Leveraging Underused Community Assets to Establish a Mosquito Larvae Monitoring System: Report of a Two Year Project

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Presenter Disclosures: Sandy Hoar
The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months: No relationships to disclose

Objective: Develop a community-based early warning system for dengue fever in rural eastern Mexico

Setting:

Population 584

Occupations—farming, animal husbandry, merchants

Agriculture—corn, sorghum, beans, sugarcane, vegetables, citrus, nuts

Sanitation—1/2 households with indoor plumbing

Background

- Recent reports of dengue fever in a rural region of Mexico (Villa Mainero, Tamaulipas)
- No official government presence for monitoring & surveillance or health education in this community.
- Long-standing, twice a year surgery campaigns with concurrent primary care, public health, & school health programs.

Background-Dengue Fever

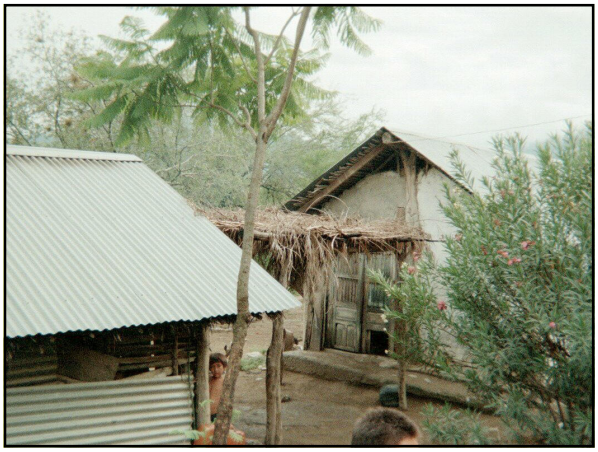
- Dengue fever is a mosquito-borne viral disease.
- It is debilitating, painful, & sometimes fatal.
- No vaccine prevention nor specific treatment-just supportive.
- Mosquitoes require a small amount of water for 3-5 days as part of their life cycle.
- Two decades ago mosquitoes were rarely seen in this region.

METHODS

The entire school & PTA learned the life cycle of mosquitoes, usual locations of standing water, & methods to prevent it.

Year 1:

- 5th & 6th graders participated in a regional needs assessment, identifying trash & dengue fever as problems.
- They studied beginning disease epidemiology, the risk of disease in a population & the value of monitoring & surveillance.



Year 1

- Students were divided into 6 teams, given a parcel of land near school where they identified standing water & searched for larvae.
- 2 teams tried to prevent the standing water, the other 4 monitored the conditions on their plot.

Year 2

- Students were divided into 4 teams, given a quadrant of the town where they searched for standing water, took photographs & GPS readings, searched for mosquito larvae, & explained to landowners the prevention of standing water & the dangers of mosquito growth.

Trash Campaign

Standing Water

Results

Year 1:

- Students in a focus group identified both trash and dengue as current regional problems, drew & measured a plot of land.
- Standing water was identified, especially in trash, & insects, though not mosquito larvae, were found.

Year 2: the students identified multiple sites with trash, standing water, & mosquito larvae.

The student data was given to local & regional officials & prevention efforts initiated before the first case of dengue in the town.

Open Drinking Water

Outcomes of Model

- Quality of data was decent
- 28 sites with GPS & mosquito/ trash/ water observations
- Children as effective as adults at basic GPS & public health data collection
- Children able to advocate & bypass the usual political protocols

Conclusions

Students are an untapped resource with boundless energy for field work, a fascination with science, & a desire to help in their community.

They are aware of the local problems & often can devise solutions.

They can incorporate the lessons learned into their daily activities, i.e. preventing standing water, picking up trash, proper handwashing, or the need for vaccinations.

Conclusions

They soon will be the adults who will have to decide which programs to implement.

The students understood why trash promotes standing water, delighted in educating the town adults, & took all the photographs & GPS readings during non-school hours.

The students' data galvanized politicians to institute prevention efforts before the first case of dengue in the town.

Conclusions

Developing countries have few resources for monitoring for & surveilllance of mosquito-borne disease, indicators of disease, & the effectiveness of programs.

ɔmmunities trying to establish monitoring of public health indicators should consider working with students of all ages to help expand their programs.