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Methodology Improvisation

Innovations in Community Diagnosis: Integrating Technology for Enhanced Learning

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A B S T R A C T

Introduction

Community Diagnosis (CD) is vital to medical education, offering practical insights into community health. Conducted by the Department of Community Medicine, this four-week immersion in the field equips MBBS students with essential skills in understanding disease determinants and distribution through practical activities. One such activity is village mapping, which deepens their connection with the community. I am sharing a recent innovation that has transformed this CD activity, enhancing student learning using mobile apps and geographic information systems (GIS). This innovation empowers students to explore and understand communities more deeply.

Traditional Approach: Village Mapping and Chart Presentation

Conventionally, in the village mapping exercise, MBBS students were grouped and sent into the community for hands-on experience. They meticulously note details about streets, types of houses (pucca, kutcha, semi-pucca), and areas of public health significance. This data was then translated into village maps presented on large charts (Fig 1) for classroom teaching, supported by faculty feedback. However, these charts had notable limitations. Teaching them to larger audiences was challenging, and deciphering details from hand-drawn maps posed difficulties. Moreover, effectively communicating the significance of the content to students took a lot of work. As a result, these charts saw limited use within the department, and sharing them outside was impossible, given the vulnerability of paper charts to damage.

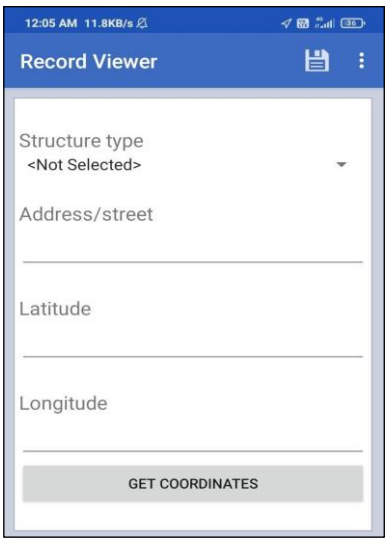
Incorporating Technology: Epi Info App and GIS Mapping

We introduced an innovation in the village mapping exercise by integrating the 'Epi-Info 7' [1] mobile app for data collection. Our approach starts with creating a data collection form using the app, recording attributes like structure names, housing types, healthcare facilities and Latitude and Longitude. Students visited the village in groups and collected data house by house through the app (Fig 2 a-c). The Geographic Information Systems (GIS) coordinates of a location are captured using an inbuilt option in the app. Once the data is gathered for the entire village, it is compiled by student representatives who had volunteered and exported into a '.csv' format. Back in the classroom,

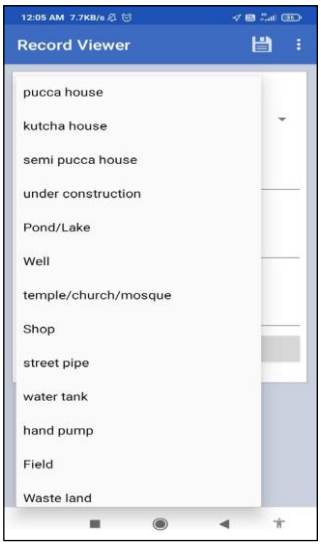
the real magic happens. The data is imported into 'Google My Maps' [2] to create a digital map and displayed on a projector screen by the faculty (Fig.2 e). The interactive maps allow us to select attributes, for example, "Pucca house", pinpoint locations, identify clusters, and discuss their relevance to health determinants with students. This interactive method promotes pattern recognition and encourages student commentary. These maps offer a comprehensive view of village layout, socio-economic clustering, and public health infrastructure distribution, thus gaining insights into community health determinants. The map we have created is available at https://www.google.com/maps/d edit?mid=1wao2rwJHNeuoyWcUAiCvUMxANs5BUWo&ll=10.83 588484778501%2C79.8387251812734&z=18. The innovations continue beyond there. To make this newfound knowledge accessible, a QR code is generated for the electronic map using an online QR code generator[3] (Free version). It is affixed to the chart displayed in the department (Fig 2 d). Anyone visiting the department can scan this QR code using their smartphone, instantly accessing the electronic map.

Figure 1.Map of a village created by the students and displayed as a chart. Legends are shown in the Top right corner of the chart

(a) Epi Info App (Mobile)

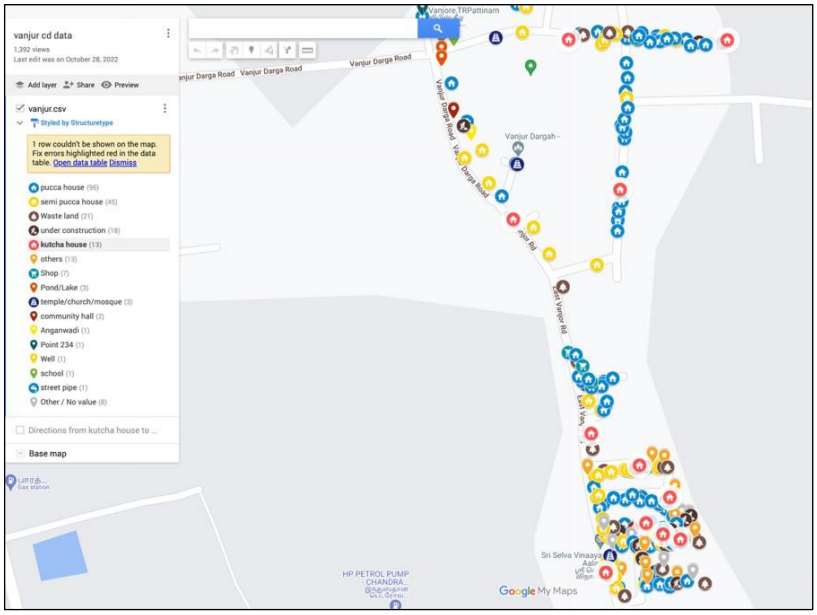


(b) Data collection form in the app



(c) Attributes of a structure collected at each location

(d) Chart showing a Map of the Village drawn by the students. Legends are on the Top left, and the QR code is pasted at the bottom Right.



(e) Dynamic Map of the village created using Google Maps using the coordinates collected through EpiInfo. The density of houses and the Clustering of semi-pucca houses (yellow) in the southern part of the village can be appreciated

Figure 2.Process of data collection using an app and creating a digital map

Students Feedback

Students have given positive feedback about introducing technology-enhanced learning in our CD activity. They like using the Epi Info app because it helps reduce errors, makes data collection interesting, and makes compilation easier. This new approach to GIS mapping has made electronic maps easily accessible and allowed students to explore communities more effectively. QR codes have been well-received for their accessibility and for extending knowledge sharing beyond the classroom. Most importantly, this technology bridges the gap between the physical and digital realms.

Conclusion

We have simplified data collection and presentation by incorporating mobile apps and GIS mapping, enhancing students' understanding of community health. With electronic maps accessible via QR codes, the knowledge generated during CD Posting extends beyond the classroom and becomes a shared resource. This technological advancement emphasises the ever-changing nature of healthcare education, ensuring students are well-equipped for the continually evolving healthcare environment.

References

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