

DEPLOYING OPINE HEALTH ASSISTANT

A close-up, slightly blurred photograph of a person's hand holding a dark-colored smartphone. The hand is positioned diagonally across the frame, with the thumb visible near the bottom right. The background is dark and out of focus.

**ACCESSIBLE MOBILE TECHNOLOGY
FOR PUBLIC HEALTH DATA: A CASE
STUDY OF FOUR DISTRICTS IN GHANA
DURING COVID-19**

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BACKGROUND

AT THE START OF THE COVID-19 PANDEMIC, IT WAS QUICKLY REALISED THAT TECHNOLOGY WOULD PLAY A SIGNIFICANT ROLE IN TRACKING AND GETTING THE SPREAD OF THE VIRUS UNDER CONTROL. COUNTRIES SUCH AS SOUTH KOREA, SINGAPORE, CHINA, AND JAPAN QUICKLY DEVELOPED NATIONALLY MANAGED MOBILE APPS TO HELP CITIZENS REPORT SYMPTOMS. WHILE WEB AND MOBILE TECHNOLOGIES ARE COMMONPLACE AND PART OF THE FABRIC OF LIFE IN MANY DEVELOPED COUNTRIES, IT IS NOT THE SAME ACROSS ENTIRE POPULATIONS IN MANY DEVELOPING COUNTRIES.

IN THE CASE OF GHANA, ALTHOUGH SOME URBAN AREAS HAVE ACCESS TO REASONABLY RELIABLE INTERNET ACCESS AND MODERN SMARTPHONES, IT IS NOT THE SAME EXPERIENCE IN MANY OTHER PARTS OF THE COUNTRY. IN MARCH 2020, THE SOFTWARE DEVELOPMENT TEAM AT COGNATE SYSTEMS DECIDED TO ADAPT THEIR OPINE DATA PLATFORM TO TACKLE THE REPORTING AND TRACKING OF COVID-19 SYMPTOMS ACROSS THE COUNTRY. THIS REPORT SUMMARIZES THE RESULTING OPINE HEALTH ASSISTANT PLATFORM, ITS FEATURES, AND HOW IT WAS DEPLOYED. IN PARTICULAR, WE HIGHLIGHT SOME DATA SUMMARIES FROM A JOINT PROJECT THAT TARGETED FOUR DISTRICTS IN GHANA. WE MAKE RECOMMENDATIONS ON HOW TO BETTER LEVERAGE ACCESSIBLE TECHNOLOGIES TO TACKLE PUBLIC HEALTH EMERGENCIES IN A DEVELOPING COUNTRY SUCH AS GHANA. A PROACTIVE APPROACH TO MANAGING INFECTIOUS DISEASE OUTBREAKS CAN ALLOW FOR BETTER LEVELS OF PANDEMIC PREPAREDNESS. THIS FORM OF TECHNOLOGY CAN ALSO BE CONSIDERED AS PART OF ROUTINE DELIVERY OF HEALTHCARE AND COLLECTION OF DATA.

OPINE HEALTH ASSISTANT

Opine Health Assistant is a platform that allows individuals to report symptoms of diseases that are of public health interest. The primary aim of the platform was to support the COVID-19 response in Ghana. Being a locally developed software system, the objectives of the system were largely driven by constraints on adequate access to technology within the wider population, not just the urban areas.

The Opine Platform (www.opine.world)

Opine Health Assistant was built on the Opine platform. Opine provides a complete environment to design data collection projects, and provides the tools to facilitate the analysis and visualization of the data to give users valuable insights. It also supports multi-modal deployment, allowing the same project to be deployed across different communication tools including web browsers, Android mobile apps, Telegram, Short Messaging Service (SMS) and Unstructured Supplementary Service Data (USSD). Our preference for the Opine Health Assistant was USSD, although all the other channels are still available.

Why USSD?

USSD is fairly simple to use. A user only dials a shortcode number on their mobile phone to start interacting with Opine. Fig 2 shows examples of interactions. USSD is already widely used by mobile network service providers to support services such as topping up mobile phone credits and mobile money transactions. Our primary reason for USSD was to ensure accessibility and inclusivity in the use of public health technology. Specifically,

1. It is widely accessible across the country.
2. It does not require internet access.
3. It does not incur network charges for users.
4. It works on most mobile phones, not just smartphones.

Benefits of Using Opine Health Assistant

1. Offers timely insights into the spread of the virus within communities.
2. Regular and early reporting of COVID-19 symptoms can help identify new cases early.
3. Analysis of the data will instantly flag any hotspots of potential infection that are forming, as well as highlight the pattern of spread of the virus in different parts of Ghana.
4. It can also support the tracing of contacts with infected persons.
5. The data can inform the allocation of resources in the management of the pandemic.
6. Data can be shared in real-time with health experts, data scientists and government institutions responding to the COVID-19 pandemic.
7. Can support multiple public health disease tracking projects concurrently.
8. Complements ongoing efforts by the Ghana Health Service and other stakeholders.

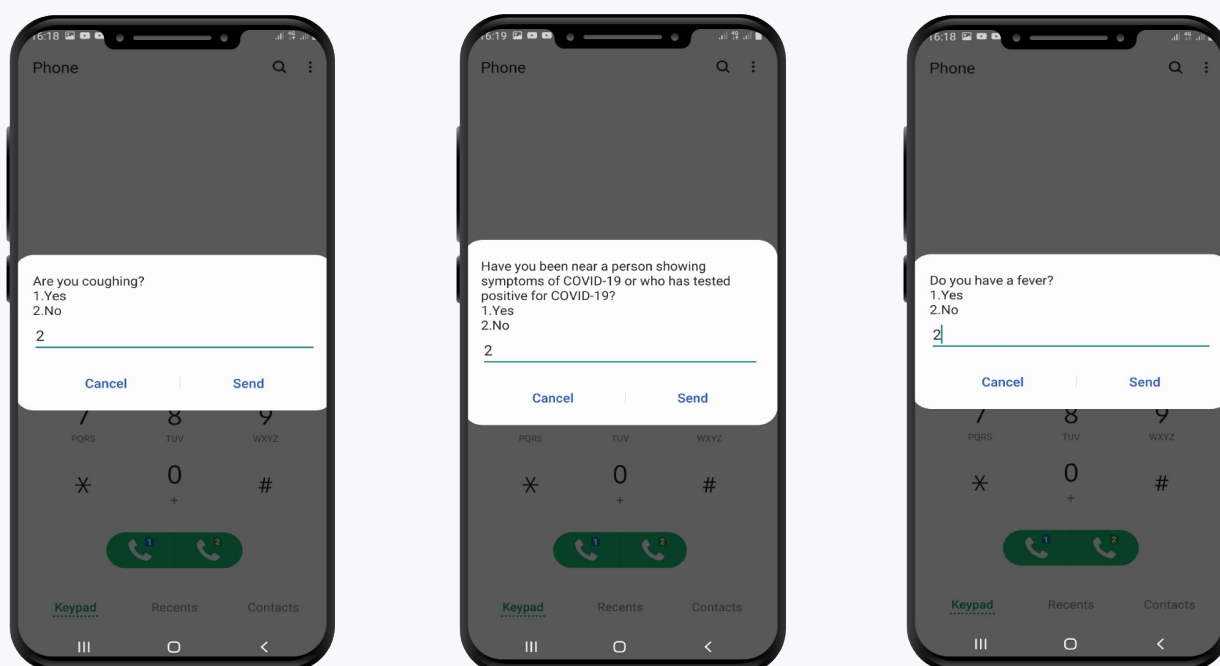


Figure 1. The USSD interface on mobile phones for questions on critical COVID-19 risk factors

Using Data from Opine

1. Visualizing the reported data on maps.
2. Use filters to view symptoms of interest across the country.
3. Create dashboards that aggregate the data and are updated in real-time.
4. Medical experts can follow up on specific reported cases using the mobile numbers of the users which are included in the submissions.

RESULTS FROM A 5-DAY PILOT OF THE OPINE HEALTH ASSISTANT IN APRIL 2020

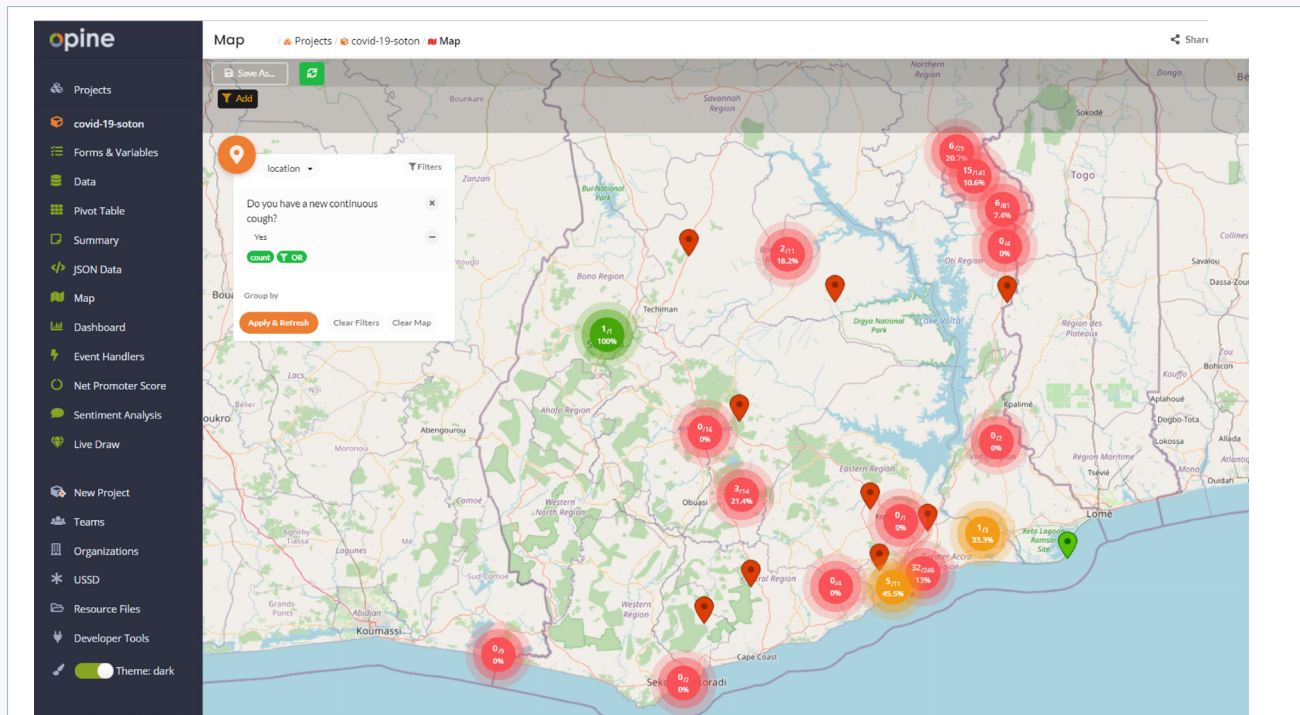


Figure 2. Distribution of symptoms in Southern Ghana

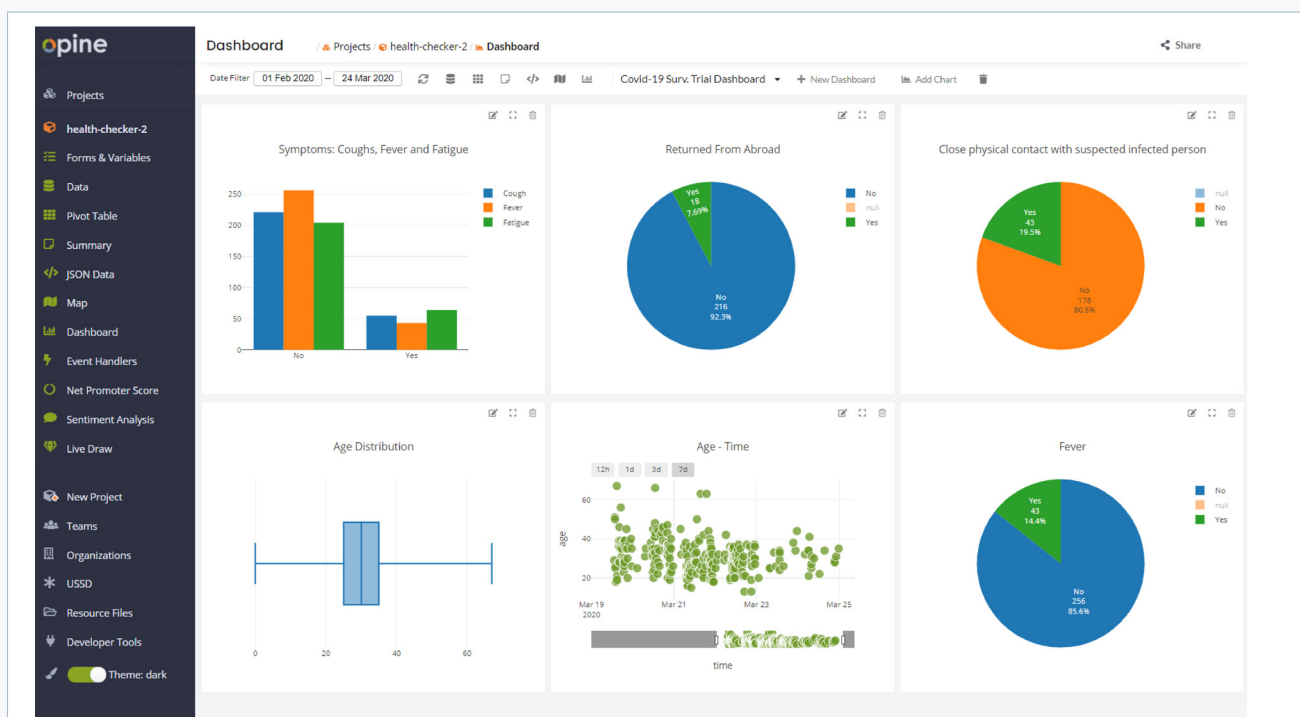


Figure 3. Live visualization dashboard of some critical risk factors

CASE STUDY

FOUR DISTRICTS IN GHANA

Opine Health Assistant was deployed across 4 districts as part of the “Urgent Covid-19 Quantitative And Qualitative Data Collection In Ghana And Togo – Supporting Pandemic Planning And Response” project. We briefly describe how it was deployed and report on preliminary data. The districts were Ashaiman and Kpone-Katamanso in Greater Accra, and Nkwanta South and Nkwanta North in Oti region. Ethical approval was obtained from the Ghana Health Service Ethics Research Committee and from the University of Southampton.

Deployment of OHA

Users dialed the USSD short code *920*900# on their mobile phones and then followed the prompts on their screen (see examples in fig 2). Users were encouraged to provide accurate information when they dialed the short code.

PRELIMINARY DATA DASHBOARDS AND SUMMARIES

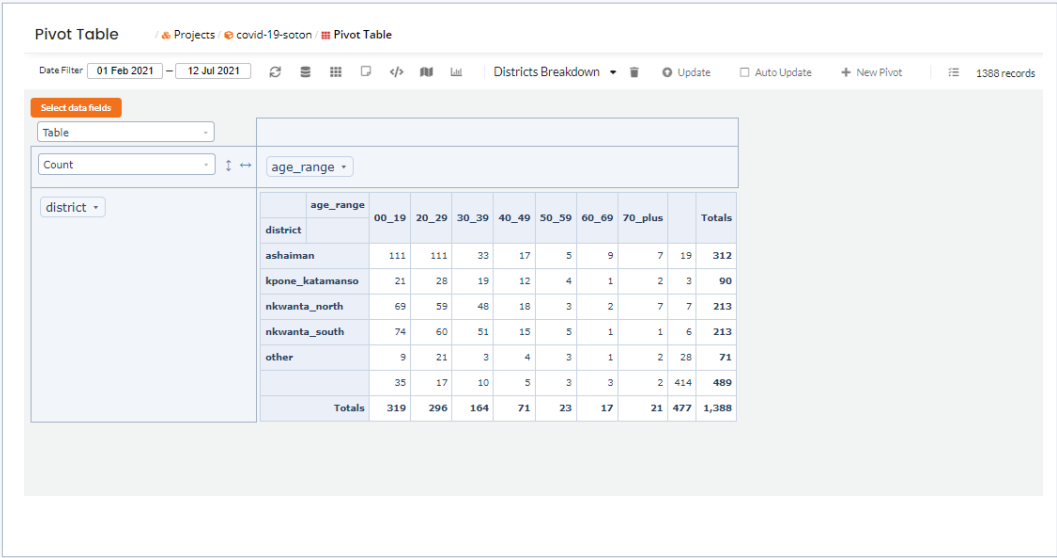


Figure 4.

Pivot Table - shows the distribution of ages across various the districts

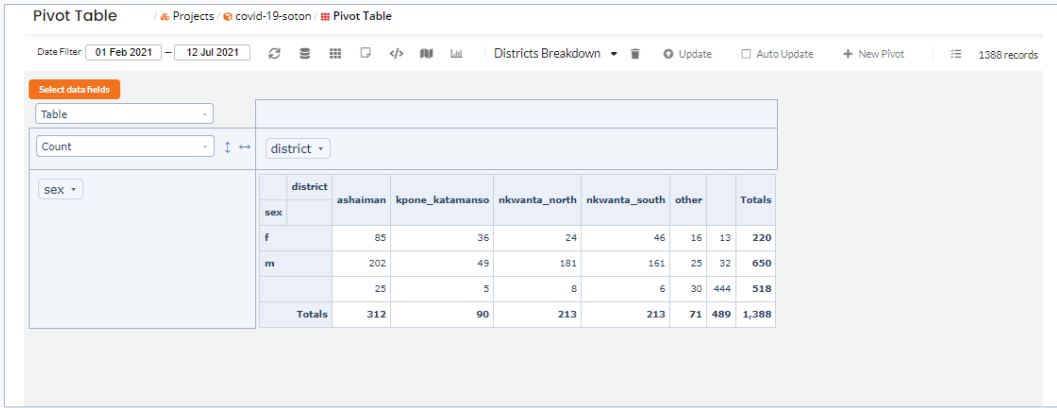


Figure 5.

Pivot Table - the gender distribution across the districts

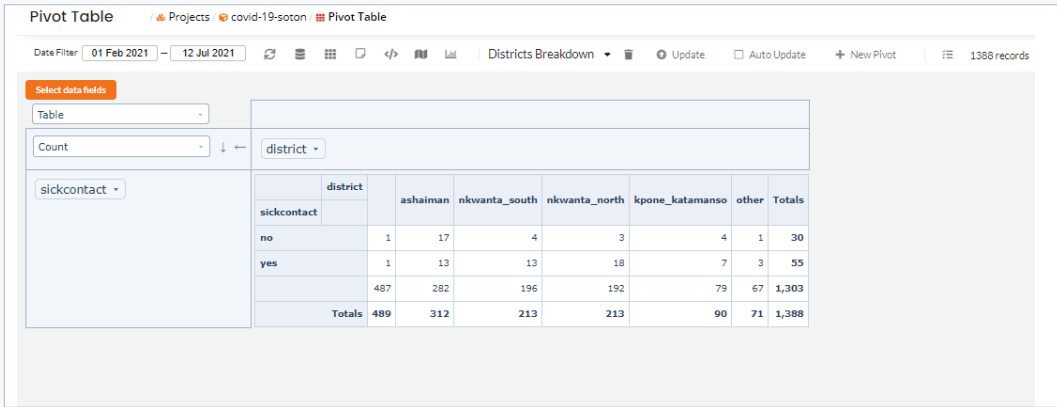


Figure 6.

Pivot Table - results regarding contact with a person exhibiting COVID19 symptoms

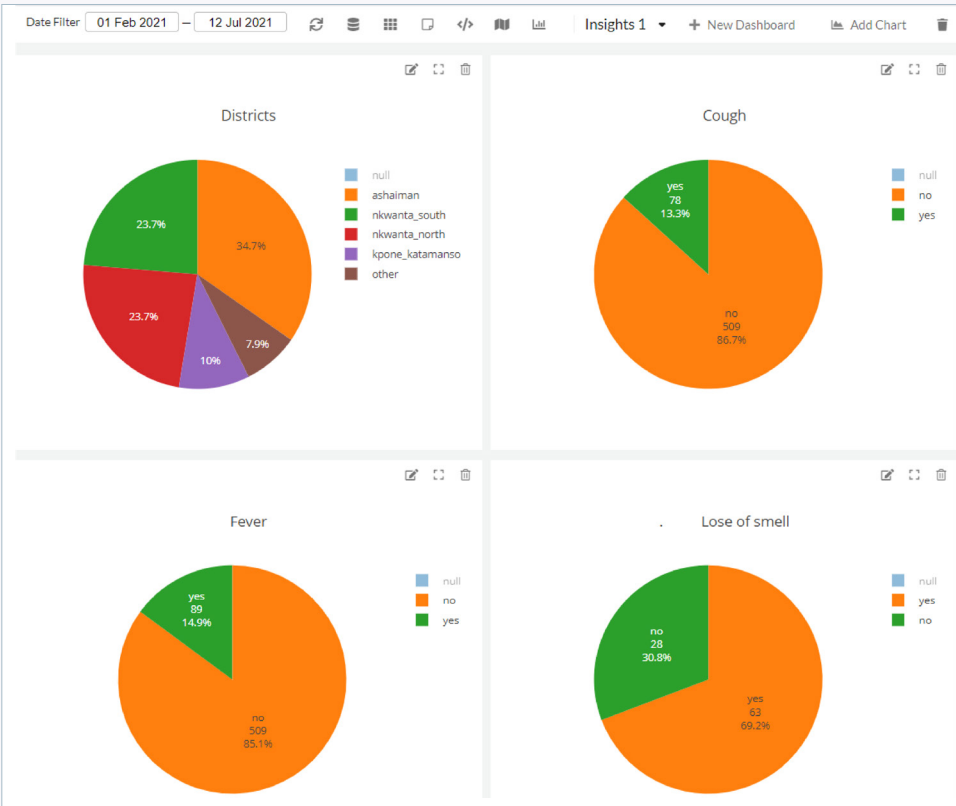


Figure 7.

Dashboard -
Results on reported COVID19 symptoms

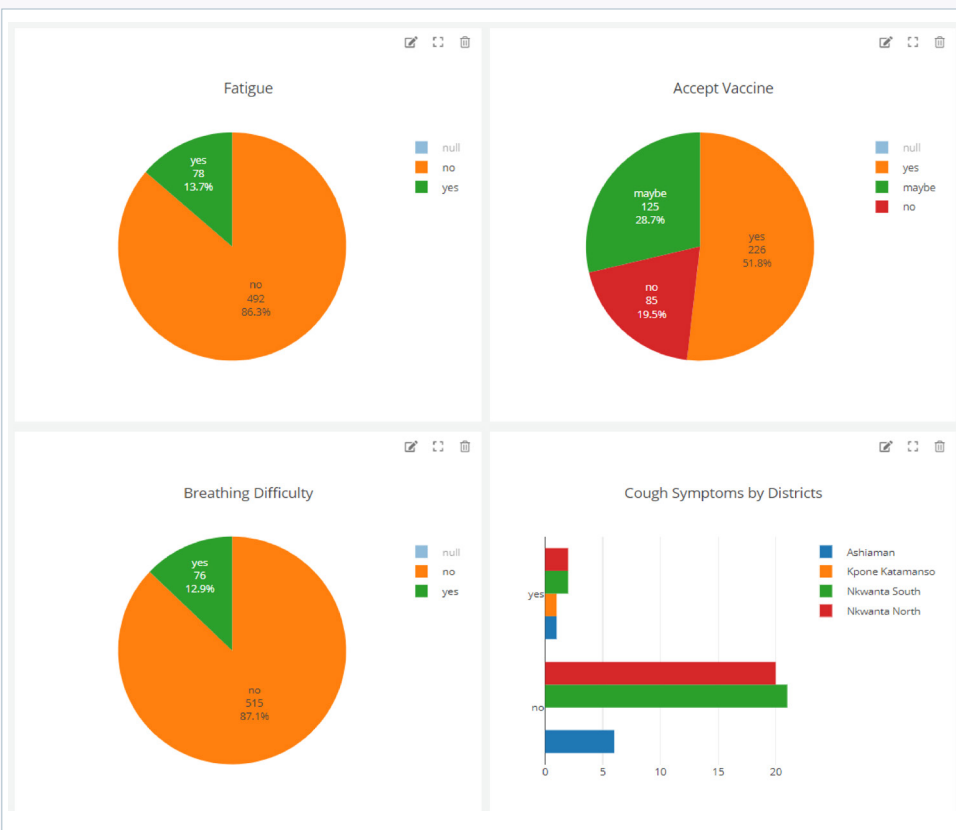


Figure 8.

Dashboard -
Results on reported COVID19 symptoms in general and districts outlook

Discussion

- Ashaiman was the highest contributing district to the study.
- Males in Nkwanta North and Ashaiman jointly contributed the most to the study.
- Millennials formed over half of the population that submitted data.
- Participants generally provided accurate information when sampled data submissions were verified

POLICY RECOMMENDATIONS

- Building capacity and proactive approaches at the national level to use crowdsourced public health data to provide different, but complementing perspectives, especially during a pandemic such as COVID-19.
- Ensure the entire population has appropriate access to novel technology, including rural and hard-to-reach groups. While web-based software is widespread, it is important to acknowledge that not everyone has access to it. It is therefore necessary to ensure that public-facing software for public health can be accessed through more widely accessible technology such as USSD, to complement other technologies adopted.
- Equipping the national DHIMS system to access, ingest or link to data from other trustworthy sources, including private enterprises. This can be done in a form of “data-partnership” with the Ghana Health Service.
- Need to be nimble and flexible in a rapidly changing environment such as COVID-19. Opine allows the focus of the public health data collection to be adapted as pandemic evolves. Question on symptoms changes as guidance from WHO evolved almost instantly. Traditional means of data collection using paper suffers a significant lag in such situations.
- Young people are normally early adopters to technology. It is therefore important to intentionally utilize them as a strategic resource in advocacy and training within their communities with respect to the use of health related technology.

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In collaboration with





For more information

<https://opine.world/>

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