Establishment of State Epidemic Intelligence Unit: From Thought to Action

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Epidemic Intelligence Unit (EIU): the birth of a thought

Public Health Emergencies of International Concern (PHEIC) have always been a threat to the health care system regardless of level (country, state or district).[1,2] The year 2020 will always be remembered for one of the biggest pandemics in the history of mankind. Gujarat, like other states of India, was challenged by the COVID-19 pandemic. In the Department of Community Medicine, Government Medical College, Surat, Gujarat, we were forecasting the course of COVID-19 wave in Surat city and Surat District using modeling techniques. It was during this activity that we became acutely aware that there was an unmet need of big data collection and analysis, especially at State level. It was as if we knew the recipe but had no ingredients. The data demand was high, but there was no initiative in systematic data collection and management. As Community Medicine personnel, we were concerned about the quality of data and real time availability. We envisaged regular data flow that could help us derive trends, link cases and project to future. The State Ministry of Health and Family Welfare identified PSM departments of the medical colleges of the State to establish an Epidemic Intelligence Unit (EIU) and invited us to take the lead. As the Nodal Officer of EIU, we were able to prepare a roadmap of our vision. The Epidemic Intelligence Unit was seen as a frontline unit for rapid risk assessment and response to COVID (or any other acute PHEICs).[3] The expected outcomes of setting up EIU, during COVID-19 pandemic were:

1. Giving a lead time, through early warning system before exponential growth of cases/ outbreak.
2. Detection of changes in clinical presentation
3. Detection of changes in vulnerability of people and identifying at risk population.
4. Estimating impact of outbreak
5. Detection of changes in infection transmission dynamics.
6. Expanding Epidemic Intelligence to other infectious diseases.

Right from the beginning, it was evident that data collection and analysis of this magnitude will not be a simple task. Hence we decided to list down our prerequisites.

EIU : Gathering the tools

We proposed a three-tier system, composed of State, Regional and District Epidemic Intelligence Unit. Each level integrated the existing reporting systems with the Departments of Community Medicine in medical colleges across the state.

An Early Warning System needed collection of meaningful indicators, such as Case line list, contact tracing and testing data from each district. Hospital and community level data had to be collected. Apart from demographic details, we also focused on

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symptomatology, gaps in symptom onset, detection, and link to care. Of particular interest was COVID-19 infection among children, travelers, and vaccinated population. We established a Google sheet-based database, where the reporting Districts/ Corporations could share the data on a weekly basis. This data, was cleaned, analyzed, and interpreted at the Department of Community Medicine Government Medical College Surat. Data flow in EIU is given in Figure -1.

EIU : The impact

The systematic data collection, analysis and interpretation through EIU helped in identifying emerging hot spots, contain the spread of infection by timely forming containment zones and inform active and passive surveillance activities.[4,5]

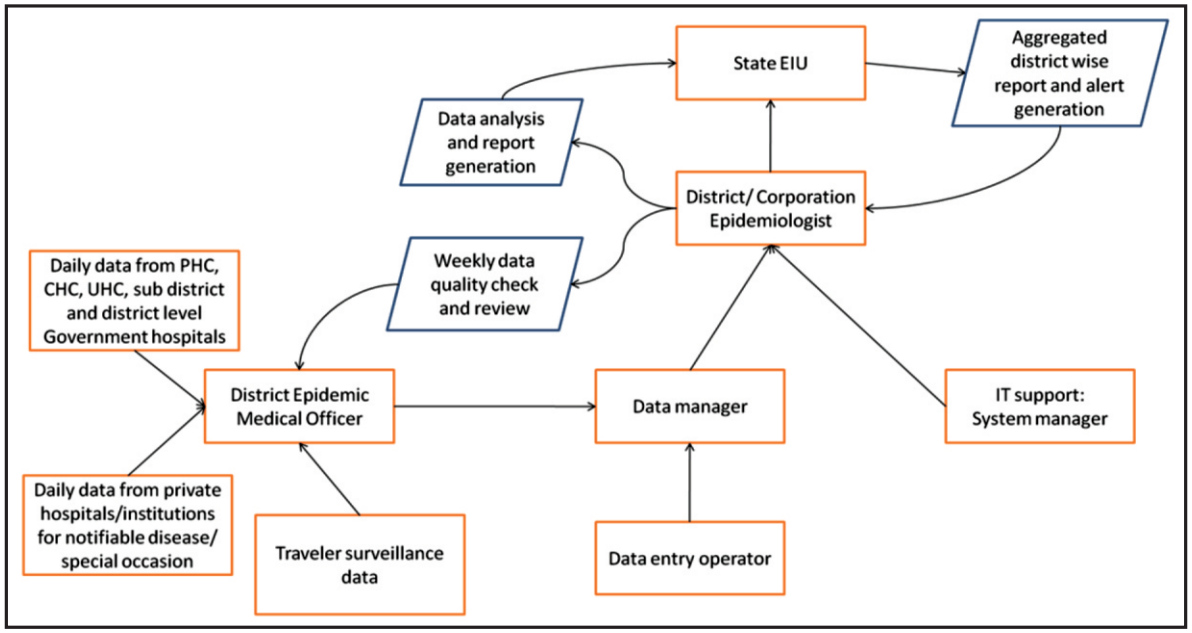
Every week, we were able to comment on the sociodemographic profile, clinical presentation, change in trends, vulnerability of sub groups and gaps in detection and care. Thus, the EIU could make several important observations from time to time, such as stabilization of second wave, beginning of third wave and track high inflow of COVID-19 cases from neighboring states. We were able to identify districts at risk and suggest feasible, appropriate and optimal control measures. We were able to identify missed case links and highlight insufficient contact tracing in some districts.

EIU : The challenges and future

The scope of EIU can be expanded even further, to allow us to comment on short and long term impact of COVID-19. In order to detect changes in clinical presentation and changes in risk factors or vulnerability of people, uniform case reporting and data collection is mandatory. Major challenges of EIU were:

- Incomplete and non uniform patient hospital records: It was observed that data was missing in hospital records, which in turn resulted in difficulties in data collection and incomplete information. We propose that an Uniform case reporting format for notifiable infectious diseases, designed by EIU and approved by Ministry of Health and Family Welfare, Government of Gujarat (MoHFW, GoG), must be used by medical practitioners across the state. Existing system of case paper/ case record must be replaced by Uniform Case reporting format, to minimize duplication of work and ensure uniformity and completeness of patient record.

Figure 1 : Data Flow in EIU



Additionally, Uniform reference ID system for lab investigations and radiology report should be generated. Family/ Contact ID must be generated when families or contacts are tested. This alpha numeric ID with QR code must be traceable to the date, lab/ radiologist and batch of test process and linked to Uniform Case reporting format.

- Data entry and cleaning: We observed that despite the efforts at all levels, errors could creep in to the reported data. This required repeated rounds of data cleaning and supportive supervision. Given the utility and ability of EIU to generate useful data, we proposed that there should be a State level IT platform to ease data compilation.

It was our vehement refusal to depend on secondary data and unshaken demand for real time data that paved way to establishment of EIU. State Epidemic Intelligence Unit of Gujarat can be seen as a prototype of the big data analysis techniques those are bound to become the part and parcel of tomorrow's healthcare.

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