Using evidence on violence and injury prevention for policy development and decision making in Ciudad Juarez, Mexico

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ABSTRACT
This report describes the implementation process and functional structure of the Observatory of Security and Citizen Conviviality of the Juarez Municipality (Observatorio de Seguridad y Convivencia Ciudadanas del Municipio de Juárez) in Chihuahua, Mexico, and discusses the most relevant lessons learned and main challenges in the near future. The Observatory, created in 2008, is a joint effort of the Juarez Municipal Government, Autonomous University of Ciudad Juarez (Universidad Autónoma de Ciudad Juárez), and the Pan American Health Organization. The Observatory’s main objective is to propose strategies and public policy recommendations to prevent and control violence and injuries in the Juarez Municipality. Most key federal, state, and local agencies have joined this independent autonomous citizen-based initiative, feed the databases, and benefit from the information produced by a multisectoral, multidisciplinary approach. The Observatory contributes far more than the technical data provided and its facilitating functions. The clear results obtained in such a short time—as seen in the preliminary results of the case study on road injuries from January 2009 to July 2011—demonstrate the appropriateness of this course of action and should stimulate the creation of new observatories whenever and wherever needed. Lessons learned, as discussed here, can open the way to new endeavors, and current challenges show how much work remains to be done.

Key words
Epidemiologic surveillance; violence; accidents, traffic; geographic information systems; border health; Mexico; United States.

Ciudad Juarez, at the United States–Mexico border, the most populated of all municipalities in Chihuahua State, is 1 of the 10 largest cities in Mexico, with 1 332 131 inhabitants (1). Violence in the area increased significantly from 2007 to 2010 (2). During that period, the homicide rate increased from 23 to 224 per 100 000 inhabitants, and in 2011 there were still a very large number of deaths due to external causes [data from the Observatory of Security and Citizen Conviviality of the Juarez Municipality (Observatorio de Seguridad y Convivencia Ciudadanas del Municipio de Juarez) in Chihuahua, Mexico]. This situation triggered the concerns and actions of local, state, and national authorities as well as involvement of civil society.

In spite of reports on homicides, violence, death, and injury due to external causes, scattered and faulty information made it impossible to fully understand the magnitude and characteristics of the different types of violence, its roots, and the mortality burden. Furthermore, critical data on violence from different sources were not shared and information was missing, thus hindering a comprehensive analysis of violence and injuries. These factors limited the timely compilation of evidence for policy and
decision makers to implement appropriate programs. The lack of multisector, comprehensive, and timely information made it practically impossible to improve conditions in the community and for the city to prevent events leading to acts of violence such as partner violence, violence against women, gang violence, child sexual abuse, and road injuries.

A historic meeting of civil society organizations with the public and private sectors was convened in 2008 by the Autonomous University of Ciudad Juarez (Universidad Autonoma de Ciudad Juarez, UACJ), the municipal government, and the Pan American Health Organization (PAHO) to identify key issues to be addressed in public policies. Approximately 200 representatives of community organizations as well as public and private institutions and experts from PAHO, the National Center for Accident Prevention (Consejo Nacional para la Prevencion de Accidentes, CENAPRA), and the Colombian Institute for Research and Development in Violence Prevention and Promotion of Social Conviviality (Instituto de Investigacion y Desarrollo en Prevencion de Violencia y Promocion de la Convivencia Social, CISALVA) convened to review the available information and propose immediate actions. Injuries from external causes were confirmed as the main problem of this prosperous municipality. It was clear that solving such a complex problem required combined multisector efforts and a credible source of validated and well-elaborated information.

This community consultation resulted in several lines of action, one of which was the creation of an observatory to monitor violence, designed under the recommended guidelines of PAHO and CISALVA (3, 4). Another recommendation was to implement evidence-based programs and policies to prevent violence and injuries in key settings. Several types of violence were identified: domestic violence (in homes and families), bullying (in schools), occupational injuries (in the workplace), and delinquency and other types of violence (in the community).

The known observatory methodologies enable a more interdisciplinary analysis of problems by involving multiple sectors, including health, justice, police, traffic, education, development, housing, parks and recreation, and community leaders and representatives (4).

In this framework, the Observatory of Security and Citizen Conviviality of the Juarez Municipality was created in November 2008 through the joint efforts of the Juarez Municipal Government, the UACJ, and PAHO through its United States–Mexico Border Office. Most key agencies of Juarez Municipality joined this independent autonomous citizen-based initiative.

The setting for the Observatory involved a core investment so that many agencies could work together to improve social conditions in Ciudad Juarez and create effectively proven synergies. The Observatory uses a comprehensive multidisciplinary approach that views violence and injuries as preventable public health problems (5).

The overall goals of the Observatory are to propose strategies to prevent and control violence and injuries and to design public policy recommendations to enhance citizen safety and conviviality in the Juarez Municipality.

These goals are reached through the evidence generated by the Observatory. Therefore, the Observatory had to establish a reliable, flexible, timely, and sustainable information system with the support of authorities from participating institutions and civil groups. For a secure citizenry and a peaceful community, the Observatory should identify trends, provide validated analyses of models and violence typologies, and produce sound indicators of the current situation.

The information and analytical tools produced by this coordinated effort give a clear and comprehensive picture of deaths due to external causes and a detailed map of the hotspots of violence in the municipality. This information system also keeps track of appropriate indicators and monitors the effect of public policies and interventions on the improvement in the health and safety of the entire population.

This report describes the implementation process and functional structure of the Observatory and discusses the most relevant lessons learned and main challenges in the near future.

THE OBSERVATORY: A MULTISECTORAL, MULTIDISCIPLINARY PROJECT

Bringing together many institutions to focus on one rather complex objective (Figure 1) was a challenging task because of the difficulty of building enough trust among the many stakeholders to share data for the Observatory. UACJ is a highly recognized, credible, and respected institution in Ciudad Juarez and the fact that many leaders and authorities were trained there facilitated the decision to place the Observatory on its premises. Support from PAHO and the municipal government was also a critical factor in successfully setting up the Observatory. Other critical elements were the leadership and resources provided by UACJ, PAHO, and Juarez Municipality.

The greatest barriers arose from the specific interests of each participating institution; this problem was settled by reaching a consensus on which information was to be most readily available and which posed the fewest conflicts, which led to considering road injuries as the starting point.

Organization structure and input information

The structure and components of the Observatory are presented in Figure 2. The Steering Committee oversees the strategies and progress of the Observatory, works with the Technical Secretariat to coordinate and ensure implementation of Observatory activities, and monitors execution of the strategic plan (5). The Steering Committee defined the fields of action to cover all cases of violence (particularly those against women, girls, boys, and adolescents), homicides, occupational and road injuries, crimes, and public perception of insecurity in the Juarez Municipality.

The general idea of the Observatory encompasses building a sustainable data input network, with participation of agencies at all government levels (federal, state, and local) in charge of monitoring deaths and injuries due to external causes, both intentional and accidental. Nongovernmental organizations and institutions may also provide information.

The number of variables and records varies in the different Observatory data-
FIGURE 1. Institutions participating in the Observatory of Security and Citizen Conviviality of the Juarez Municipality, Ciudad Juarez, Chihuahua, Mexico, 2008

Juarez Municipal Government
- Coordination of General Administrations
- General Municipal Traffic Division
- General Public Construction Works Administration
- General Public Services Administration
- Institute for Integral Family Development
- Municipal Public Security Secretariat
- Social Communication Secretariat
- Informatics Administration
- Municipal Institute for Research and Planning
- General Ecology and Civil Protection Administration
- General Community Centers Administration

State Government of Chihuahua
- Chihuahua State Secretariat of Health
- Forensic Medicine Service
- Northern Zone Deputy Attorney’s Office
- State Secretariat of Education and Culture
- Coordination of Safe Schools
- State Office of Civil Pensions
- State Center Against Addictions
- Chihuahua Institute of Health
- Women’s Hospital
- State Network of Organizations for the Prevention of Violence

Federal Government
- Federal Secretariat of Health
- National Center for the Prevention of Traffic Accidents
- Ciudad Juarez Local Health Department, Jurisdiction II
- Citizen’s Participation Council of the Attorney General's Office
- Secretariat of Public Education
- Mexican Institute of Social Security
- National Attorney General’s Office
- Federal Labor and Welfare Secretariat

Nongovernmental Institutions
- Ciudad Juarez Autonomous University
- Pan American Health Organization
- Institute for Research and Development in Violence Prevention and Promotion of Social Conviviality, Colombia
- Center for the Prevention and Care of Women in Violent Situations
- Colegio de la Frontera Norte
- Medical Association
- Colegio de Chihuahua
- Red Cross
- Centers for Youth Integration

FIGURE 2. Structure of the Observatory of Security and Citizen Conviviality of the Juarez Municipality, Ciudad Juarez, Chihuahua, Mexico, 2008

Steering Committee
- Mayor of Ciudad Juarez
- Chief of the U.S.–Mexican Border Office of PAHO/WHO
- President of the Autonomous University of Ciudad Juarez

General Coordination

Technical Secretariat
- Technical Secretary
- A representative of the Committee for Analysis and Information Systems
- A representative of the Committee for Proposals and Analysis of Public Policies
- Technical personnel

Committee for Analysis and Information Systems

Committee for Proposals and Evaluation of Public Policies

Workgroups
- Sources of information
- Analysis and presentation of information
- Information systems
- Technical reporting

Workgroups
- Home and family
- School
- Workplace
- Community

Note: PAHO/WHO: Pan American Health Organization/World Health Organization.

Basic elements

Data collection and validation are the start of an extensive and complex process of information management involving the Observatory’s comprehensive information system, made up of five elements constituting a shared technological infrastructure.

The Automated Indicator System (Sistema Automatizado de Indicadores) makes information exchange between participating agencies swift and easy in a controlled, secure environment. It offers predefined reports intended for public viewing (http://datos.observatoriodeJuarez.org:8080/sistemasai/DGTM/reportes.aspx) and dynamic reports for authorized persons to obtain different perspectives of a problem (http://datos.observatoriodeJuarez.org:8080/sistemasai/).

The geographic information system provides charts and maps with georeferenced events to allow municipal agencies to carry out timely actions. For road injuries, for example, the Observatory released public dynamic maps showing the wide range of incidences in 2010 (http://mapas.observatoriodeJuarez.org/transito2010/).

The three remaining basic elements are the website (http://observatoriodeJuarez.org), newsletters (http://observatoriodeJuarez.org/dnn/Boletines.aspx), and a technical information repository (http://www.infofrontera.org).

CASE STUDY: ROAD INJURIES IN CIUDAD JUAREZ

Road injuries, car crashes, and pedestrian injuries are the most frequent and preventable injuries due to external causes in the world (6). In Mexico, road injuries are in first place, causing more than 50% of reported injuries in many urban areas (7, 8). Although violence has an important impact on all spheres of life at the U.S.–Mexico border, more rapid and effective results can be achieved by preventing road injuries. The World Report on Road Traffic Injuries (9) states that road injuries are not randomly distributed along roads; instead, they occur...
at specific locations and intersections depending on road conditions and conditions of drivers and passengers.

Based on trends, geographic distribution of hotspots, and structural and human variables linked to reported road injuries, the Observatory provided a spatial diagnostic of road incidents for 2009 and 2010 in the Juarez municipal area.

Especially important for this task—along with collecting, validating, and processing the input data from different sources—are the joint road audits, in which CENAPRA provides the methodology and certifies personnel as traffic auditors. CENAPRA, in collaboration with UACJ, also offers training courses on a wide range of traffic topics and, together with PAHO, provides specialized equipment. Since the beginning of the collaboration between the Juarez General Municipal Traffic Division and CENAPRA in 2009, these activities have increased considerably and road safety has been technically strengthened. Together with the Observatory and the Juarez General Municipal Traffic Division, many other local authorities participate in the audits to evaluate each incident from different viewpoints, including human and social causes as well as road conditions. These audits are a key tool to study deaths and injuries due to traffic incidents from the security and public health perspectives.

A set of indicators was developed to evaluate general road safety (Table 1). More than 50 variables were used to record data related to the incidents (location, time of occurrence, lighting, and road conditions), motor vehicles involved (category, make, model, registration, insurance, brake, and tire conditions), and persons involved (age, sex, use of safety devices, type of injury). Data have been compiled since January 2008.

The outputs provide crucial information to reduce road injuries and promote road safety. This information is provided in different formats, depending on the variables used. Mapping road incidents makes it possible to identify the most frequent intersections involved (Figure 3). Traffic authorities (with other public service-related sections, urban development, and research institutes) carry out joint audits at these intersections and define the underlying causes and risk factors. These joint audits and their analyses helped local authorities implement informed and effective measures and interventions leading to a reduction in road injuries in the period 2009–2011.

Most measures and interventions implemented were multisectoral and multidisciplinary. In general, interventions have included structural aspects (repairing roads and pedestrian overpasses, constructing and repairing sidewalks), public order (installing traffic signs; posting traffic officers to identify and fine drivers for speeding; enforcing the use of seat belts, car seats, and helmets; spot checking with a breathalyzer to identify persons driving under the influence of alcohol), and educational measures (campaigns for good driving practices) among others. The reduction in road traffic accidents has been visible and sustained (Figure 4).

Although the best results are achieved with the combined effect of these measures and interventions, their separate analyses define important trends and relative weights. Spot checking for persons driving under the influence of alcohol is one of the most effective measures. The analysis revealed that the number of incidents between January 2009 and June 2011 decreased significantly, showing variations that coincided with fluctuations in the anti-alcohol enforcement operation (Figure 5). The observed biannual peaks (May–June and December) have yet to be explained.

Though the decline in the number of road injuries is a multifactor event and it is not clear how much of this reduction can be attributed to the Observatory’s recommendations or specific interventions, these preliminary results may reflect that the information provided by the Observatory and collaborating agencies not only permitted the identification of road injury trends and their causes but also triggered a new type of collaboration that resulted in improved safety and health of the citizens.

### TABLE 1. Indicators created by the Observatory of Security and Citizen Conviviality of the Juarez Municipality, Ciudad Juarez, Chihuahua, Mexico, 2008

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
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<tbody>
<tr>
<td>Road safety</td>
<td>Evolution of road incidents</td>
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<tr>
<td>Rate of road incidents per 100,000 inhabitants</td>
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<tr>
<td>Rate of responsibility in road incidents per 1,000 motor vehicles, according to type of vehicle</td>
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<td>Population density (km²)</td>
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<td>Total road density</td>
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<td>Car ownership rate (motor vehicles per 100,000 inhabitants)</td>
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<tr>
<td>Rate of road incidents per 100,000 inhabitants</td>
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<tr>
<td>Rate of road incidents per 100,000 private motor vehicles</td>
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<tr>
<td>Rate of persons involved in road incidents per 100,000 private motor vehicles</td>
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<tr>
<td>Rate of persons involved in road incidents per 100,000 inhabitants</td>
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<td>Rate of road incidents per 100,000 registered drivers</td>
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<td>Death rate per 100 incidents</td>
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<tr>
<td>Death rate per 100,000 inhabitants</td>
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<td>Rate of injured persons per 100 incidents</td>
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<tr>
<td>Rate of injured persons per 100,000 inhabitants</td>
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<tr>
<td>Domestic violence</td>
<td>Rate of child abuse per 1,000 persons under 18 years of age</td>
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<td>Rate of domestic violence per 100,000 inhabitants</td>
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<td>Rate of sexual violence per 100,000 inhabitants</td>
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<td>Homicide</td>
<td>Rate of homicides per 100,000 inhabitants</td>
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<td>Rate of femicides per 100,000 inhabitants</td>
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<td>Death rate due to firearms per 100,000 inhabitants</td>
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<td>Maps created for each of the eight sectors of the city</td>
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<td>General statistics of traffic incidents</td>
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<td>Frequency of traffic incidents due to crashes</td>
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<tr>
<td>Intersections according to type of involvement in road incidents: responsible and affected</td>
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<td>Intersections according to condition of victims of road incidents: injured and dead</td>
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<tr>
<td>Statistics of intersections</td>
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<tr>
<td>Areas and intersections with a high frequency of road incidents</td>
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<td>Statistics of main thoroughfares</td>
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<td>Main thoroughfares with incidents in 2010</td>
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LESSONS LEARNED AND CHALLENGES

The use of observatories in collecting and analyzing information on relevant epidemiologic issues as well as proposing and monitoring measures to improve population health and safety is well established (4, 5, 10, 11). Violence is a major cause of high morbidity and mortality in many countries, thereby becoming the target of observatories that focus on domestic and gender violence (12–15), armed social violence (10, 16), juvenile violence (17), and crime (18). Regardless of the type and scope of observatories, procedures are similar in that they collect information, validate and analyze data, write reports, and disseminate results. The Observatory follows that procedure.

The number and type of indicators vary among observatories, depending on their scope and the area covered. In any case, every observatory must continuously analyze information and include new indicators when advisable, depending on the situation and context. One of the most complete sets of indicators in our region is that of the Hemispheric Observatory on Citizen Security (19).

The experience of the Juarez Observatory has shown that even in complex situations, academic institutions, international organizations, and diverse governmental and nongovernmental institutions and organizations can combine efforts and collaborate.

Factors contributing to the Observatory’s success can be summarized as follows:

- Combination of the political will of the municipal government and UACJ, the convening power of PAHO’s technical cooperation, and the technical expertise of CISALVA;
- Permanent commitment of the members of the Steering Committee and Technical Secretariat, with joint participation of staff from the PAHO U.S.–Mexico Border Office, UACJ, and the Juarez Municipality and support from other institutions and stakeholders;
- Resources contributed by UACJ, PAHO, and the Juarez Municipality during the implementation phase;
- Acknowledgment of the important contributions of the Observatory and its local, statewide, national, and international benefits;
To enhance the impact of the Observatory, many challenges remain:

- Generation of relevant and critical information on the magnitude of the burden of violence and injuries, thereby creating visibility and awareness at many government levels and in many sectors;
- The high spirit of cooperation of all participating institutions, considering that the Observatory is a common asset; and
- Significant community participation.

To enhance the impact of the Observatory, many challenges remain:

- Continuing technological improvement (software and hardware) in all institutions and increasing technical know-how of staff;
- Including information from new sources to provide a more comprehensive analytical view and increase the scope of the measured events;
- Formulating improved action plans that respond to the needs and requirements of the institutions and community, ensuring the use of the information produced;
- Ensuring the availability of resources to strengthen and guarantee the well functioning of participating institutions and the Observatory;
- Strengthening the infrastructure of all participating institutions, which are the backbone of the Observatory;
- Improving the conceptual framework and operational definitions for better data quality and analyses;
- Expanding and standardizing the set of indicators and working variables;
- Ensuring the participation of all institutions in the analysis and use of information and not only in providing data; and
- Reducing underreported events not conveyed to the authorities.

CONCLUSIONS AND RECOMMENDATIONS

The Observatory of Security and Citizen Conviviality of the Juarez Municipality provides evidence on different types of violence and injuries that affect the population and reveals risk factors and main causes. Its sustained convening power and validated outputs have
shown that it is a proven and qualified voice advocating for the implementation of policies and programs to strengthen conviviality and reduce insecurity in Juarez Municipality.

The Observatory contributes far more than technical data and its facilitating functions. Lessons learned will open the way to new endeavors and current challenges show how much work is still needed. But the clear results obtained in such a short time demonstrate the appropriateness of this course of action and should stimulate the creation of new observatories whenever and wherever needed.

A crucial condition for the Observatory is the sense of ownership of all participating institutions; although UACJ provided the building block for future sustainability, these institutions must be motivated through ownership and participate fully.

Resources are essential for sustainability, as the Municipal Institute for Research and Planning is strongly dependent on municipal budgets and all participating institutions are affected by economic restrictions. By strengthening the analytical capacity of the Observatory and enhancing the reach of information to a wider audience, it may gain the needed sustainability.

Although the support and participation of the federal government is important, it should not become a barrier to local capacity building and decision making. Federal government bodies normally want to have the leading voice; a critical lesson in this case was to ensure that local institutions are the driving force at all times. In fact, this may be the strongest recommendation for similar projects.

Acknowledgments. The authors thank all governmental and nongovernmental institutions and organizations participating in this project. Special thanks go to the authorities of the Juarez Municipal Government and its local branches, UACJ, and PAHO for their fundamental work and involvement. We thank Alicia Rodríguez for her assistance in writing this article.

Conflict of interest. Authors LAG, SP, AYJ, and MTC were professionally involved in setting up or working at the Observatory of Security and Citizen Conviviality of the Juarez Municipality.

REFERENCES


En este informe se describen el proceso de ejecución y la estructura funcional del Observatorio de Seguridad y Convivencia Ciudadanas del Municipio de Juárez, Chihuahua, México, y se presentan las enseñanzas extraídas más relevantes y los principales retos en un futuro próximo. El Observatorio, creado en el 2008, es un emprendimiento conjunto del gobierno del municipio de Juárez, la Universidad Autónoma de Ciudad Juárez y la Organización Panamericana de la Salud. El objetivo principal del Observatorio es proponer estrategias y recomendaciones de políticas públicas para prevenir y controlar la violencia y las lesiones en el municipio de Juárez. La mayoría de los organismos clave federales, estatales y locales se han sumado a esta iniciativa autónoma independiente de origen ciudadano, alimentan las bases de datos y se benefician de la información generada por el Observatorio mediante un enfoque multisectorial y multidisciplinario. El Observatorio aporta mucho más que datos técnicos y estrategias facilitadoras. Los claros resultados obtenidos en un tiempo muy breve —como los resultados preliminares del estudio de casos sobre lesiones en el tránsito llevado a cabo entre enero del 2009 y julio del 2011— demuestran lo adecuado de este procedimiento y deben estimular la creación de nuevos observatorios dondequiera y cuandoquiera que se necesiten. Las enseñanzas extraídas analizadas en este informe allanan el camino hacia nuevos cometidos, y los retos actuales ponen de manifiesto que aún resta mucho trabajo por hacer.

Vigilancia epidemiológica; violencia; accidentes de tránsito; sistemas de información geográfica; salud fronteriza; México; Estados Unidos.