Solving for Dengue epidemics

Theme: **Design for Crisis**
Rebuild and heal the world with design

23rd July 2022

Team

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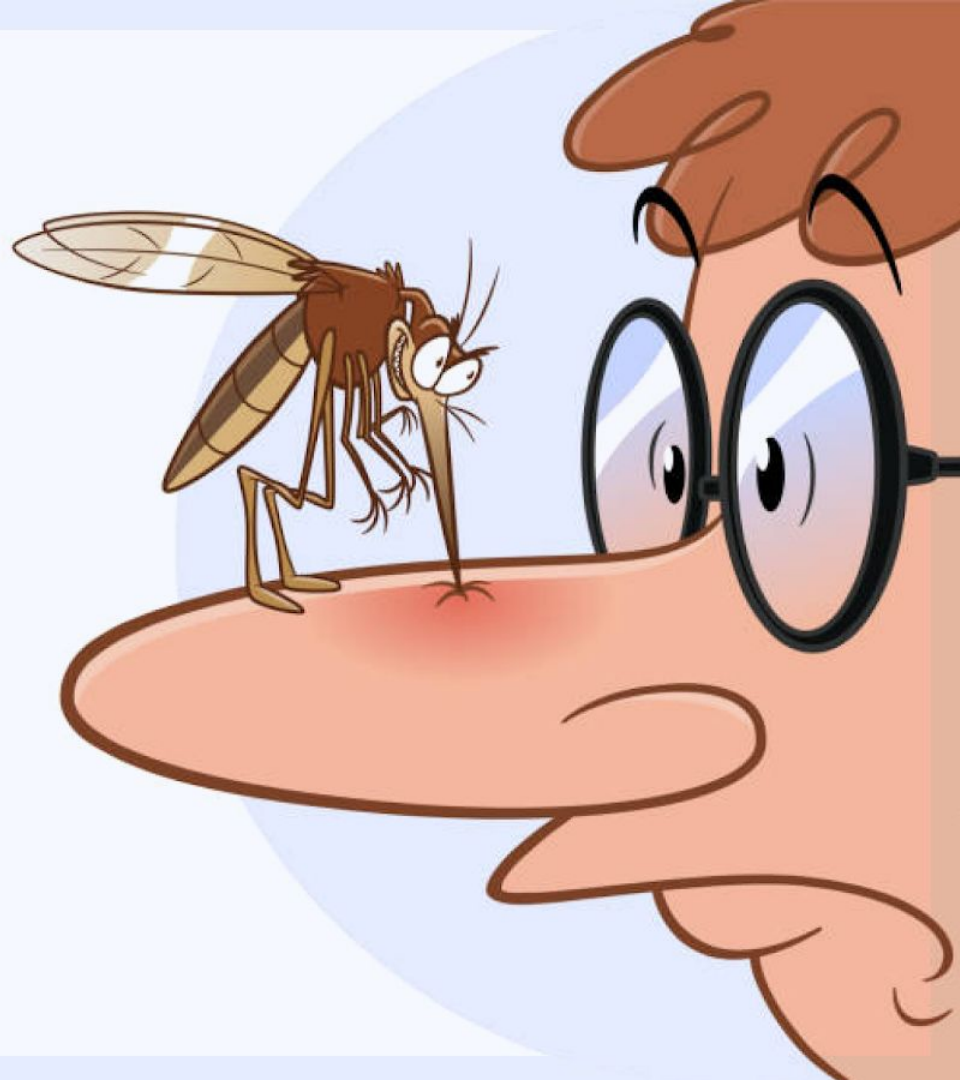
Pranoti Sonawane
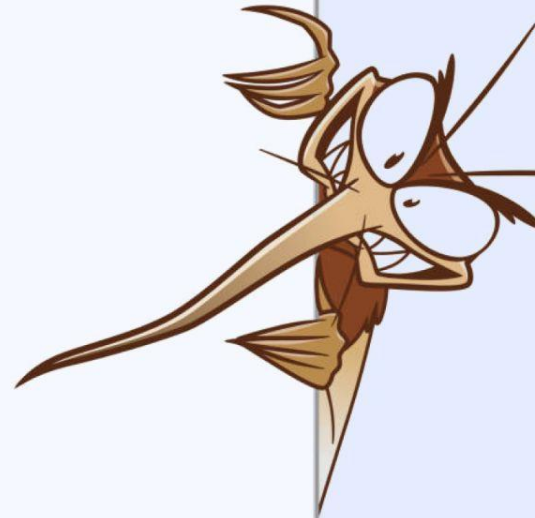Experience Designer

No one in this world is insignificant.

Especially Mosquitos

- Mosquitoes may be small, but they are most dangerous creature on the planet.

- These flying parasites carry and transmit major diseases like *dengue* to humans, accounting for *millions of infectons* every year.

The Dreadful Dengue

- Dengue is caused by the bite of an infected female *Aedes aegypti* mosquito.

- It is the **fastest spreading, epidemic-prone** infectious disease, putting half of the world's population at risk.

The Dreadful Dengue

Population at Risk
4 Billion

In more than
128 Countries

Infections per year
400 Million

Dengue Kills One Person Every 12 Minutes

1 person

12 minutes

Symptoms of Dengue Fever

Rash.

Intense pain behind your eyes.

Nausea or vomiting.

Muscle, bone and joint pain.

Warning Signs of Severe Dengue Fever

Abdominal pain.

Frequent vomiting.

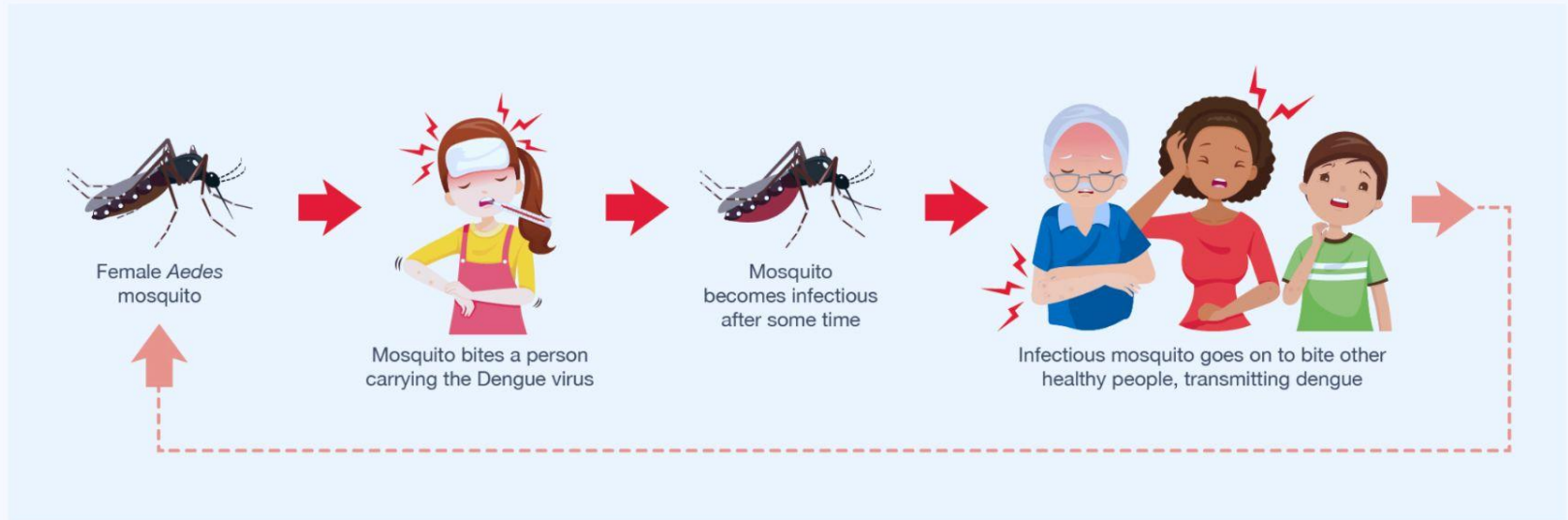Throwing up blood or blood in your poop.

Nose bleeds or bleeding gums.

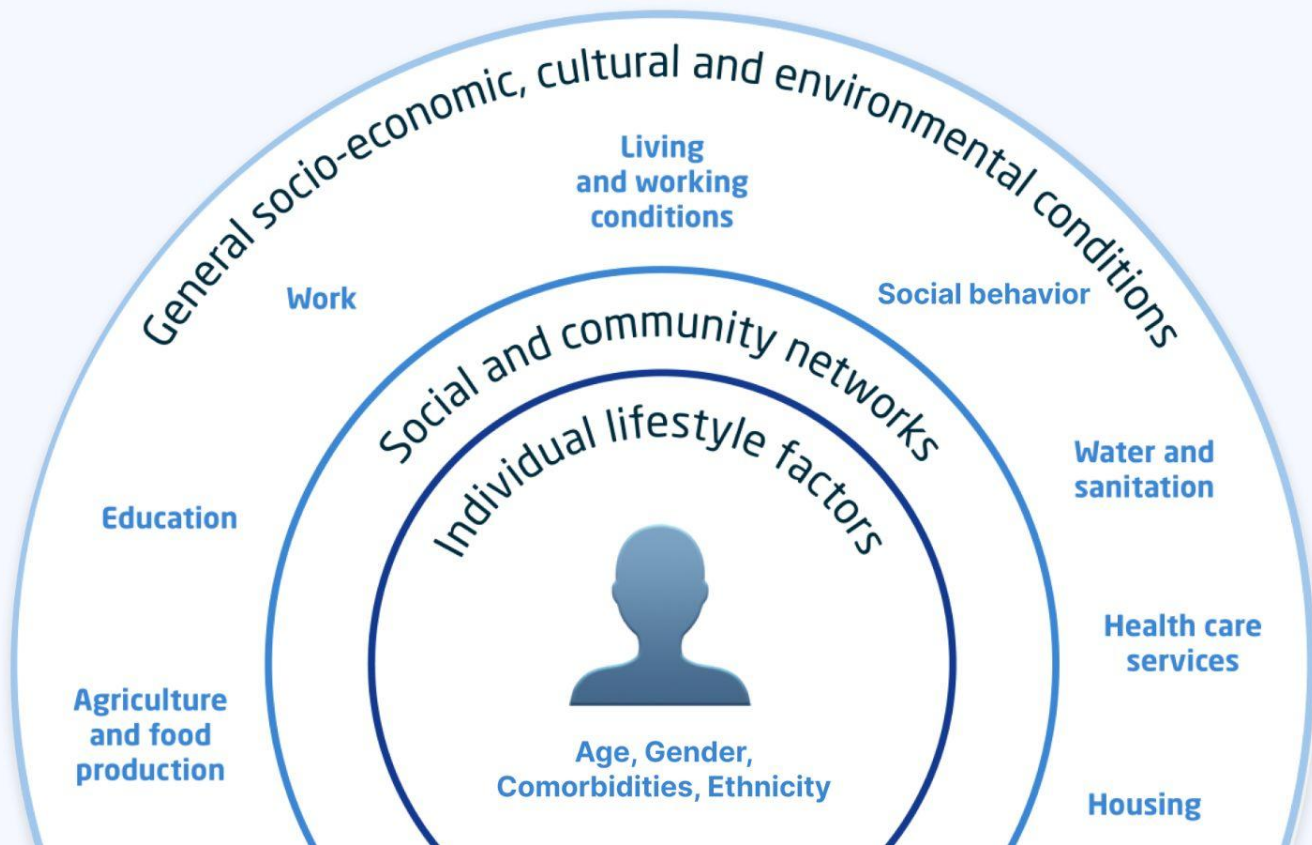Extreme tiredness, restlessness or irritability.

Dengue spreads socially

The dengue carrying mosquito is highly adapted to urban living and humans are presumed the main cause of spread of dengue between communities.
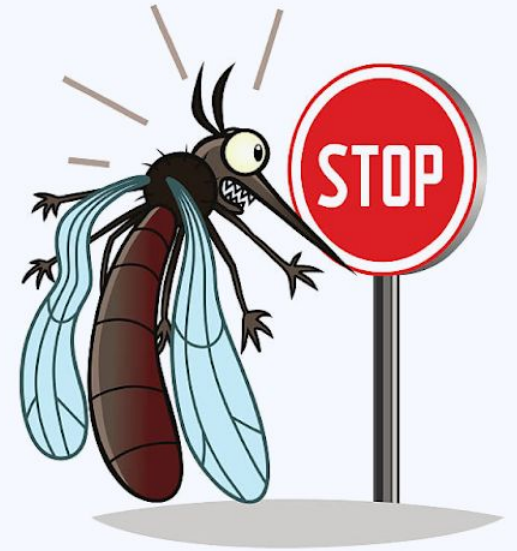

Female *Aedes* mosquito

Mosquito bites a person carrying the Dengue virus

Mosquito becomes infectious after some time

Infectious mosquito goes on to bite other healthy people, transmitting dengue

Social and Environmental Factors of Dengue Severity

General socio-economic, cultural and environmental conditions

Living and working conditions

Work

Social behavior

Social and community networks

Individual lifestyle factors

Education

Water and sanitation

Agriculture and food production

Health care services

Age, Gender, Comorbidities, Ethnicity

Housing

Opportunity

'How might we reduce dengue mortality and provide timely and appropriate care by analysing the social determinants?'

Challenges & Myths

🦟 *"It is difficult to constantly keep the environment clean and free of **mosquito breeding sites**."*

🧹 *"Even if we keep our **houses clean**, the neighbours or people around might not keep it the same."*

🤔 *"Because I am an athlete with a strong immune system **I am safe!** It is riskier for the elderly and kids."*

🤒 *"If it's **just a fever**, I'd take paracetamol. If I heard of dengue fever near me, I would get myself checked for dengue."*

Laidback Lokesh

An unaware citizen in a dengue prone area

PROFILE & DEMOGRAPHICS

Health Seeking Behavior: Low
Lives in: Densely Populated Area
Income: Lower & Middle Economic Group
Carefulness: Low

FEELINGS

I am safe! Because I am an athlete with a strong immune system. It is riskier for the elderly and kids.

If it's a fever, I'd take paracetamol. If others are affected, then I'll get tested.

GOALS & VALUES

Quick medical attention when disease is detected

To maintain healthy environment around me

Get the facilities/attention whenever im affected

PAIN POINTS

How do we ensure cleanliness in the environment?

People cannot make out the difference between fever and dengue fever.

People affected don't seek quick medical attention and their health degrades..

Explorations
Ideas & Solutions

Identifying and Tracking Sources
ASEEM ASEEM

Agent - Sources

External
- Click photo + co-ordinates location tagging of external sources
- Education and knowledge of what sources are, and where to look for them

Internal
- Education and knowledge of what spaces/items in your home can be a source for breeding from where individual can identify

ASEEM ASEEM

Agent - Community
- Identifying sources in nearby vicinity and area and notifying people of the severity of the problem
- Campaigns to make people aware about the sources at their home
- Maintain cleanliness in environment

ASEEM ASEEM

Agent - Govt. Municipal

External
- From Public camera tag potential sources through image processing
- Garbage Truck - Kachra Gaadi
- Survey
- AI-based image detection from photos being uploaded from certain areas.

Internal
- Survey

ASEEM ASEEM

Healthcare System
- Analyse which patients are coming in from which area, location, family, + other determinants and figure out the hotspots/sources

ASEEM ASEEM

Health System Preparedness - Platelets etc.
ASEEM ASEEM

Agent - Individual
- Alternative resources
- Notify and onboard to donate platelet

ASEEM ASEEM

Agent - Community
- Sharing resources with needful

ASEEM ASEEM

Healthcare System
- Depending upon scarcity
- Depending on other hospitals and platelets collection centre
- Onboarding Donors for platelet

ASEEM ASEEM

Agent - Govt. Municipal
- Predicting the resources before need

Early Warning and Notification
ASEEM ASEEM

Agent - Individual
- Severity rating for my selected areas, very early.
- Sending alerts based on climate, previous year trends and trend forecasting data
- Whenever i enter an area which has high severity rating or when I come in vicinity of a hotspot, I get a notification (reference from Arogya setu)
- Regular notifications to remind of preventative measures

ASEEM ASEEM

Healthcare System
- No. of Dengue cases in any
- Severity of dengue
- Data center/ Provider
- Inventory management insights
- Resource sharing between other healthcare bodies

ASEEM ASEEM

Agent - Govt. Municipal
- No. of Dengue cases in country, state
- Data Provider
- Resources, Inventory management
- Scarcity of resources

ASEEM ASEEM

Agent - Community
- Shared data, Announcement, information display at public spaces
- Data API access which can be superimposed on any services.

ASEEM ASEEM

Taking Preventative Measures
ASEEM ASEEM

Agent - Individual

Internal
- Regularly clean and maintain cleanliness to avoid dengue
- Checklist and task to reduce your vulnerability score.
- Level and Badges - based on best practices

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Healthcare System
- Taking precaution (virus does not transmit to people from patient)

ASEEM ASEEM

Agent - Community
- Social Media Campaign
- Fun Challenges

ASEEM ASEEM

Agent - Govt. Municipal
- Fogging machine
- Guppy fish
- Sterlize
- Empower garbage disposal teams

ASEEM ASEEM

Vulnerability and Risk Assessment
ASEEM ASEEM

Agent - Individual
- Based on SD, HS data → Vulnerability score.
- AI image based assessment
- Risk assessment according to your vicinity, area, country
- Review risk and improve your score

ASEEM ASEEM

Healthcare System
- Risk score based upon resources availability

ASEEM ASEEM

Agent - Govt. Municipal
- Risk score based upon resources availability

ASEEM ASEEM

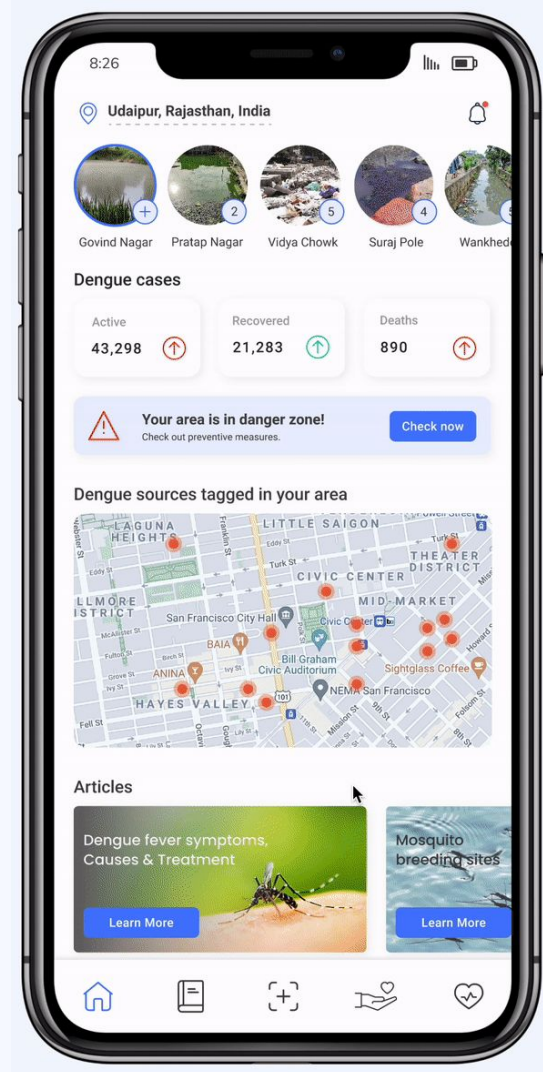Health | Education | Identification of Sources | Municipal work | Social Awareness | Prediction | Data | Actionable Notification

Innovation

Identifying and tracking breeding sources

Optimizing Resource Distribution

Educating People and Health Professionals

Vulnerability Assessment based on Social Determinants

Early Warning and Notification of Outbreak

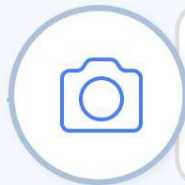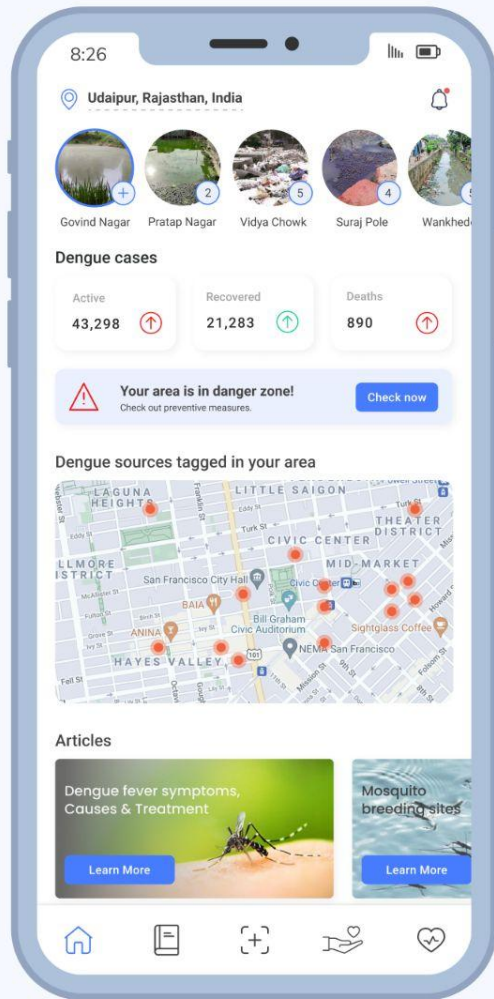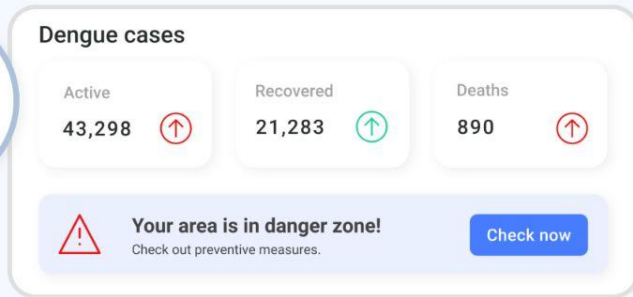Health Recommendations based on social determinants
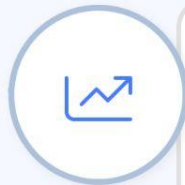
VectoRide App

- Geo-tag breeding sources and unclean areas around you.

- Government, communities can track tagged locations and take preventive measures.

- Our app recommends dengue prevention strategies based on your health data and analyse risk.

- Quizzes, articles, and health professional videos help educate users.

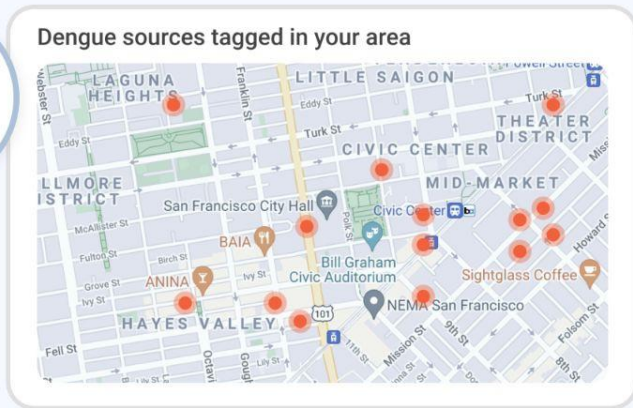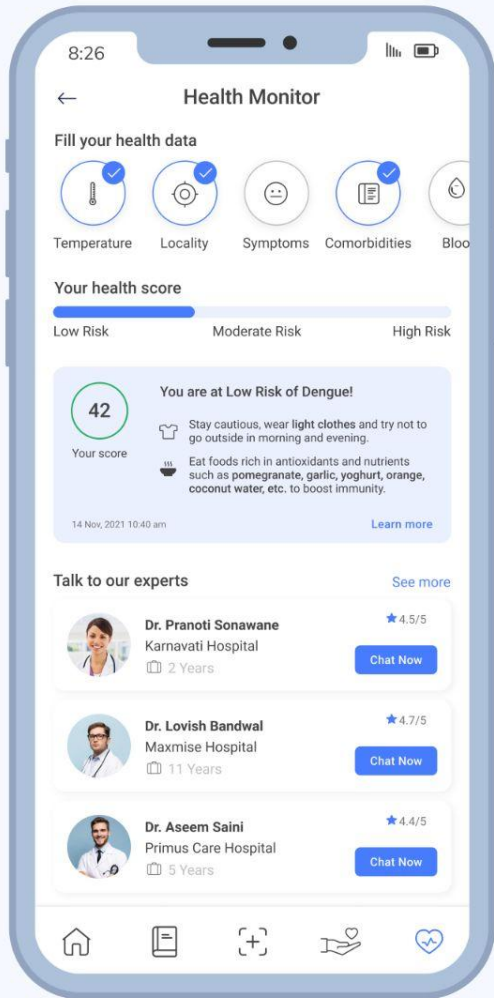- Donate platelets, blood, money, etc. and join communities to help the needy.

8:26

Udaipur, Rajasthan, India

Govind Nagar | Pratap Nagar | Vidya Chowk | Suraj Pole | Wankhed...

Dengue cases

Active	Recovered	Deaths
43,298 ↑	21,283 ↑	890 ↑

⚠ **Your area is in danger zone!**
Check out preventive measures.   **Check now**

Dengue sources tagged in your area

Articles

Dengue fever symptoms, Causes & Treatment
Learn More

Mosquito breeding sites
Learn More

Govind Nagar | Pratap Nagar | Vidya Chowk | Suraj Pole | Wankhed...

*Click a photo of a water puddle in your community and **tag the puddle** with its geo-location*

Dengue cases

Active	Recovered	Deaths
43,298 ↑	21,283 ↑	890 ↑

⚠ **Your area is in danger zone!**
Check out preventive measures.   **Check now**

*We give a dengue **cautionary rating** for the user's nearby area based on active dengue cases, recovered and death rate.*
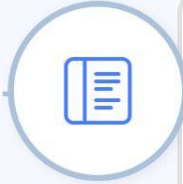
Dengue sources tagged in your area

*We give a **heatmap visualisation** of all mosquito breeding sources tagged around one's nearby location.*

Health Monitor

Fill your health data

Temperature · Locality · Symptoms · Comorbidities · Bloo...

Your health score

Low Risk · Moderate Risk · High Risk

42
Your score

You are at Low Risk of Dengue!

Stay cautious, wear **light clothes** and try not to go outside in morning and evening.

Eat foods rich in antioxidants and nutrients such as **pomegranate, garlic, yoghurt, orange, coconut water, etc.** to boost immunity.

14 Nov, 2021 10:40 am

Learn more

Talk to our experts · See more

Dr. Pranoti Sonawane
Karnavati Hospital
2 Years
★ 4.5/5
Chat Now

Dr. Lovish Bandwal
Maxmise Hospital
11 Years
★ 4.7/5
Chat Now

Dr. Aseem Saini
Primus Care Hospital
5 Years
★ 4.4/5
Chat Now

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*Users can input their health data in our **AI health monitor** which'll provide them a **score** based on their health markers*

*AI health monitor gives user a risk rating based on their health markers and provide them with **actionable preventative care recommendations** to get to a better score & decrease their risk*
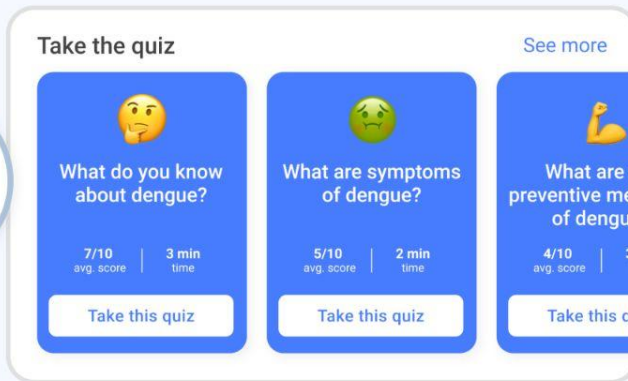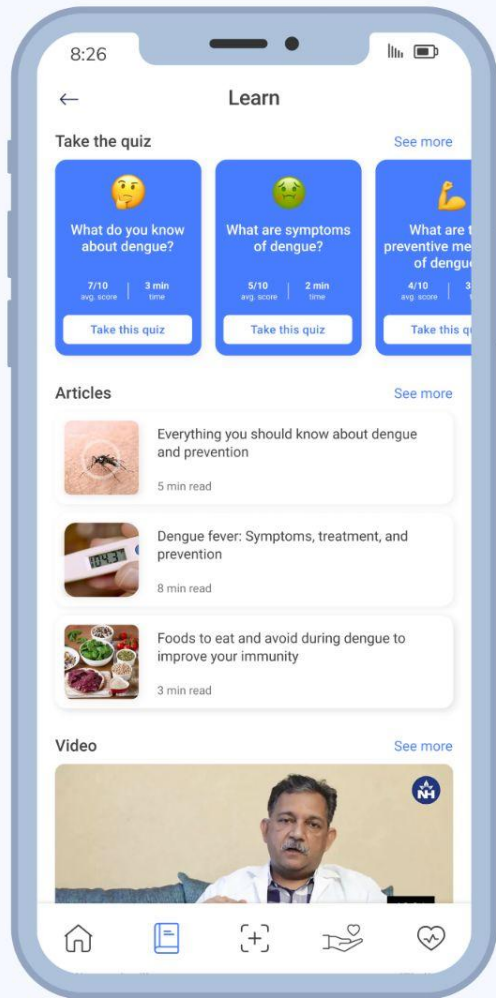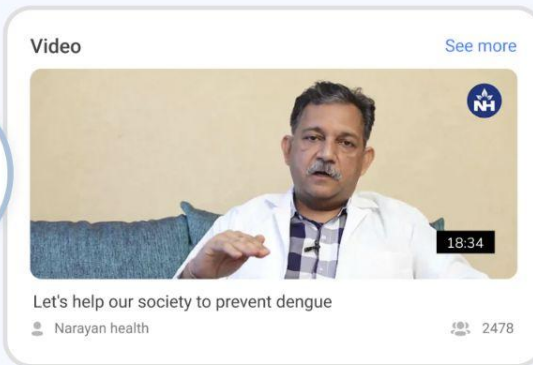
*Enabling **telecommunication** with healthcare providers so users can take **expert advise** for better health outcomes*

Take the quiz — See more

What do you know about dengue?
7/10 avg. score | 3 min time
Take this quiz

What are symptoms of dengue?
5/10 avg. score | 2 min time
Take this quiz

What are the preventive measures of dengue?
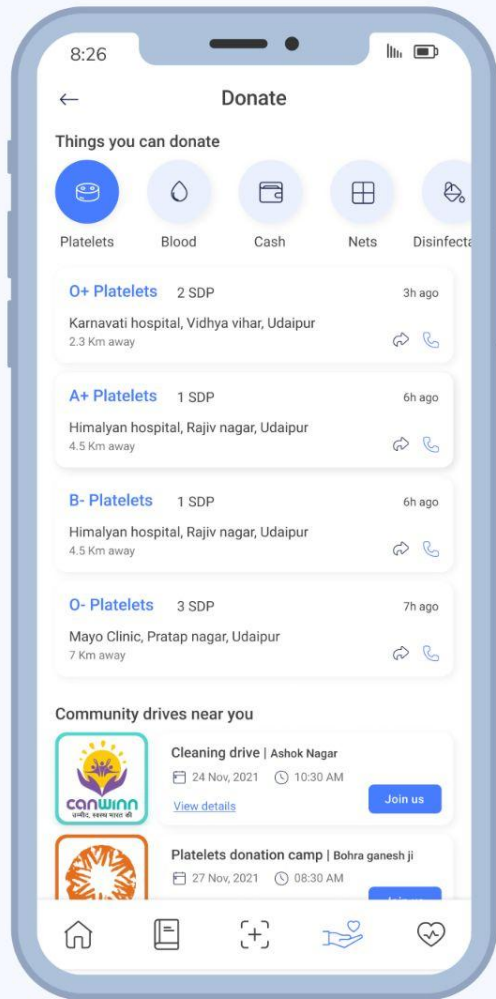4/10 avg. score | 3
Take this qu

Fun & Engaging health quizzes that users can take individually or with friends to **bust widely spread myths** and gain knowledge leading to better care
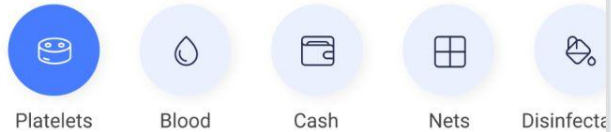
Articles — See more

Everything you should know about dengue and prevention
5 min read

Creating a space where high quality health articles from most trusted sources are collated. So users access the **best sources of information**

Video — See more

Let's help our society to prevent dengue
Narayan health — 2478
18:34

Collating Video content by trusted sources. Provide **multimodal content** to satisfice needs of a diverse user base

Place where users can help & **contribute** to the larger community through **individual donations** e.g platelets, blood, monetory etc.

Community drives that a user can take part in, users can create their own drives or **join an org's drive** to volunteer & contribute. e.g **Blood Platelets donation camps**, Cleaning Drives

We'll share the Data to our App to Government Bodies & Healthcare Providers to help them with tracking the spread of disease, oversee population health and optimize resource distribution to eradicate the spread.

Impact

- Through our ecosystem, we would be able to reduce the dengue outbreaks to near zero with the **help of clinical data**.

- Our platform allows Hospitals and Govt bodies to monitor dengue outbreak and **allocate resources in an optimised manner.**

- Dengue severity will reduce by providing health scores and recommendations to people. By **educating people** and informing them with **early warnings.**

Sustainability

- Our solution can be **scaled and utilised** for other vector borne diseases e.g Zika, Chikunguniya, Yellow Fever, Malaria etc.

- Promotes **cleanliness in communities** & homes leading to less cumulation of mosquito breeding zones

- **Improves health education** & seeking behavior in individuals & communities and makes them better prepared to fight an outbreak

- **Early outbreak detection and forecast** so entities can curb the outbreak from spreading in early stage

- Enables **optimal resource distribution** amongst healthcare providers

3 GOOD HEALTH AND WELL-BEING

6 CLEAN WATER AND SANITATION

11 SUSTAINABLE CITIES AND COMMUNITIES

SDGs we are targeting

Business Model

Value Propositions

- **Scalable platform** for other diseases
- Timely recognition of outbreaks
- **Estimate the spread** of disease

Customer Segments

- Two-sided marketplace
- Civil Population
- Healthcare Providers
- Government Bodies & Agencies

Revenue Streams

- Sales of forecasted information
- Public Private Partnerships
- Service ads by Insurance companies

VECTORIDE

$3 Billion
dengue economic cost in India

$2300
recovery cost per person

→ **~$0**

624 Million
Internet Users
(61% of population)

$6.5 Billion
Digital healthcare market in 2024 (CAGR 27%)

40%
Growth in Amount spent on In-App Advertisement

Thank You!!

Aseem Saini

Lovish Bandwal

Pranoti Sonawane

VECTORIDE