

EpiCollect: A Web-based Mobile Data Collection Tool for Veterinary Epidemiology - *Md. Aminul Islam, DVM, MS-TAH*

Surveillance of health events is one of the major deals of veterinary epidemiology, holistic approach in particular. Epidemiosurveillance concerned with the systematic and continuous monitoring of association between the health events and their exposures in animal populations. The epidemiosurveillance network comprises of four stages: data collection, data transmission, data processing and dissemination of information. Accurate collection of information from field and prompt transportation to the lab is the one particularly for emerging zoonoses. Timely collected field data enable the epidemiologist on gaining an understanding of the mechanism and transmission dynamics of disease, and thereby modeling to predict the future spread of a disease and to design various control options. In such a settings like Bangladesh, collection of quality data from field and transportation to the lab takes a long time with traditional paper written questionnaire based collection and by-post transportation system even in an organized surveillance programme. In addition, so far most of the veterinary epidemiological surveys cover the road side sampling due to ease of communication and so on though animal populations are concentrated over the remote villages. A web-based mobile data collection tool could obviously be of help in improving such a situation. It not only can minimize the time-lag of data from field to desk but also ensure the quality of data even from remote access areas by reducing sampling biases. To this way, researchers and policymakers are always able to access up-to-date predictions on disease emergence.

Many forms software tools exist within the epidemiology and public health community (e.g. EpiSurveyor, EpiInfo, EpiCollect, Outbreak Management System etc.) those provide detailed feature to design data collection forms and data sharing. In particular EpiSurveyor is designed as a web-based mobile system; its mobile client is developed for J2ME phones and has a commercial software license. On the other hand EpiCollect is open source, free public license and it therefore could be a economic choice for active surveillance of animal diseases.

What is EpiCollect?

The EpiCollect is a free open source software application for collecting, storing, and exporting real-time data from remote rural areas across the globe for epidemiosurveillance of human/livestock/wildlife diseases as well as resource mapping. It was developed at Infectious Disease Epidemiology Department, Imperial College of London, UK with a grant of Wellcome trust (Aanensen et al., 2009).

EpiCollect software package consists of two parts:

- i. A mobile application: Mobile handset that currently runs Android and/ or iPhone operating systems can be used for running EpiCollect software. However, a number of mobile handset recommended by the EpiCollect developer such as Android (T-mobile G1, Developer G1, HTC plus, HTC desire, HTC legend, HTC Evo 4G, HTC Wildfire, Google Nexus One, Samsung Galaxy, Sony Ericsson Xperia X10, Motorola Milestone etc.) and iPhone (iPhone3, iPhone 3GS, iPhone4 etc.).
- ii. A web application: EpiCollect server provides a web application for the generation of forms and freely hosted project websites (using Google's AppEngine) for mobile data collection projects.

How to start with EpiCollect?

There are four steps (Fig.1) to be followed to complete whole process

- i. The first thing is you have to create your own project website with an identical name through the link (<http://www.epicollect.net/create1.html>) that is free hosting on EpiCollect server.
- ii. Once after creating your own project, you can login using Google mail account on a desktop/laptop

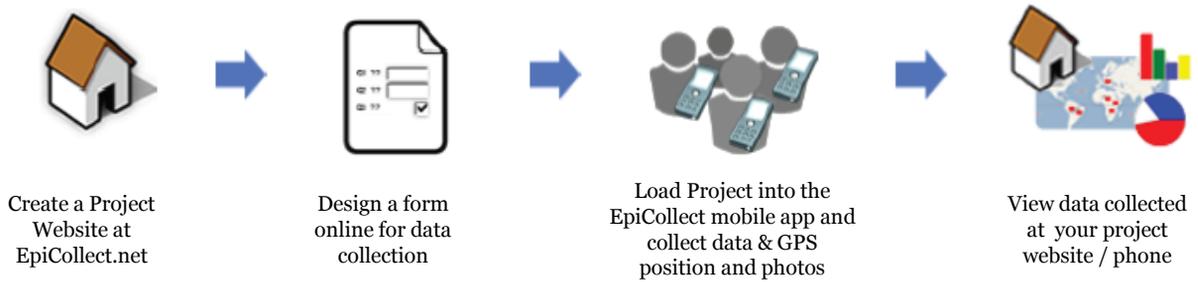


Figure. (1) Overview of the EpiCollect workflow (photo source: <http://www.epicollect.net/>)

computer with internet connection. You can design a form/questionnaire for data collection as per research interest. EpiCollect entries usually include the GPS location and a photo, however in order to collect text data (e.g. short text, long text, multiple choice questions, radio selects, checkbox selects and numeric etc.), you should specified them in the form designed.

iii. Downloading and installing of EpiCollect software onto the mobile handset then the project(s) should be loaded onto the handset. To download EpiCollect, visit App Store (for iPhone) or Android Market (for Android phone) on the handset and search for EpiCollect. To load a project onto handset, it needs to be connected to either a mobile data network (e.g. 3G) or to a wireless network but once after loading not necessarily to be connected during data entry at the field. When EpiCollect is launched on the mobile phone three options are initially available, 'New Entry', 'List Entries' and 'Display Map'. By selecting 'New Entry' you can creates a new data record within the phone's on-board database and assigns a unique ID to the record. The latitude, longitude and altitude of the current position of the user are returned from the GPS unit of the phone. After that three more new options are available, 'Photo', 'Data' and 'Store'. Selecting photo allows capturing an image, 'Data' displays the data entry screen, 'Store' saves the current record to the phone's database along with the date and time that the record was created. Subsequently, this process is repeated to create further records. The 'List entries' option allows all records stored within the phone's database to be viewed and amended if necessary. The 'Display Map' option allows all records stored locally on the phone to be displayed on a map using the in-built Google Maps application (Aanensen et al., 2009).

iv. After successful entry of necessary data, one can amend the look and feel of his/her homepage by adding some explanatory text about your project and upload an image through login the project website. The data collected can be viewed as plain text (table containing all records) or viewed using the mapping interface, which includes a number of options for exploring data synchronized (a copy sent from the phones). The standard click-drag-zoom interface to the map is available on the phone allowing map navigation and can, using the GPS, instantly zoom to the phone's current location. However, the public view allows only the downloading of data and the ability to view and filter the data using the mapping interface.

Advantages of EpiCollect

- ❖ The application allows users to collect geo-tagged data (location of sampling point with coordinates), photographs and other text data as per necessary by the users
- ❖ It can be easily customized without high-level programming knowledge
- ❖ It is possible to monitor, collation and immediate presentation of results from multiple handsets in the project website
- ❖ It is possible to load more than projects and data entry for corresponding project in each mobile handset
- ❖ It helps in collecting real-time data from remote rural areas across the globe that is generic enough to be applied to a wide variety of field scenarios
- ❖ Applications can be updated while the phones are in use in the field
- ❖ Data can be backed up
- ❖ Simple XML description of project forms and for definition of server locations

Limitations of EpiCollect

- ❖ High cost smart phones are mandatory for running the software
- ❖ Only support available is through emailing the project sponsors with questions and/or problems in term of functional trouble shooting, no other outer support system

Conclusion

EpiCollect presents the intriguing opportunity for epidemiology and public health workers with the ability to rapidly create share and collect data using a diverse mobile platform. It allows the field veterinarians to upload their findings to a central website which plots where diseases are occurring. It helps to build up a strong national database on animal disease events covering the remote access areas of the country. The phones have also been loaded with a range of educational resources, including photos and videos for veterinary fieldworkers.

References

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