

7. Design and steps for setting up an ESS

Design of an ESS implies adopting a basic methodology so that the objectives and mechanisms of work are defined from the beginning. The following steps illustrate the process of planning an ESS.

7.1. Definition of case and variables:

7.1.1 Case definition. In every ESS the definition of a case, that is, what is going to be registered or monitored, is a determining factor that allows the system to fulfill its objectives. This is the first agreement that must be reached by the authorities and those who will “operate” the ESS. The more precise the case definition, the greater the likelihood that victims will be identified using the same criteria and thus distinguished from those who do not qualify as cases. This is the way to obtain an ordered, standardized, and systematic selection of people who have suffered the kind of violence that is the object of the ESS. A case definition for an ESS may vary with respect to other epidemiological surveillance systems (with differences that may relate to the various legal contexts in different countries), but there should exist a single definition within a country or region. Unanimity in case identification helps to ensure internal validity and avoid selection biases.

Reaching a case definition is not always as simple as it may seem. For example, from a legal standpoint, a case in which a criminal dies as a result of police action during a robbery can be differentiated from a case in which the robber himself kills a policeman. In the first case there is no homicide, but rather a legal action or intervention, while in the second there is a homicide—although in both cases the intent of the action is the same, to kill the opponent.

The ESS should define, in accordance with its objectives, how to record each of these cases: whether to classify one as homicide and the other as death by legal intervention, or simply to classify both as homicides.

In the case of violence against women, it is necessary to define clearly the types of acts against women that will be included as violent events. It is recognized that physical, psychological, or sexual violence, as well as deprivation of rights, are all ways of exerting gender violence and should be identified as such. Moreover, one form of violence tends to intertwine with others: for example, physical or sexual abuse causes psychological harm. Similarly, domestic violence is not limited exclusively to what happens in the domestic setting, that is, the physical space of the home, but applies to any interaction between people who are related by blood or marriage. **A case definition of domestic violence will include, accordingly, all cases that occur within or outside the home environment, and that involve psychological, physical, or sexual violence between people with family ties.**

These concepts are defined in the respective protocols so that they can be applied similarly in the different places where cases are treated or reported (health facility, police station, forensic service, family services office, youth residence, etc.). In order to achieve this, the concepts and variables under study must be clearly defined.

Use of definitions that have broad acceptance, including international acceptance insofar as possible, is recommended. These may be legal definitions for homicide, or medical definitions for nonfatal injuries, or definitions defined by consensus among NGOs for domestic violence.

International codes, in particular those of the International Classification of Diseases (Tables 4 and 5, ICD-9 and ICD-10), should be widely used for the final reports, in order to permit national and international comparisons and monitoring.

Once a case or an event is defined, epidemiological surveillance can also help to identify risk factors that then will be analyzed for associations, construction of typologies, and characteristics that lead to acts of violence. In this regard it is also necessary to define the criteria for identifying and classifying risks. For example, what is understood by a “motive” or “reason” for a violent event? Is a quarrel a motive, or is it a way of expressing a difference or conflict not otherwise resolved? With a margin of error not yet established, revenge for some supposed reason and economic debt have been classified, in particular by police entities, as possible motives for homicide or intentional injury; however, their broad use and acceptance seem to reflect, in some countries, a lack of knowledge and weak efforts to pursue an in-depth criminal investigation, rather than an accurate classification. A careful review of such labeling would probably produce changes in the profiles of events.

7.1.2 Variables. Presented below is a group of basic variables related to person, place, time, and some circumstances or characteristics of violent acts, for inclusion in an epidemiological surveillance system on violence. The list should be modified or expanded according to the defined objectives. Table 1 includes a short definition, sources of data, and usefulness for each variable.

Table 1. Variables related to person, time, and place of an act of violence

Variable	Definition	Type of Measurement	Sources	Usefulness
Age	Years, months, or days completed	Quantitative	Identification document, informant, police	Identification of risk groups
Sex	Male, female	Categorical	Informant, police, health institution, forensic office	Identification of risk
Date of the act	Day-month-year	Day-month-year	Family, police, prosecutor's office, health institution	Time, trends
Neighborhood	Place of residence Place event occurred	Categorical Categorical	Informant, police, health institutions	Groupings, mapping
Marital status	Single, married, widowed, separated, minor	Categorical	Informant, social services, counseling, police	Identification of risks
Relationship with the aggressor	Spouse, father/mother, known, unknown	Categorical	Informant, police, social services	Identification of risks
Occupation	Basic	Categorical	Informant, police, health institutions	Identification of risks
Socioeconomic status	According to local or national definition Local planning	Categorical	Local planning	Identification of risks, ecological groupings
Education	Years of schooling Level reached	Quantitative Categorical	Informant, police, health institutions	Identification of risks
Type of weapon	Firearm, sharp object, explosive, blunt object, poison, hanging	Categorical	Police, prosecutor's office, forensic office	Identification of risks
Alcohol level	Blood alcohol level in mg per hundred ml	Quantitative	Police, prosecutor's office, transit police, family, forensic office	Identification of risks
Motive for the act	Revenge, politics, robbery, drugs, other	Categorical	Police, prosecutor's office, forensic office, family	Identification of motives, design of prevention
Location of the act	House, street, bar, workplace	Categorical	Police, community, family	Definition of risk zones
Special categories of people	Drug addicts, indigents, scavengers, etc.	Categorical	Police, health institutions, community, family	Identification of risk groups

Source: Concha-Eastman A & Guerrero R, *Rev Panam Salud Pública / Pan Amer J Public Health*, 5(4/5), 1999.

7.2. Identification of existing data sources

Because violence is both a social and a public health problem, various disciplines and institutions must mount combined efforts for its control, prevention, treatment, and/or solution, and they must be adequately informed and motivated to do so. It is usual for several different institutions to obtain information on acts of violence, since these acts have characteristics and implications that involve both the health and legal systems. As a result, it is important to secure the participation of all institutions that are assigned responsibility for data collection, according to their functions.

Institutions or groups that need to make a commitment to the ESS should be identified, without excluding any in advance. However, this does not involve creating a bureaucratic entity. Institutions and groups should be selected and defined in accordance with **minimum criteria**:

- 1) The type of responsibility they have for control, treatment, prevention, or rehabilitation of cases.
- 2) The data they routinely collect, the formats and techniques they use for data collection, and the types of analyses they carry out.
- 3) Their willingness to share information with other institutions, and limitations on information-sharing (judicial confidentiality, privacy of informants) (Table 2).

7.3. Formation of a working group or technical committee

No single or isolated entity can carry out all the actions needed to address the problem comprehensively. Such integration between institutions does not happen immediately. In many cases the entities involved have never worked together before, and there will be various difficulties to overcome in the course of setting up and implementing joint activities.

Information on specific events, such as a homicide or traffic accident, must be collected by the police, the prosecutor's office, and/or the transit authorities, according to the standards of the particular country. Each institution performs this task using its own format and in line with its particular interests. The police can contribute information on the motive for a crime or describe the scene of a crash between two vehicles. However, police typically provide little information about the victims' injuries. Emergency services and hospitals will have more information on this question and can provide more data related to the clinical condition of the injured or the cost of health services associated with an event.

The following **examples of intersectoral work** illustrate the potential of combined efforts.



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In Cali, Colombia, a working group has been functioning since 1993. Once common objectives were defined, the group decided to share information on deaths from external causes. Every week, with coordination by an epidemiologist, representatives from the public health sector, district attorney's office, police, transit authorities, forensic medicine, and human rights groups review the data that each has collected on events involving deaths from external causes, both intentional and unintentional. The basic task is to ensure the consistency and homogeneity of the data collected independently by each institution. Frequently one institution will omit a case that another institution includes. Comparing multiple data sources avoids duplicate counting of cases. Once all the cases for each institution are confirmed, they are entered into a database along with variables related to time, place, person, type of event, and characteristics of the event. Analysis of the database results in weekly, monthly, and annual reports; monthly and annual consolidated reports are sent to the mayor and other authorities to support their analysis and decision-making. A weekly master table summarizes the data consolidated by the working group. The reports generated by this work of the Office on Epidemiol-

ogy of Violence, which carries out the coordination, have been recognized as being of excellent quality³⁶. The preparation of regular reports on a timely basis has made it possible to evaluate patterns of deaths from external causes in the city.

In Quito, Ecuador, in 1998, by decision of the mayor, a Permanent Intersectoral Technical Committee for Information on injuries, domestic violence, and crimes against property was formed for the Historical Center of Quito. The committee included the police, the Ministry of Health, the E. Espejo General Hospital, women's groups, forensic medicine specialists, and representatives of the community. Based on a pilot study carried out in June and July 1999, it was decided to continue this model permanently and to extend it beyond the Historical Center of Quito to the entire city. The pilot study made it possible to construct an initial database on the magnitude of the problems being investigated, to make adjustments in operational mechanisms, and to invite other institutions to participate. The mayor and the members of this committee intend to define prevention projects that rely on the information generated. PAHO has supported this process.

In Honduras, a presidential decision in 1999 led to the formation of an Intersectoral Committee for Prevention of Violence, with direct participation of the ministers of security and health, the police, forensic medicine specialists, women's NGOs, universities, and others, to improve the information systems and develop prevention projects. The process of organization is currently under way. Contacts among the institutions involved have made it possible to identify serious inconsistencies in data produced by each entity. Initially, information was recorded only on homicides, and there is obvious need to improve and standardize such information. PAHO is cooperating with this process.

In Guatemala, after several debates, a single form was designed for recording complaints of domestic violence, which can be used in any institution where the victim seeks support. This unified form or "certificate" makes it possible to have a single registry of cases. Women's groups, the Office for the Defense of Human Rights, the Social Secretariat of the Presidency, child protection centers, and the health sector have all contributed to this effort. The Program on Women, Health, and Development of PAHO has participated actively throughout this process.

A working group is a coalition that is necessary for the creation of an ESS. In addition to improving the quality of the information gathered, such a group facilitates information dissemination and increases the possibilities for research and data reporting. Some of the sectors, institutions, and actors that can be involved in this kind of work at the national, regional, or local level are illustrated in Table 2. It should be noted that only those institutions that are relevant to the objectives of the work should take part in these groups.

Table 2. Possible Partners in an Intersectoral Coalition for Creation of an ESS

Sector	Institution	Level of participants
Health	Ministry of Health Hospitals Health centers Health posts	Epidemiologists, doctors, nurses, health educators, health promoters, paramedics, other health workers
Justice	Forensic medicine office Courts Public defenders' office Prosecutor's office Family services or counseling	Forensic pathologists, judges, public defenders, prosecutors or assistants Directors or professional staff of family services or family counseling
Security	Police Security companies	Regional or local police chiefs, statistical officers
Transit	Transit departments and offices	Department directors or traffic police, statistical section
Administration	Planning departments National and provincial statistical departments	Statisticians, geographers
Education	Universities Colleges Schools	Researchers, professors, student leaders
Community	Community organizations Youth organizations	Community leaders, youth leaders, community groups
Private organizations	Nongovernmental organizations Human rights groups Insurance agencies	Spokespersons and leaders of private organizations, statisticians
Political	National, regional, and local authorities	Staff in the president's, governor's, or mayor's office
Media	Television, radio, newspapers	Journalists

7.4. Determination of the strengths and limitations of each data source

The technical committee should know the precise definitions of the variables to be collected and the quality control methods to be used in the ESS. At the same time, it should understand the structure of the ESS, the format of reports (printed or electronic) and backup copies, the period of time covered, the frequency of data collection, the form and frequency of dissemination of results, the most recent period of collection, the system for coding of data, the possibility for obtaining tabulations of individual data, the feasibility of accessing the original sources of data, the available geographic information, and the types of violence or injury that is being tabulated or processed. **It is recommended that the ESS be set up initially with the fewest possible sources, in order to keep it simple.**

7.5. Preliminary data analysis or pilot study

The next step is to carry out a **preliminary analysis or pilot study in order to identify more clearly the nature and characteristics of the problem under study.** Such a study will also reveal deficiencies in the flow, collection, and characteristics of the data as well as the strengths of the system. To the extent that these weaknesses and strengths are described accurately, the quality of the ESS will improve. The pilot

study will make it possible to reevaluate the objectives of the ESS and redefine them if necessary or if other criteria arise. It will show the deficiencies and strengths in the definitions of the variables being collected; deficiencies can be corrected to the extent that they are identified. The concepts of evaluation of an ESS, to be described below, will be used as part of the pilot study.

7.6. Consideration of integration of data from multiple sources

Integration of different sources of information is usually low-cost and provides new and valuable knowledge. For example, when data on a homicide is needed, a hospital or public health office can provide information on the clinical characteristics of the injury, its severity, and its anatomical location, among other details. The police for their part will provide variables having to do with the intent of the perpetrator, conditions at the scene, and the motives for the act. In the case of a culpable death due to a traffic accident, the traffic authorities can give information on the vehicle, legal aspects, and road conditions. Linking or associating different sources of data gives greater possibilities for evaluating interventions and generating hypotheses.

The privacy of the subjects under study should be protected, especially when clinical histories are involved or data sources are consulted that are not in the public domain; these may contain sensitive information. Variables should be defined that can serve as identifiers for integrating different data sources, such as full name, date of birth, or identification card number.

7.7. Dissemination of information

Consideration of recipients, dissemination mechanisms, frequency and type of reports, publications.

7.7.1 The recipients with whom an ESS interacts can be grouped as follows:

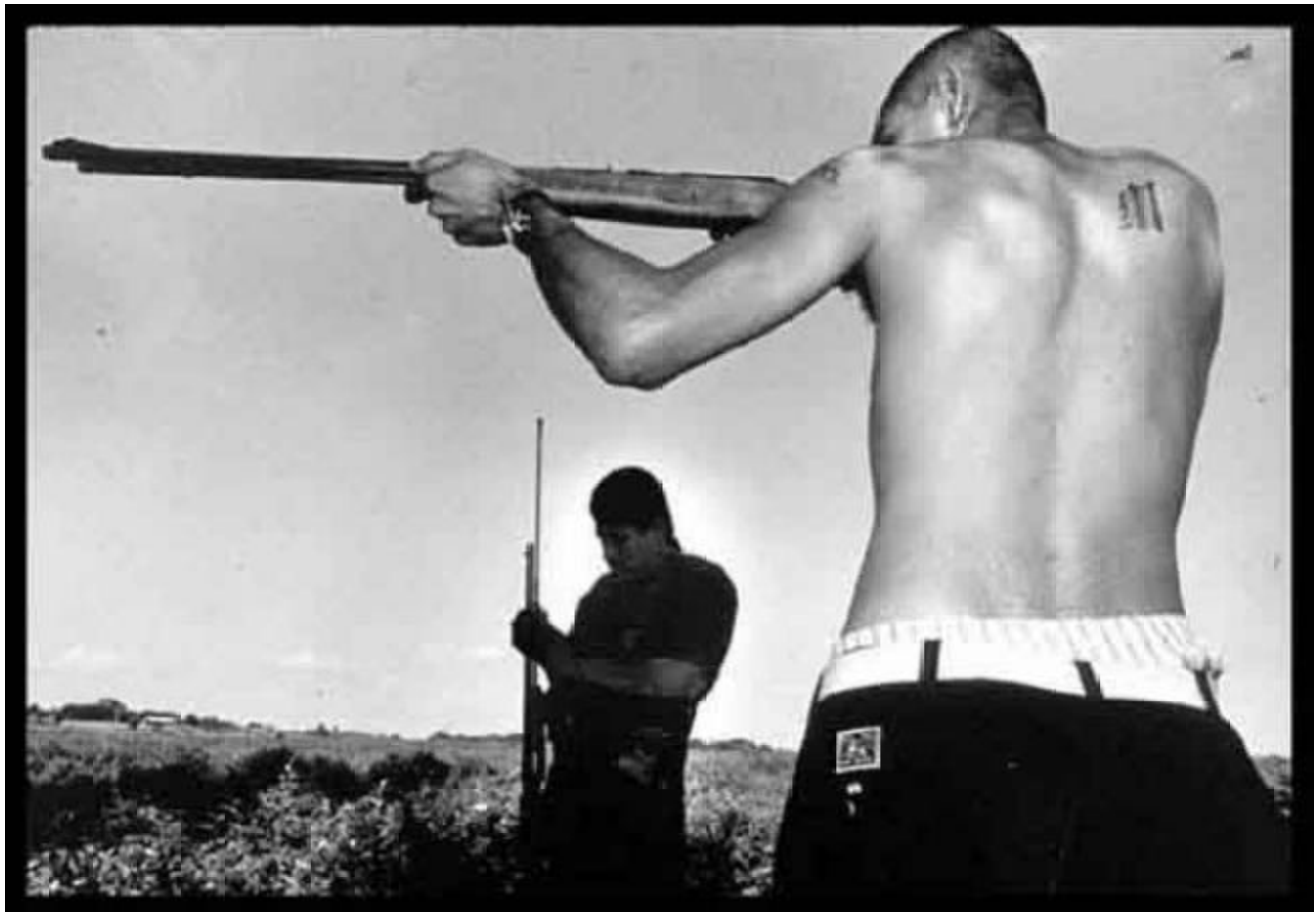
- a) The authorities and other decision-makers: these are the primary recipients.
- b) Affected communities: they not only should know the magnitude of the problem, but also should participate actively in decisions and their implementation.
- c) The communications media: newspapers, radio, and television.
- d) Nongovernmental institutions, universities, and centers that study the problem.
- e) Those who participate in the ESS process in one way or another. They have the right to receive the final reports, and moreover, to the extent that they can see the usefulness of their work, their interest and commitment to the process will be stimulated.

Data and analyses generated by the ESS should take into

account the recipients. In preparing a report for those who have political decision-making power, it is necessary to include not only the tables but also the conclusions and recommendations derived from the ESS. Detailed and technically prepared reports should be available, as well as summary reports.

7.7.2 Frequency of reports: The frequency of reports is defined based on the importance of the problem. **As a general rule, not more than six months should elapse** before the information is distributed to those who use it to make decisions. Otherwise, the data lose their timeliness.

One can also produce annual reports for the purpose of helping to identify trends, patterns of change, or stability of the problem. The National Reference Center on Violence of the Forensic Medicine Institute of Bogotá, Colombia, produces monthly and annual reports on deaths from intentional and unintentional injuries⁴⁴. These have made it possible to track, reliably, the magnitude of the different forms of violence plaguing the country, since the Institute provides national coverage and is responsible for performing autopsies for all deaths from external causes as well as tracking cases of



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sexual abuse, rape, or domestic violence that are reported to the responsible authorities.

Epidemiological surveillance systems also have deficiencies; despite the efforts made, data can be incomplete. Even so, the information is still useful and should be disseminated. Doing so makes it possible to raise awareness and bring about changes in the attitudes of the authorities and the society toward the problem. It is possible that basic data, even when incomplete, can help to identify risk factors, such as the time of day and geographic areas with the greatest frequency of cases, predominant forms of aggression, types of weapon used, identification of perpetrators and their characteristics, frequency and number of assaults, family or economic impacts, and other variables included in the ESS. In cases of automobile accidents, the information might include the ages of those involved but not precise data on the blood alcohol level of the driver or others, or it might include only the results of alcoholic breath tests. Even so, it is possible to make decisions based on the risks identified and to decide on mechanisms to improve the registries, based on experience.

Every report should acknowledge limitations and possible biases of the information. These limitations can be mentioned briefly in the body of the report and described in more detail in appendixes to the main text, to provide a better understanding for the authorities, communities, the media, and researchers.

7.8. Association of the ESS with preventive actions and sources of financing

The cost-benefit relation is of utmost importance. Some studies have shown that the costs of preventing injuries typically are lower than the costs of medical treatment, rehabilitation, and the loss of productivity that occurs as a consequence of violent events^{45–49}. For individuals, prevention costs are minimal if compared with the costs of medical or surgical treatment, as well as the wage losses that follow a violent act. For health systems, the costs of treatment are usually much higher than the costs of preventive measures.

In short, the goal is to translate the data obtained into concrete preventive actions in an organized way. In cities such as Rio de Janeiro, among others, the right to carry guns has been restricted in view of the fact that between 60% and 80% of homicides are committed with firearms, a finding based on ES reports¹⁶. Epidemiological surveillance systems have made it possible to evaluate the effectiveness of weapons restriction policies and of police activities, as well as the effect of the laws and their relation to homicide prevention. There are also epidemiological surveillance systems that study the knowledge, attitudes, and practices of the population in regard to one or more subjects. For example, the Youth Risk Behaviors Surveillance System (YRBSS) of the United States studies the knowledge, attitudes, and practices of the juvenile population with regard to risky behaviors such as drug and alcohol consumption, among others, for the purpose of guiding prevention programs.

Basic points in setting up an effective ESS:1. *Definition of objectives*

- Define the problem to study, ways of addressing the problem, and the institutions able to provide relevant information.
- Reach agreements on OPERATIONAL DEFINITIONS

2. *Formation of a working group or technical committee*

- Decide what information will be obtained, who will provide it, how, and with what frequency.

3. *Identification of existing sources of information*

- Identify the specific data sources that are available in each institution.

4. *Determination of strengths and limitations of each source*

- Determine which information variables are useful and which are not, avoiding repetition of information.

5. *Preliminary data analysis*

- Evaluate, on a preliminary basis, the quality of the variables in the data collected, the ease of collection, percentage of information obtained, period of delay in collecting the data, quality of the data, and attributes of the ESS.

6. *Consideration of integration of data from multiple sources*

- It is frequently necessary to combine existing sources of information to obtain more complete data on a type of event or injury.

7. *Plan for dissemination of the information*

- Determine who will receive the information and the frequency and level of detail with which it will be provided.

8. *Association of the ESS with preventive actions and sources of financing*

- Suggest or design possible preventive actions. Ensure sources of financing from the participating institutions.