccinated vs Unboosted
    - i) Define what counts as vaccinated: two vaccines no booster, one vaccine and still within the waiting window to get second vaccine, etc
- 2) Identify subgroups based on low rates of vaccination
  - a) Ie: Young invincibles, women of child bearing age, Latinx community
- 3) Run campaigns
- 4) Analyze data
  - a) Iterate messages, improve, rerun

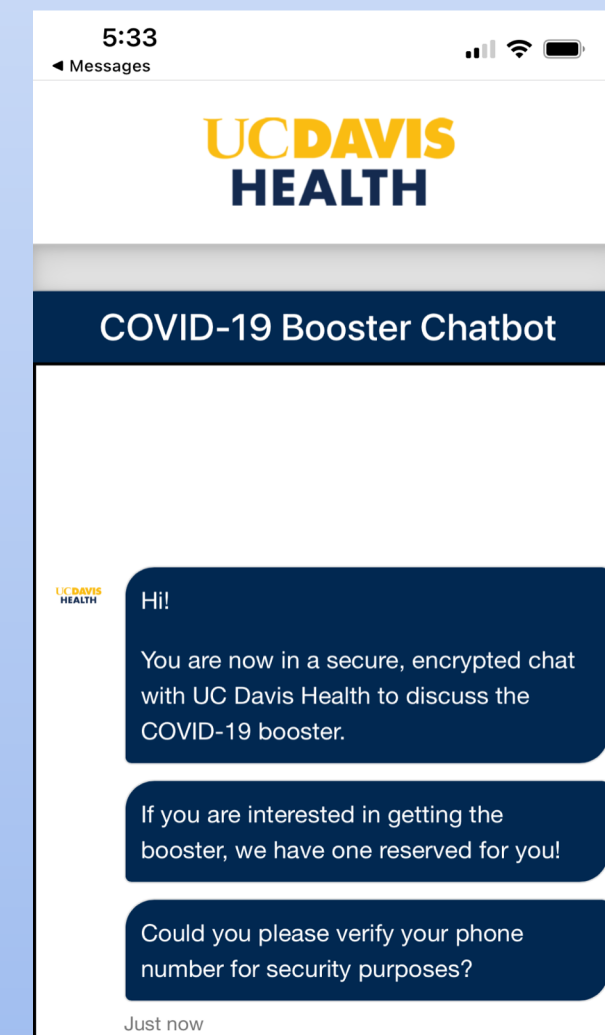
### Results

We are currently running the campaigns and expect that the results will show an improvement in the desired outcome, vaccination or booster, with each iteration of the campaign.

1. Will evaluate the success of each message tree
2. Will amend the messages for the next campaign to include only the messages that had the highest success rate.
3. Will then run the campaign again with a different cohort of patients from the same subgroup

	Booster Conversion
Message A	27%
Message B	33%
Message C	3%
Message D	0%
Message E	0%
Message F	2%
Message G	74%
Message H	8%

Sample results. Highest success rate messaging will be used in future campaign



Sample of chatbot interaction

	Unvaccinated	Vaccinated, Booster Due
<b>Total Patients</b>	34,865	36,868
w/ Email Addresses	26,257	31,281
w/ Mobile Numbers	28,614	32,566
w/ MyChart Activated	25,921	30,966
w/ MyChart Activated, 1+ login	18,353	25,812
w/ MyChart Activated, 2+ logins	16,109	23,559
w/ MyChart login in last 3yrs (2019+)	25,538	30,677
<b>w/ Email + Mobile + MyChart Activated</b>	22,460	27,951