One Border, One Health:

A Novel Binational Approach to an Early Warning Infectious Disease Surveillance System

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The Backdrop

Unique Health Challenges for Border Communities

- More Dynamic growth
- Higher poverty
- Lower Educational Attainment
- Lower Access to Health Care
- Lower ration of Health Professionals
- Higher incidence of infectious disease
One Border One Health

Regional Network
• California- Baja California Border
• Bi-national Collaborative
• Cross border problems at the Human-Animal Environmental Interface
• Public Private Partnership
• One Health Approach

One Name - Two Challenges
• One Border
• One Health
A Biodiversity Hot spot

Legal/ Illegal importation of Animals

Squatter communities lacking clean water & sanitation

Large Agricultural livestock industries

Urban & Rural Poverty

Desert Communities

Images from Google.com
One Border One Health

A California – Baja California Regional Network

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Mission Statement
One Border One Health is a bi-national multidisciplinary cooperative building more resilient and healthy border communities by identifying, responding and creating sustainable solutions to health risks at the human-animal-environment interface.

3 Focus Areas

• **Surveillance** – Enhance surveillance for emerging and re-emerging pathogens using a One Health approach
• **Education and Outreach** – Raise professional and community awareness and integrate a One Health curriculum in education
• **Informatics** – Supporting information exchange and providing mechanisms & models for data collection and exchange among partners
Focus Area 1: Surveillance

Recognized need for sustainable early warning system for emerging pathogens
Workgroup identified 2 priority projects:

- **Pathogen Prioritization Project**: to identify infectious diseases for use in a model one health cross border integrated system-
  - researching existing models used in pathogen prioritization
  - identifying and adopting a tool to use in CA/Baja CA
  - Using Subject Matter Experts to review a potential pathogen list

- **Demonstration / Proof of Concept project**: used to validate the approach to external stakeholders-
  - Influenza – bi-national integrated surveillance program
  - identify viruses circulating in humans, domestic poultry, swine, wild bird in the border region
Focus Area 2: Education & Outreach

Three prioritized target populations identified:

- **Academia** – One Health course development (undergraduate, graduate, CE)
  - alumni / student newsletters,
  - publishing in scientific & popular journals,
  - development of bi-national & inter professional faculty & student projects

- **Regional Health Professionals** – Clinic informational brochures,
  - clinic presentations from One Border One Health staff, CE

- **General Public** – Engaging community partners
  - Community health educators *(promotoras)*
  - Volunteers & church groups
  - Multiple platforms:
    - Newspapers, brochures, Social Media
    - Facebook, Twitter, marketing of the One Border One Health Website
Focus Area 3: Informatics

**Initial focus** was on enhancing communication capabilities among One Border One Health partners
Web based secure platform – Zoho Projects – calendars, email, messaging, document posting & editing

**Major Focus** – Creating a bioinformatics collaborative system for administering and doing research on multisectoral relational databases.
Databases to be fed & shared by the coalition
Focus Area 3: Informatics

Figure Courtesy of Dr. Rafael Villa-Angulo : Universidad Autonoma de Baja California (UABC)
Focus Area 3: Informatics

Data collection

Sectors:
- Government
- Military
- Public
- Private
- Academic

Kind of data:
- Geographic
- Demographic
- Weather
- Transportation
- Clinical
- Public health

Mining and Modeling

Epidemic models:

\[
\begin{align*}
S(t) &= S(t) - \beta SI(t) \\
I(t) &= I(t) + \beta SI(t) - \gamma I(t) \\
R(t) &= R(t) + \gamma I(t)
\end{align*}
\]

Projecting pathogen threat

Complex Networks:
- Regular Network
- Random Network
- Watts and Strogatz Network

Figure Courtesy of Dr. Rafael Villa-Angulo: Universidad Autonoma de Baja California (UABC)
Challenges

- Over 90 Institutions
- Language
- Knowledge
- Sectoral differences across borders
- Sustaining engagement between meetings.
- Funding for multidisciplinary cross sectoral initiatives
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Questions?

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