CDC Objective #7, Define an Evaluation Plan for the Surveillance System and Monitor Prevention Activities, with location of relevant IHS materials noted in Blue.

Comments from Group:
- This section is key.
- Allow enough time for thorough exploration, examples, and questions.
- Evaluating surveillance system for quality assurance is necessary.
- Advocating for your surveillance system may be important. Giving examples of what it’s useful for.

Session VII. Define an Evaluation Plan for the Surveillance System and Monitor Prevention Activities

1. Know the steps for evaluating an injury surveillance system:
   1.1 Engage stakeholders in the evaluation;
      Formative Evaluation.ppt. Slides 9-11 (Identify and include stakeholders).
   1.2 Describe the surveillance system to be evaluated;
   1.3 Focus the evaluation design;
   1.4 Gather credible evidence about the surveillance system’s performance.
   1.5 Justify and state conclusions and make recommendations.
   1.6 Use evaluation findings and share lessons learned.
      IP Intervention Theory Presentation.ppt. Slide #8 (Lessons learned about what does not work).

2. Review public health indicators proposed to monitor injuries
   2.1 Basic indicators
      Level 2 Data Analysis.ppt. Slides 10, 20. (Injury rates as indicators of risk).
   2.2 Developmental indicators
   2.3 Research indicators.

3. Use injury surveillance data to monitor prevention activities.
   Billings Injuries as a PH Problem (2).ppt. Slides 23, 36 (evaluation of prevention measures), Slide 24 (use of pilot program).
INJURY SURVEILLANCE TRAINING MANUAL

PARTICIPANT GUIDE

SESSION VII

DEFINE AN EVALUATION PLAN FOR THE SURVEILLANCE SYSTEM AND MONITOR PREVENTION ACTIVITIES

Developed with the support of the
National Center for Injury Prevention and Control
Division of International Health, Epidemiology Program Office
Centers for Disease Control and Prevention
Atlanta, GA
SESSION VII
DEFINE AN EVALUATION PLAN FOR THE SURVEILLANCE SYSTEM AND MONITOR PREVENTION ACTIVITIES

Learning Objectives

- Know the steps to evaluating an injury surveillance system.
- Review public health indicators proposed for monitoring injuries.
- Use surveillance data to monitor prevention activities.

Introduction

Evaluation has been defined as systematic investigation of the merit, worth, or significance of an object. It is an essential organizational practice in public health; however, it is not practiced consistently across program areas, nor is it sufficiently well-integrated into the day-to-day management of most programs.

The highest-priority public health events should be monitored closely, and surveillance systems should meet their objectives as efficiently as possible. The overall purpose of evaluating public health surveillance is to obtain feedback about the operation of the system and to promote the most effective use of health resources. Performance of a surveillance system can be assessed using specific criteria and standards of performance. The evaluation of an operating surveillance system for a high-priority health event aims to increase the system’s utility and efficiency. An evaluation may also compare two or more systems that involve the same health event. But, most importantly, an evaluation will determine whether the system is meeting its objectives, serving a useful public health function, and operating as efficiently as possible.

In 1988, CDC published the Guidelines for Evaluating Surveillance Systems to promote the best use of public health resources through the development of efficient and effective public health surveillance systems. In 2001, updated guidelines were published in the MMWR. The steps proposed in those guidelines are being followed in this session.
1. Know the Steps for Evaluating an Injury Surveillance System

1.1 Engage Stakeholders in the Evaluation

As mentioned in Session III, coalition partners and other stakeholders are the most important users of the injury surveillance results. These users, which includes local government, public health officers, representatives of affected communities, nongovernment offices (NGOs), mass media, and others, should be involved in the evaluation process. They can provide input to ensure that the evaluation of the injury surveillance system addresses appropriate questions and assesses pertinent attributes and that its findings will be seen as useful. They may help to define questions, and this can subsequently increase their ability to use the findings.

Example: In the first six months of the fatal injury surveillance system in Cali, Colombia, an evaluation was performed every month. A meeting with stakeholders and the operation team of the injury surveillance system was held to evaluate how well the system was working. This evaluation addressed the data collection process, the variables and categories, the presentation of the results, and other aspects of the system. During these months, some variables were dropped and others were added.4

1.2. Describe the Surveillance System to be Evaluated

The second step in the evaluation process is to fully describe the surveillance system to be evaluated.

Activities: Describe the public health importance of the injury event under surveillance using measures such as indices of frequency, number, incidence, and mortality rates; years of potential life lost (YPLL); indices of severity; disparities or inequities associated with the health-related event; associated costs; preventability; and public interest (most of these measures were reviewed and calculated in Sessions II and V). Describe the purpose and operation of the system: list its objectives; describe the planned uses of system data; and describe the event under surveillance—including the case definition; describe the context in which the system evaluation is to be done; draw a flow chart of the system; and describe the system components. Also describe the resources used to operate the system, including personnel cost and financial resources.

Example: An evaluation of the injury surveillance system in Central America was conducted in 2004. The flow chart in Figure 1 depicts the evaluation process. Note that the first step was to involve stakeholders in the process.5
When undertaking formative evaluation, your first step should be to identify who you should involve. These are your stakeholders. Stakeholders are those people who have a vested interest in the program and the future use of its evaluation. With input from the stakeholders, you can develop and assess a program that meets the needs of those who will be using it. Your stakeholders should be a diverse group, so think broadly.
You can group stakeholders into four main categories depending on your program.

1. The first group is the implementers - those involved in program operations.
2. The second group is the partners - those who actively support the program.
3. Third is the participants - those served or affected by the program.
4. Decision makers - those in a position to do or decide something about the program.

Ask the class: Who do you think the "stakeholders" in a community-based IP program would be? (may want to jolt response on a flip chart.)

Typical stakeholders include: community leaders; victims, close friends or relatives of victims, health educators (tribal/IHS), fire, police, EMS, agency professional (BIA, IHS, etc), state offices (DOT, NHTSA), other non-profit or voluntary agency personnel (VIC, SafeKids, Safe Communities)

There is a wide range of potential stakeholders - every community/program will be different. The key is to think broadly and try to include people somehow in the planning process.
Who are the stakeholders in a Kids Walk-to-School Program?.

Implementers (Parents, Teachers and staff, Parent/teacher organizations)
Partners (4-H clubs, Boys and Girls Clubs)
Participants (Parents, Children, Neighbors)
Decision makers (Principals and School Boards)
Figure 1. Evaluation Process of the Injury Surveillance System in Emergency Rooms; El Salvador — 2004

1. Involve decision makers in the process
2. Train key persons in the process (operations team)
3. Collect data obtained by the physician in the emergency room
4. Collect data obtained by the epidemiology office in the emergency room
5. At the epidemiology office, review the quality of information
6. At the epidemiology office, complete the data entry
7. Conduct the data analysis and disseminate findings to decision makers and operations team
1.3 Focus the Evaluation Design

The process of the evaluation must be planned to ensure that time and resources are used efficiently. This process involves stating the purpose of the evaluation; identifying stakeholders who will receive the results of the evaluation; stating what questions will be answered by the evaluation and how the results will be used; and defining the standards that will be used to assess the system.

1.4 Gather Credible Evidence about the Surveillance System’s Performance

Indicate if the actions taken because of analysis and interpretation of the data have been useful in controlling the public health problem under surveillance. Each one of the following attributes must be described:

a. **Simplicity**: This refers to both the structure of the system and ease of operation. Surveillance systems should be as simple as possible while still meeting their objectives. A chart depicting the flow of data and the lines of response in a surveillance system can help assess the simplicity or complexity of the system. Simplicity is closely related to timeliness. Simplicity also affects the level of resources required to operate the system.

b. **Flexibility**: A flexible surveillance system can adapt to changing information needs and can accommodate changes in case definitions or technology and variations in funding or reporting sources. Flexibility is probably best evaluated retrospectively by observing how a system has responded to a new demand.

c. **Data Quality**: This reflects the completeness and validity of the data recorded in the public health surveillance system. Examining the percentage of “unknown” or “blank” responses to items is an easy measure of data quality. Data of high quality will have low percentages of such responses.

d. **Acceptability**: This measure reflects the willingness of people and organizations to participate in the surveillance system. To assess acceptability, the points of interaction between the system and its participants must be considered. The following criteria may be used to measure acceptability: subject or agency participation rate; interview completion rates and question refusal rates (if relevant); completeness of report forms; data source reporting rate; and timeline of data reporting.
e. **Sensitivity**: The sensitivity of a system can be considered on two levels. First, at the level of case reporting, sensitivity refers to the proportion of cases of a disease (or other health-related event) detected by the surveillance system. Second, sensitivity can refer to the ability to detect outbreaks or the ability to monitor changes in the number of cases over time. The primary emphasis in assessing sensitivity (assuming that most reported cases are correctly classified) is on estimating the proportion of the total number of cases in the population under surveillance being detected by the system, represented in Table 1 by \( \frac{A}{A+C} \).

<table>
<thead>
<tr>
<th>Injury Patients Detected by the Surveillance System</th>
<th>Injury Patients Detected by “Gold Standard”</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td><strong>True Positive</strong></td>
<td>Injury patients correctly registered by the Surveillance System</td>
<td><strong>A</strong></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td><strong>False Positive</strong></td>
<td>Patients incorrectly registered by the Surveillance System as injury patients</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td><strong>A+B</strong></td>
</tr>
<tr>
<td>No</td>
<td><strong>False Negative</strong></td>
<td>Injury patients incorrectly not registered by the Surveillance System</td>
<td><strong>C</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>True Negative</td>
<td>Patients correctly not registered by the system, because the cause was different than injury</td>
<td><strong>D</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>C+D</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>A+C</strong></td>
<td><strong>B+D</strong></td>
<td><strong>A+B+C+D</strong></td>
<td>Total patients for all causes</td>
</tr>
</tbody>
</table>

The measurement of the sensitivity of a surveillance system requires collection of or access to data that are usually external to the system, to determine the true frequency of the condition in the population under surveillance, and linkage of surveillance system cases with true cases, to determine if the surveillance system cases are true positives.

f. **Predictive Value Positive (PVP)**: This is the proportion of reported cases that actually have the health-related event under surveillance. In assessing PVP, the primary emphasis is to confirm cases reported through the surveillance system. To assess the PVP of the system adequately, calculating more than one measurement of PVP might be necessary. For example, PVP could also be determined for the system’s individual data fields, for each data source or combination of data sources, or for specific health-related events (e.g., hospitalization for the condition). In Table 2, PVP is represented by \( \frac{A}{A+B} \).
Table 2. Calculation of Predictive Value Positive for a Surveillance System

Predictive Value Positive = \( \frac{A}{A+B} \)

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>A+B</td>
</tr>
<tr>
<td>Yes</td>
<td>True Positive</td>
<td>False Positive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Injury patients correctly registered by the Surveillance System</td>
<td>Patients incorrectly registered by the Surveillance System as injury patients</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>False Negative</td>
<td>True Negative</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Injury patients incorrectly not registered by the Surveillance System</td>
<td>Patients correctly not registered by the system, because the cause was different than injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A+C</td>
<td>B+D</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example:

A hypothetical example (Table 3) compares data from a hospital statistics office (used as the gold standard) with data from an injury surveillance system based in the emergency rooms of the same hospital.

The statistics office in the hospital reported a total of 97,482 patients attended by all causes in emergency department in 2000. Of those, 28,311 were classified as injury patients.

The injury surveillance system reported 27,482 injury patients in the same year. Of those, 491 were incorrectly included as injury patients, and 1,320 injury patients were not registered by the system.
<table>
<thead>
<tr>
<th>Injury Patients Detected by the Surveillance System</th>
<th>Injury Patients Detected by “Gold Standard”</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>True Positive</strong></td>
<td><strong>A</strong></td>
<td>26,991 Injury patients correctly registered by the Surveillance System</td>
</tr>
<tr>
<td><strong>False Positive</strong></td>
<td><strong>B</strong></td>
<td>491 Patients incorrectly registered by the Surveillance System as injury patients</td>
</tr>
<tr>
<td><strong>False Negative</strong></td>
<td><strong>C</strong></td>
<td>1,320 Injury patients incorrectly not registered by the Surveillance System</td>
</tr>
<tr>
<td><strong>True Negative</strong></td>
<td><strong>D</strong></td>
<td>68,680 Patients correctly not registered by the system, because the cause was different than injury</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
A+C & = 26,991 + 1,320 = 28,311 \\
B+D & = 491 + 68,680 = 70,071 \\
A+B+C+D & = 26,991 + 491 + 1,320 + 68,680 = 97,482 \\
\end{align*}
\]

Sensitivity = \( \frac{A}{A+C} \): \( \frac{26,991}{28,311} = 0.9533 \)

Predictive Value Positive = \( \frac{A}{A+B} \): \( \frac{26,991}{27,482} = 0.9821 \)

g. **Representativeness:** A public health surveillance system that has good representativeness is one that accurately describes the occurrence of a health-related event over time and its distribution in the population by place and person. Representativeness is assessed by comparing the characteristics of reported events to all such actual events. It could be examined through special studies that seek to identify a sample of all true cases and to compare these samples with reported cases. A system with 100% sensitivity is highly representative.

h. **Timeliness:** This measure reflects the speed between steps in a public health surveillance system. The interval usually considered first is the amount of time between the onset of a health-related event and the reporting of that event to the public health agency responsible for instituting control and prevention measures. The timeliness of a public health surveillance system should be evaluated in terms of availability of information for control of a health-related event. The need for rapid response in a surveillance system depends on the nature of the health-related event under surveillance and the objectives of that system. The increasing use of electronic data collection from reporting sources, via the Internet, and the increasing use of electronic data interchange by surveillance systems, might promote timeliness.
i. **Stability**: This measure assesses the reliability (i.e., the ability to collect, manage, and provide data properly without failure) and availability (the ability to be operational when it is needed) of the public health surveillance system. A lack of dedicated resources might affect the stability of a public health surveillance system. A more formal assessment of the system’s stability can be made through modeling procedures. Stability largely reflects the dependability and robustness of data processing equipment.

1.5. **Justify and State Conclusions and Make Recommendations**

Evaluation conclusions can be reached through appropriate analysis, synthesis, interpretation, and judgment of the gathered evidence for performance of the public health surveillance system. Recommendations should address the modification or continuation of the public health surveillance system. Efforts to improve sensitivity, PVP, representativeness, timeliness, and stability can increase the cost of the system, although savings in efficiency with computer technology might offset some of these costs.

1.6. **Use Evaluation Findings and Share Lessons Learned**

Deliberate effort is needed to ensure that the findings from a public health surveillance system evaluation are used and disseminated appropriately. Strategies for communicating evaluation findings and recommendations should be tailored to relevant audiences, including those who provided data used for the evaluation.

2. **Review Public Health Indicators Proposed to Monitor Injuries**

An injury indicator describes a health outcome of an injury, such as hospitalization or death, or a factor known to be associated with an injury, such as a risk or protective factor, within a specified population. Indicators are statistical measures used to monitor progress toward a desired outcome. There are a number of different indicators available to study the severity of the problem of injuries in a country or a region.

The Inter-American Coalition for the Prevention of Violence, an alliance of seven agencies, has proposed a set of indicators to be used by countries of the Americas to monitor violence in the region. The following organizations are involved in this coalition:

- Inter-American Development Bank (IADB)
- Pan American Health Organization (PAHO)
- World Health Organization (WHO)
- Centers for Disease Control and Prevention (CDC)
We’ve also identified a number of strategies considered ineffective in reducing injury, such as: seat belt convincer, defensive driving classes, “Mr. Yuck” stickers, coloring books, and the like. It is equally important employ the lessons learned from those programs that do not work.
Two major components of violence, self-directed (suicides and parasuicides) and interpersonal violence, were considered for monitoring. Indicators were built on three objectively measurable outcomes of violence: death, illness, and violent behaviors, including crimes. Applying those indicators proposed by the Coalition is not always possible because few injury data are generated uniformly in these countries. Furthermore, the denominators needed to calculate some of these indicators usually are not available; or if available, the denominators may not be broken down by standard age categories. The indicators are classified as follows:

2.1 Basic Indicators

These indicators are considered basic because they can be generated from information systems that exist in all countries of the Americas. Data on deaths usually can be obtained from the health sector, police, forensic office, or national statistics office. This information and a standard population are necessary to calculate adjusted rates. The information related to assault, robbery, and kidnapping may be found in offices of the police, district attorney, human rights, etc. The basic indicators are:

- Age-adjusted suicide rate, per 100,000 population;
- Age-adjusted homicide rate among males aged 15–44 years, per 100,000 population;
- Age-adjusted homicide rate among females aged 15–44 years, per 100,000 population;
- Homicide rate among children aged 0–4 years, per 100,000 population;
- Reports of assault, per 1,000 population;
- Reports of robbery, per 1,000 population;
- Reports of kidnapping, per 1,000 population.

Developmental Indicators

The information needed for these indicators is not uniformly available in all countries of the Americas. For example, deaths due to intimate partner violence (IPV), child abuse, or elder abuse are hard to find because information about the relationship between the perpetrator and victim is not routinely collected in the information systems. Hospital discharge data is shared data and generally does not reflect context. Data for civil rights violations may be collected by NGOs or special offices in the government, but this information is hard to get. Information about child maltreatment and school fights might be found through surveys. Developmental indicators include both morbidity and mortality data to yield a
The survey, interview script, or questionnaire is the data-gathering instrument.

This list includes several issues that should be addressed when developing a survey and questions:
- types and character of questions
- time from event
- length of survey
- validating questions prior to survey start.
Data Collection Planning
HIPAA of 1996

“Privacy rule expressly permits disclosures without individual authorization to public health authorities authorized by law to collect or receive the information for the purpose of preventing or controlling disease, injury, or disability, including by not limited to public health surveillance, investigation, and intervention”.

more balanced assessment of violence. The first level of indicators requires morbidity data that parallels basic mortality indicators and that should be available in a minimally functioning hospital information system. The second and third levels require increasingly more effort to collect the data.

Level I:
- Age-adjusted death rate due to IPV, per 100,000 population;
- Death rate due to child abuse, per 1,000 population;
- Death rate due to elder abuse, per 100,000 population;
- Age-adjusted homicide rate due to robbery, per 100,000 population;
- Age-adjusted hospital discharge rate due to suicide attempts per 100,000 population;
- Age-adjusted hospital discharge rate due to assault of males aged 15–44 years, per 100,000 population;
- Age-adjusted hospital discharge rate due to assault of females aged 15–44 years, per 100,000 population;
- Hospital discharge rate due to assault of children aged less than 5 years, per 100,000 population;
- Hospital discharge rate for assault of the elderly, per 100,000 population;
- Reported civil rights violations, per 1,000 population;
- Reported cases of child maltreatment, per 1,000 population aged less than 5 years;
- Reported cases of school fights, per 100,000 population of school-aged children, per year.

Level II:
- Age-adjusted hospital discharge rate for assault resulting from IPV, per 100,000 population;
- Hospital discharge rate for assault resulting from child abuse, per 100,000 population;
- Hospital discharge rate for assaults due to elder abuse, per 100,000 population.
Level III:

- Age-adjusted rate of emergency-room visits due to suicide attempts, per 100,000 population;
- Age-adjusted rate of emergency-room visits among males aged 15–44 years due to assaults, per 100,000 population;
- Age-adjusted emergency-room visit rates due to assaults resulting from IPV, per 100,000 population;
- Emergency-room visit rates due to assaults resulting from child abuse, per 100,000 population;
- Emergency-room visit rates for assaults due to elder abuse, per 100,000 population.

2.2 Research Indicators

Data to build research indicators are not routinely available; however, these data may be obtained through surveys or special research. Such data can include:

- Rate of suicide ideation, per 100,000 population;
- Rate of suicide attempts in past 12 months;
- Self-reported weapon-carrying rate among adolescents at school, per 100 school children;
- Self-reported fighting rate among adolescents at school, per 100 school children;
- Self-reported rate of IPV, per 100,000 respondents.
Exercise: Working in three groups, select basic, developmental, and research indicators for IPV. Answer the following questions:

1. In your region, is it easy to obtain data to build the selected indicators?
2. Do the indicators provide information that is useful to monitor this event?
3. How can you use these indicators to monitor public health issues in your country?

3. **Use Injury Surveillance Data to Monitor Prevention Activities**

Injury surveillance data provides information that can be useful to:

- Monitor the association of the implementation of prevention strategies with changes in the number, rate and characteristics of injury, which allows decision makers to decide whether or not to continue the prevention activities.
- Monitor changes in the trend of an event before and after a strategy is applied (i.e., helmet or seat belt law).
- Monitor the impact of strategies applied for purposes other than injury prevention that could positively or negatively affect the events under surveillance (i.e., firearm restriction during an election period).
- Possible over- or under-representation of certain groups in the population (elderly people, youth, men, women, etc.).
- Possible over or under presence of some types of events in areas of the city or region (clusters of events in specific areas).

- **Examples:**

  a. An evaluation of the impact of child-resistant drug packaging illustrates the usefulness of both multiple assessments and active or passive surveillance systems for monitoring trends. In this case, trend data from poison control centers documented steep declines in unintentional poisoning deaths and ingestions by children after new packaging policies were put into place. A review of annual mortality rates associated with unintentional ingestion of oral prescription drugs for children less than 5 years of age also showed that mortality rates declined 45% from the period before policy implementation through 1992.9

  b. Motorcyclist deaths have been an important public health problem in Cali. Motorcyclists accounted for 30% of motor vehicle-related deaths during the past 10 years. Different strategies have been implemented to address this problem (Figure 3). The Fatal Injury Surveillance System established in
Using Data to **Evaluate** Programs

- Help develop intervention materials
- Analyze effectiveness of methods used
- Use evaluation to improve prevention measures

Once we identify the measures to be used in reducing an injury problem, we must evaluate their potential effectiveness in reducing the problem (“will it work here?”). Hopefully, one is using a proven intervention. Once you determine your intervention, don’t forget to plan for evaluation. Next, **implement** the measures with a blend of both **marketing** (attractively selling the measure to the public) and **advocacy** (effectively gaining community leaders’ and members’ support). Following this, we **evaluate** our prevention measures to (a) identify their effectiveness and (b) make improvements and/or additions to the prevention measures. Evaluation can also be used to develop intervention materials such as brochures, pamphlets and other materials.
Who can remember the Public Health Approach?

What’s the first step? (defining the specific injury problem)
Then where do we go? (identifying the specific factors involved in the problem)
Next? (identifying solutions to the problem)
And Finally? (implementing AND evaluating the preventive measures that reduce the problem;) It’s very important to include the evaluation of the prevention measures, in order to verify the success or failure of the preventive measures in reducing the injury problem.)

And, if you remember from Level 1...
Traditional health care often focuses on the TREATMENT of the individual.
The public health focuses on the PREVENTION of disease and disability in the overall population.

Injury prevention serves both the community and the individual.
A Public Health Approach:

Starts with defining the problem and moves toward identifying risk and protective factors.

It also includes developing, implementing, and evaluating injury prevention interventions.

Public Health often takes a two pronged approach to health care; concern with the health of the public in general, as well as the health of individuals within the public.

In injury prevention we tend to focus on both.

Let’s all read this together (READ GRAPHIC). As you can see, the public health approach calls for us to do four things:

- identify the specific problem
- identify the various factors that contribute to the problem
- identify, develop, and evaluate potential preventive measures to reduce the problem
  (sometimes this involves a pilot project before full implementation in a community)
Cali has been useful for monitoring the trend of motorcyclist fatalities before and after each strategy was implemented.10

**Figure 3. Motorcyclist Deaths and Interventions in Cali, Colombia, 1993–2002**

**Exercise:** Working in two groups, give your opinions about the impact of prevention strategies applied in Cali and Samoa.
4. **Summary**

Now that you have completed this session, you should be able to:

- Know the steps to evaluating an injury surveillance system.
- Review public health indicators proposed for monitoring injuries.
- Use surveillance data to monitor prevention activities.

You have completed the *Injury Surveillance Training Manual!* You are now able to:

- Understand the conceptual framework of injury prevention;
- Assess injury data sources and describe the injury problem;
- Build a coalition to support the injury surveillance system and prevention activities;
- Determine the appropriate methodology for the surveillance system;
- Define and develop an analysis plan for the surveillance data;
- Use injury surveillance data to inform injury prevention;
- Define an evaluation plan for the surveillance system and monitor prevention activities.

You are now ready to establish an injury surveillance system in your region or country.

**Congratulations!**
Steps to Develop and Maintain an Injury Surveillance System

1. Understand the conceptual framework of injury prevention
   Define and understand typology of unintentional and violence-related injuries

2. Assess injury data sources and describe the injury problem
   Identify strengths and weakness of injury data sources and size of the problem

3. Build a coalition to support the injury surveillance system and prevention activities
   Identify partners to include in a coalition to support the injury surveillance system

4. Determine the appropriate methodology for the surveillance system
   Determine events, data elements, type of surveillance, and data-collection instruments

5. Define and develop an analysis plan for the surveillance data
   Calculate indicators, demographics, and environmental characteristics

6. Use injury surveillance data to inform injury prevention
   Use data to identify preventable injuries, high-risk groups, and most appropriate interventions

7. Define an evaluation plan for the surveillance system and monitor prevention activities
   Apply the criteria to evaluate the surveillance system and monitor the strategies

REFERENCES


