# Social Media and novel data sources: Opportunities for digital public health

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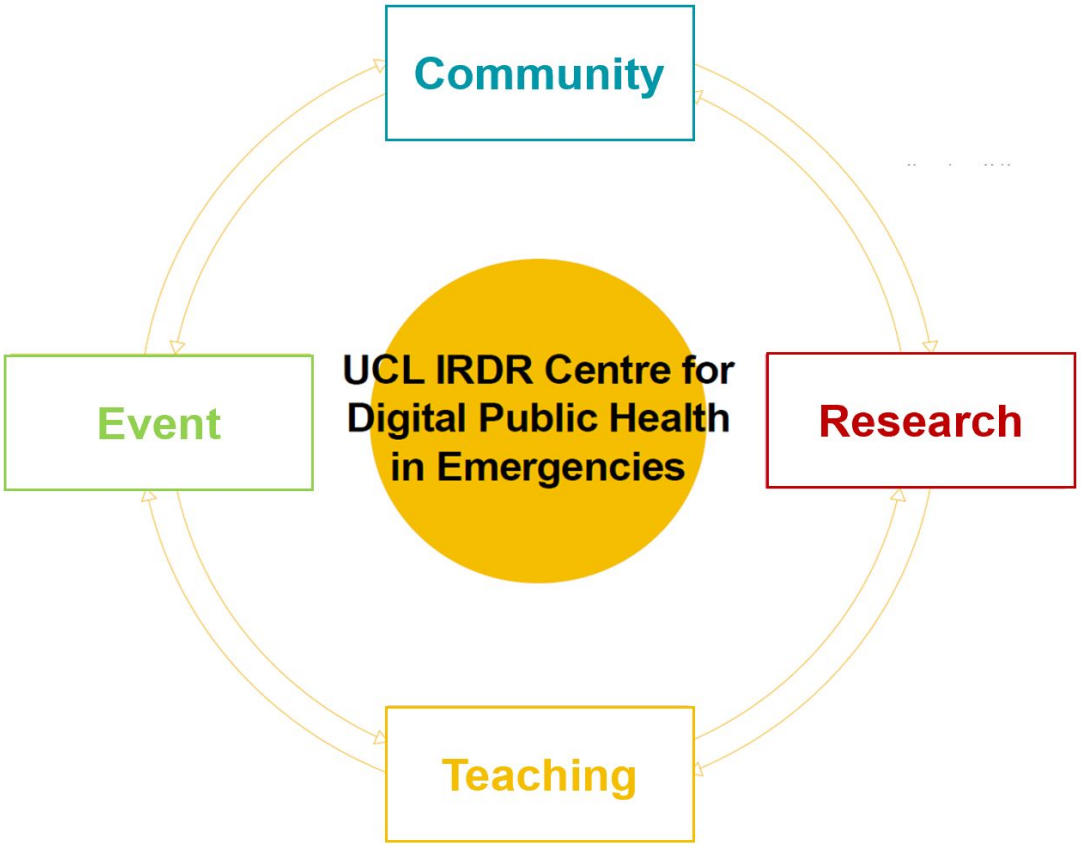
# UCL dPHE Centre Vision

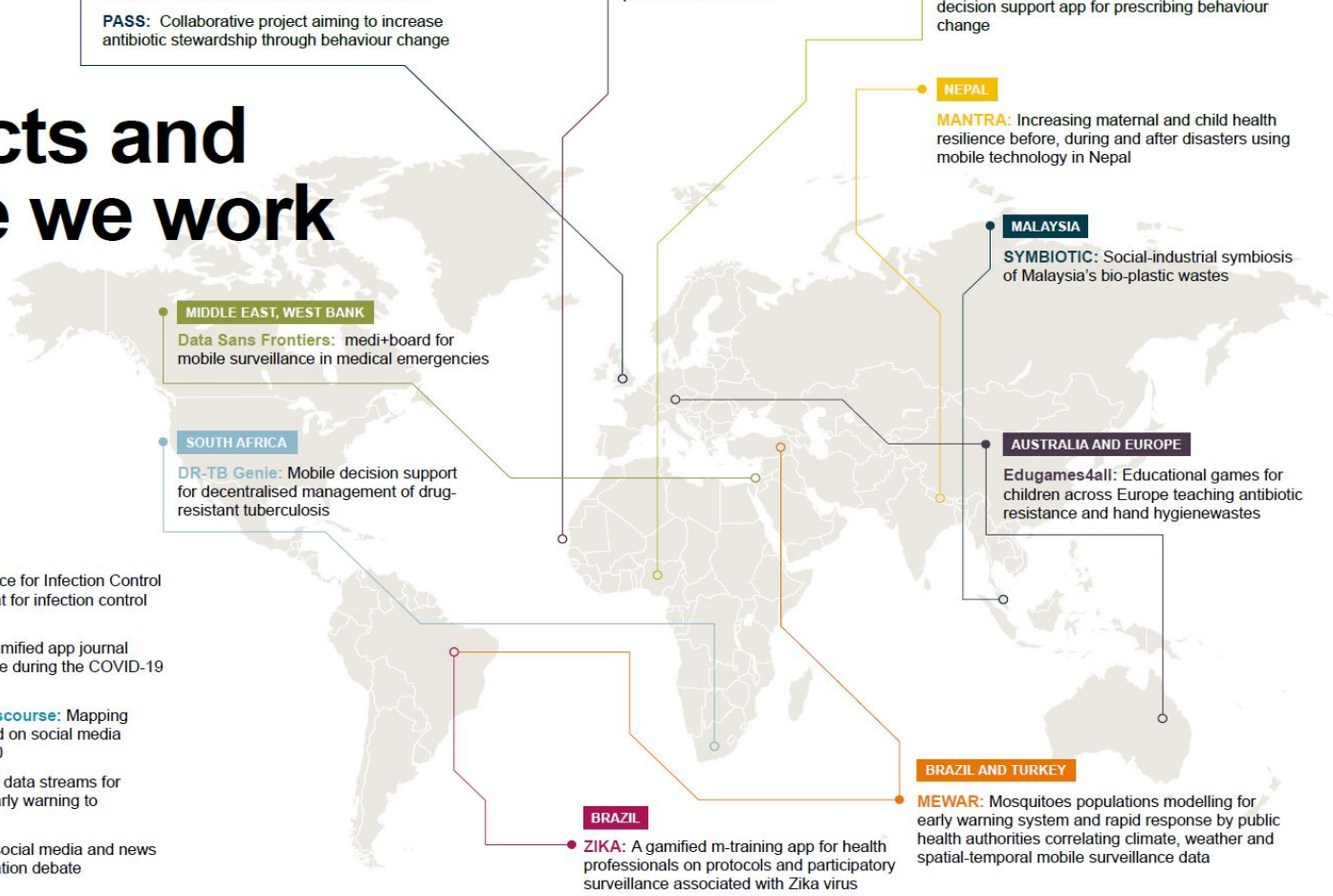



## OUR MISSION

- Cutting Edge Digital Innovations
- Strengthening global capacity, preparedness
- Responding to public health emergencies

# UCL dPHE International Network

## Projects and where we work



**UNITED KINGDOM**

**Adaptation of GADSA for UK settings:** A mobile gamified antimicrobial stewardship decision support app for prescribing behaviour change

**PASS:** Collaborative project aiming to increase antibiotic stewardship through behaviour change

**AFRICA**

**NRIC meets ICAN:** Understanding information needs of infection control practitioners in Africa

**NIGERIA**

**GADSA:** A gamified antimicrobial stewardship decision support app for prescribing behaviour change

**NEPAL**

**MANTRA:** Increasing maternal and child health resilience before, during and after disasters using mobile technology in Nepal

**MALAYSIA**

**SYMBIOTIC:** Social-industrial symbiosis of Malaysia's bio-plastic wastes

**MIDDLE EAST, WEST BANK**

**Data Sans Frontiers:** medi+board for mobile surveillance in medical emergencies

**SOUTH AFRICA**

**DR-TB Genie:** Mobile decision support for decentralised management of drug-resistant tuberculosis

**AUSTRALIA AND EUROPE**

**Edugames4all:** Educational games for children across Europe teaching antibiotic resistance and hand hygienewastes

**WORLDWIDE**

- **iNRIC:** International Resource for Infection Control providing single access point for infection control guidelines and information
- **#MyLockdownJournal:** Gamified app journal documenting lifestyle change during the COVID-19 pandemic in 2020
- **COVID-19 social media discourse:** Mapping trends and key terms shared on social media during the pandemic in 2020
- **Medi+Board:** Dashboard of data streams for modelling, prediction and early warning to outbreaks and epidemics
- **Medi+Vac:** Understanding social media and news coverage of the anti-vaccination debate

**BRAZIL AND TURKEY**

**MEWAR:** Mosquitoes populations modelling for early warning system and rapid response by public health authorities correlating climate, weather and spatial-temporal mobile surveillance data

**BRAZIL**

**ZIKA:** A gamified m-training app for health professionals on protocols and participatory surveillance associated with Zika virus

# UCL dPHE Awards


UCL
IRDR dPHE

**Congratulations UCL Centre for Digital Public Health in Emergencies – University College London**

**"The overall impression is a team that enjoys and takes great pride in what it does."**

# Awards and Prize

**COMPUTING RISING STAR AWARD 2020**

- **Won - Team of the Year 2020 -** UCL dPHE
- **Highly Commended:** Georgiana Birjovanu

**DPH 2019 -INNOVATION PRIZES**

- **Runner-up**: Caroline Wood for GADSA & Georgiana Birjovanu for Zika

**COMPUTING WOMEN IN IT EXCELLENCE**

- **Innovator of the Year** (Winner 2019 and 2020 Prof. Patty Kostkova)
- 5 Finalist nominations 2017-20

**DPH 2018 INNOVATION PRIZES**

- Nomination for **Best Partnership**: Patty Kostkova on behalf of the MANTRA project team

**UK IT INDUSTRY AWARDS 2020**

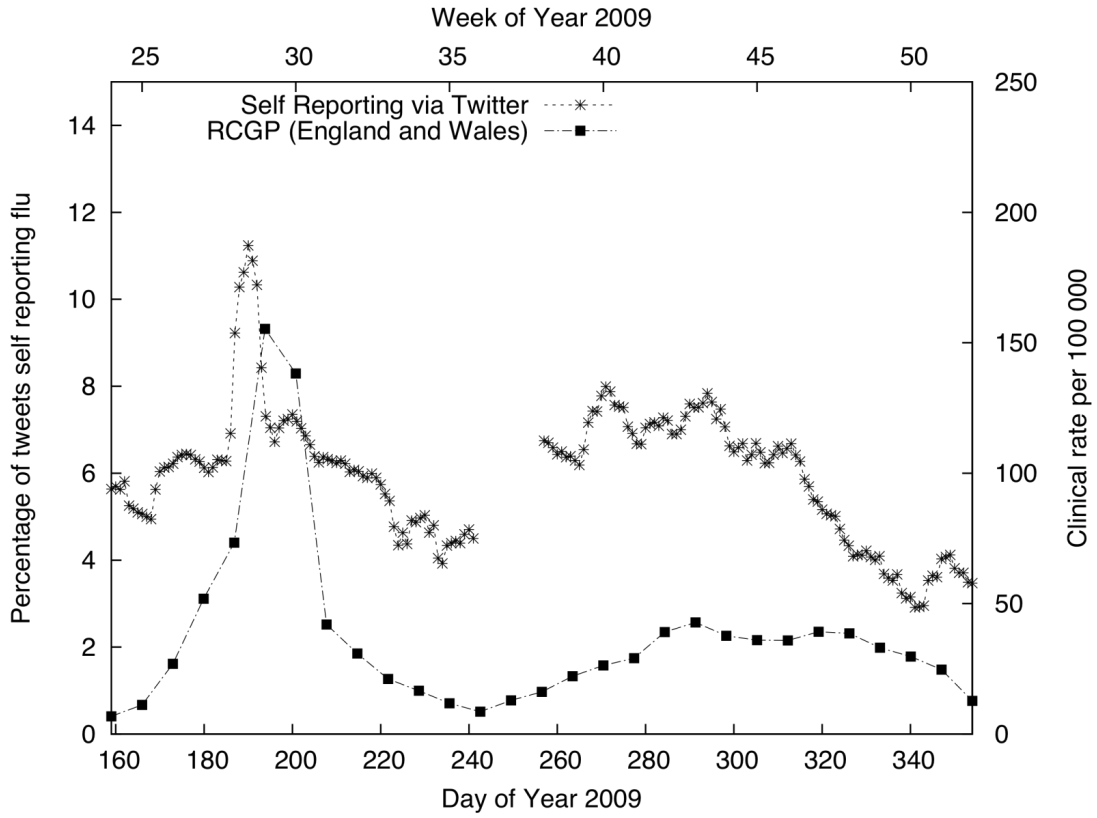
- **'Highly Commended 2020'** in the category of 'Healthcare project of year' – GADSA



# Theme 1: Social Media Predicts Pandemics

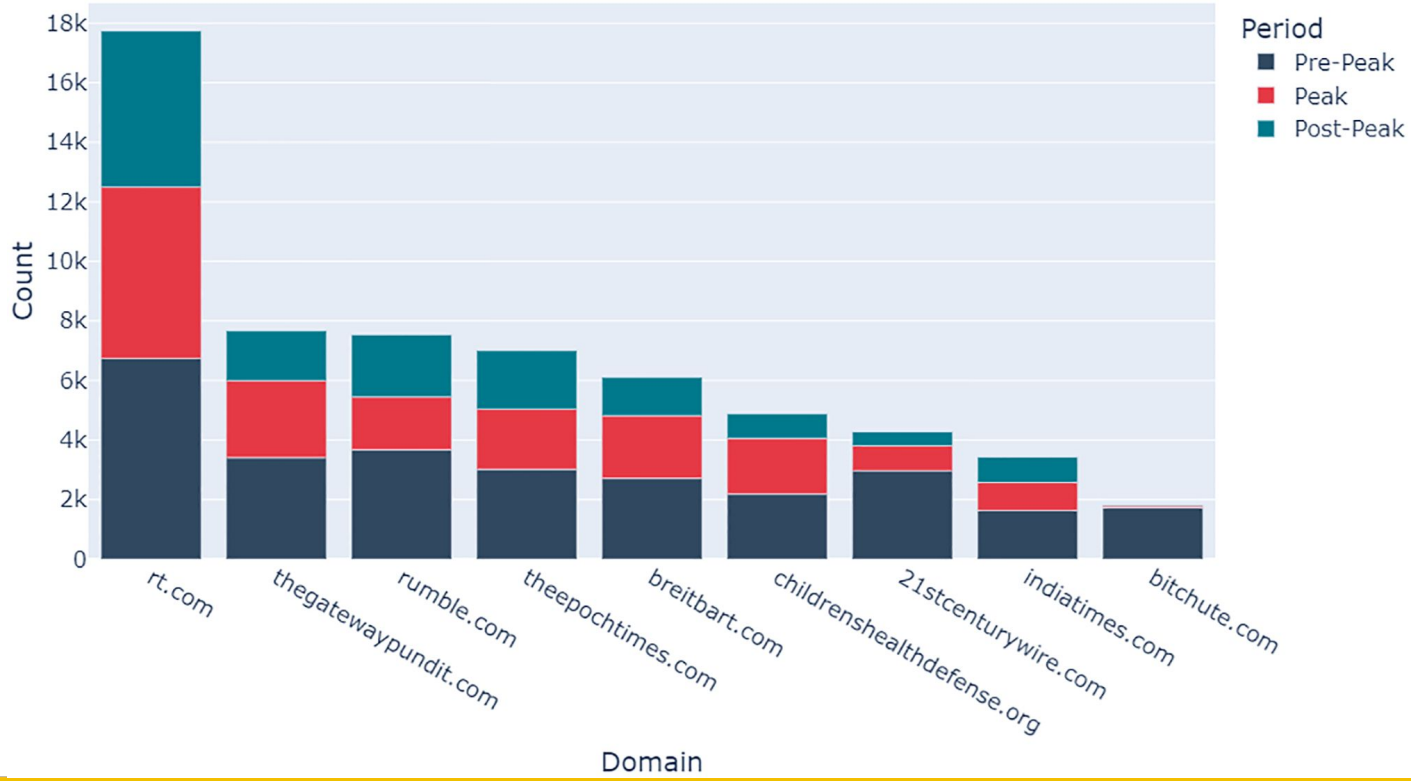
- 2009 Twitter Epidemics finalist: BMJ ‘ Idea to Change healthcare by 2020’ (2011 BMJ)
- https://www.youtube.com/watch?v=_JNogEk-pnM

# Twitter 2009: Early Warning and Outbreak Prediction



# Analysis of low credibility tweets

- media coverage linking the AZ vaccine to blood clots peaked in the UK (11th– 17th March 2021)



# PEARL SM challenges

## Regulatory and Legal

- Lack of regulatory frameworks for SM tech giants
- Little enforcement of transparency and removal of harmful content
- access to datastreams could be switched off with no warning (as we saw with X)

# Theme 2: Participatory Surveillance Zika Virus in Brazil and Madeira

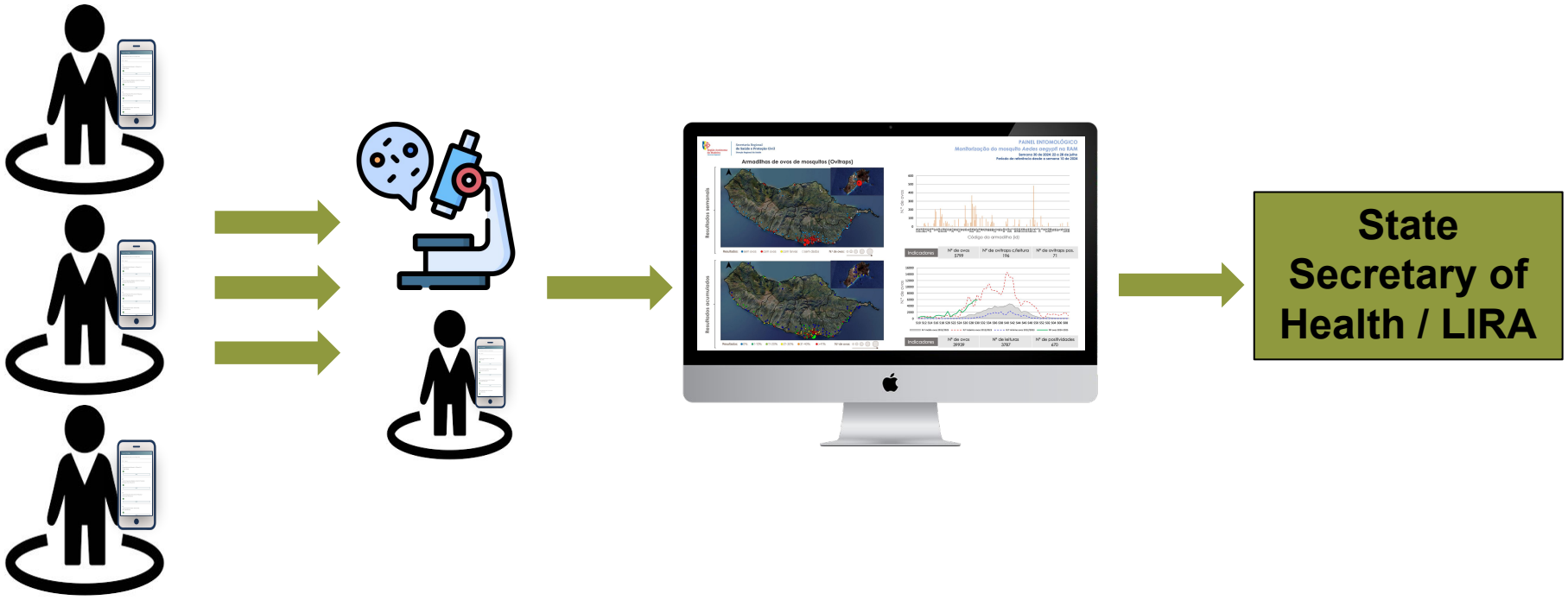
- **Gamified mobile APP** for mosquito surveillance in Northeast Brazil (Madeira coming soon ☺)
- **Early warning model** using heterogeneous big data, Internet of Things (IoT) to predict mosquito population dynamics for better control of Zika virus

# Joint MEWAR & Madeira & Brazil meeting in London

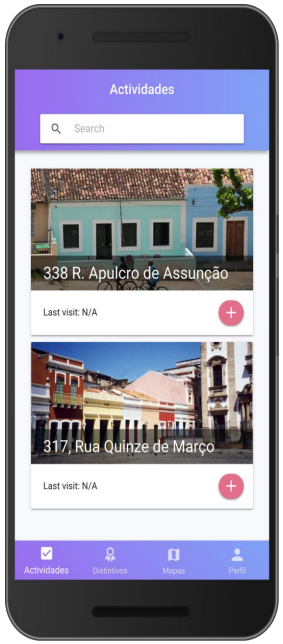
# MEWAR Project

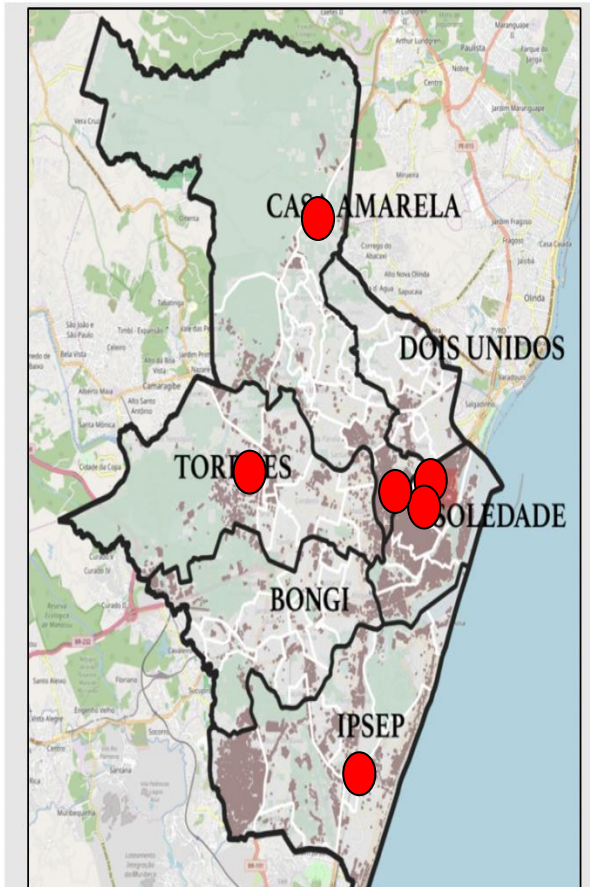
## App & Platform - Future Vision

### Automated mobile data collection for health agents and managers



# ZIKA app for mosquito surveillance for health agents




Mosquito Alert in Brazil - video

# Internet of Things (IoT) Prediction of High-risk Mosquito Infestation

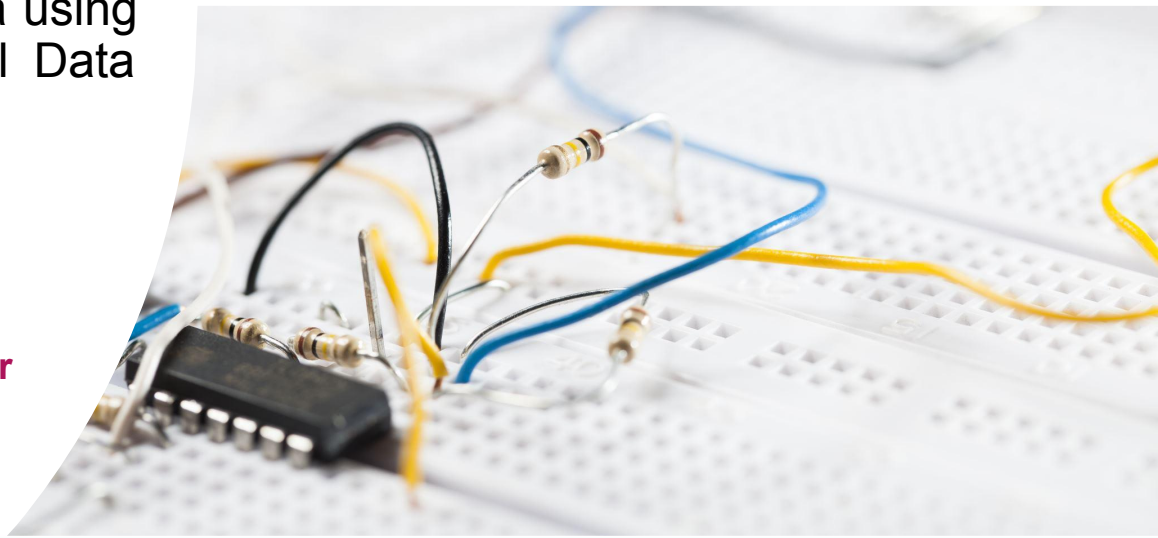
- In addition to Surveillance Data using Mobile App - > Environmental Data using IoT Sensor Devices

**Meteorological Data**

- Air Temperature, Humidity and Pressure

**Physicochemical Parameters of Water**

- PH, dissolved Oxygen and Temperature



# PEARL mobile and IoT surveillance challenges

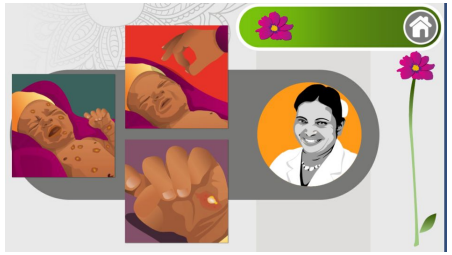
## Political and Administrative

- Lack of harmonisation of processes
- Changes in political priorities and administrative obstacles to access data
- Challenges with using mobile phones and IoT in real settings
- Limited policy making informed by RT data

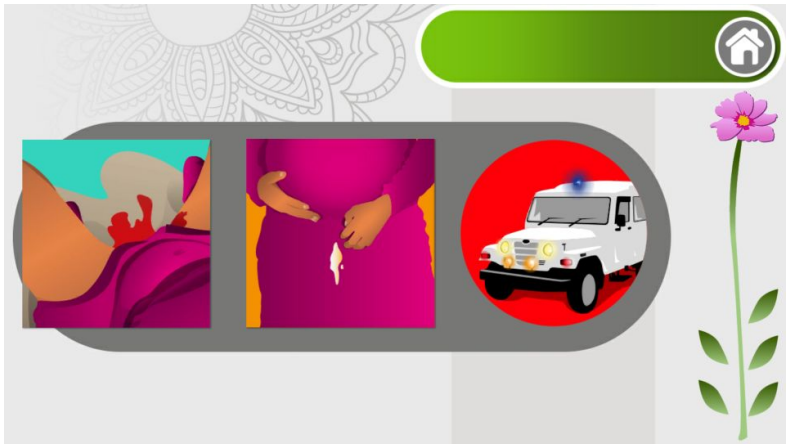
# Theme 3: Serious Games For MANTRA: Maternal and Newborn Technology for increasing maternal and child health in Nepal

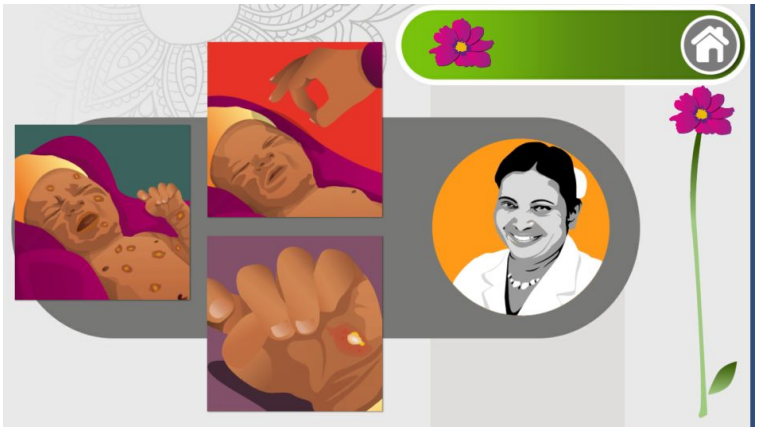

# MANTRA game development and results

- Educational content – learning through gaming
- Engagement and Immersion
- Pictograms, no text to cater for illiterate audience, with no experience with smartphones
- Statistically significant knowledge gain and qualitative feedback:
- ***Facilitator:*** *What made you feel like playing?*
- ***Woman:*** *The thing that [we] need to understand about health. The thing that is necessary for mother to understand about child, if [we] understand that, it will be useful for all. Therefore, the more we play that "game", the more it will be beneficial.*



# MANTRA game development and results





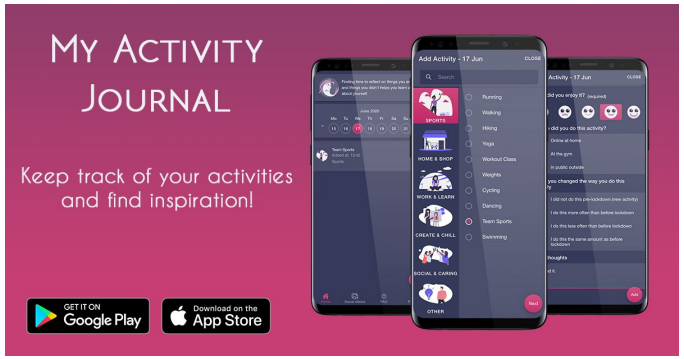
# PEARL digital intervention challenges in LMIC

## Ethical

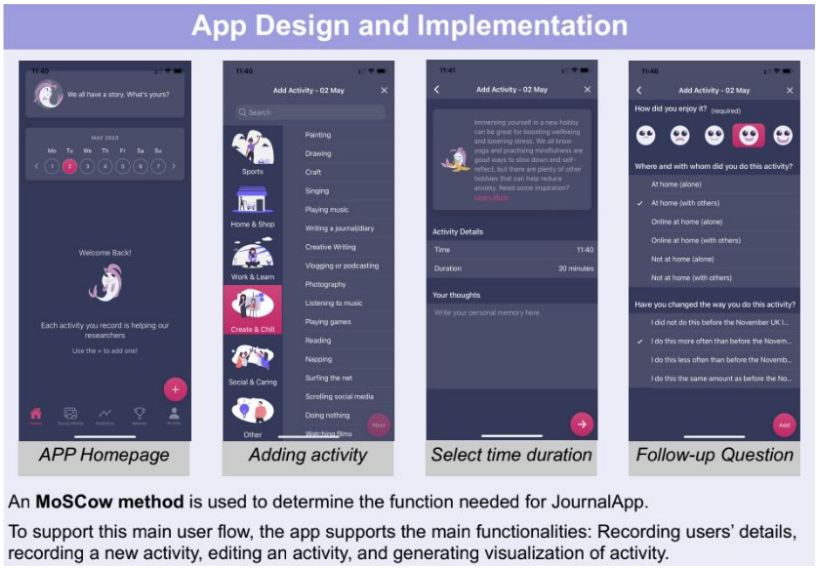
- Access to mobile phones and data limited in Global South
- Digital divide and equity
- Gender digital access inequality

# Theme 4: COVID-19
# My Lockdown / Activity Journal APP:

- helping people adapt to lockdown since April 2020, **1100+ users**
- **Zoom or Not to Zoom: online survey** to understand lifestyle change during lockdowns since March 2020, **8000+ participants**
- **Social Media Instagram competition –** weekly winners
- Initial Results: During the 1st lockdown: majority of citizens did sports at least once a day and reported practising yoga, prayer or meditation

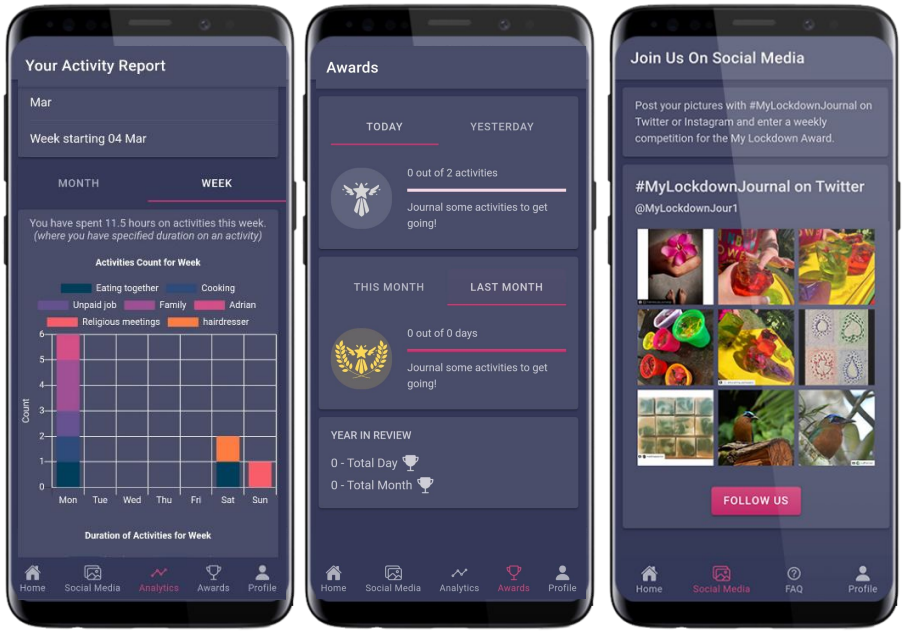
# App design




- Rapid development using components of previous dPHE work
- Android app only
- 1422 Users registered
- 11900 Activities reported
- Popular social media campaign


# Activity tracker, badges and social media

1. Self-analytics (gamification via self-evaluation)
2. Badges (gamification via awards)
3. Social Media Challenges (gamification via community)



# PEARL digital intervention opportunities

## Societal

- Opportunities to engage public through a well designed digital intervention while
- Seamlessly collect data about behaviour
- Enable behaviour change