Regional Workshop on Basic Environmental Health Indicators
U.S. – Mexico Border

Tijuana, BC, Mexico
August 13 – 15, 2003
BACKGROUND

Several efforts have been undertaken on the U.S.-Mexico Border to determine the effects of environmental deterioration on the health and quality of life of the population, particularly as it concerns the most vulnerable groups, including the poor, children, women and senior citizens.

The characteristics of the U.S.-Mexico border region that influence the health of border communities include: rapid urbanization, growing industrial and manufacturing development and occupational risks, the rising number of adult child workers resulting from migration patterns, a high incidence of poverty, the insufficient supply and inferior quality of drinking water, inadequate treatment and disposal of waste water from homes and industry, solid waste and residual industrial waste, and inefficient management and storage of pesticides, among others.

To understand the elements that are harmful to health in the various components of the environment (air, water, soil, foods working environment, etc.), it is essential that representatives of different sectors and institutions come together to exchange information that may be helpful in developing policies and defining courses of action in environmental surveillance, as well as in promoting health and risk prevention that will lead to good health and productivity in the environment.

Responding to these challenges, in 2001 the PAHO Field Office on the U.S.-Mexico border prepared a concept paper entitled "Environmental Public Health Indicators" in collaboration with experts in Mexico and the United States, as well as Canada's Center for Collaboration on Environmental and Occupational Health. This document establishes a conceptual framework for the collection, exchange, interpretation and utilization of indicators that can determine health and environmental policies affecting border populations and can also serve to assess the effectiveness of measures implemented for this purpose in border locales.

The document also introduces the World Health Organization's DPSEEA model, adopted at the two indicator workshops held by the PAHO Field Office: the first in Ciudad Juárez in June 2000, and the second in El Paso in July 2001. In these workshops, there was participation by representatives of local, state and federal governments of both countries. The document also presents a basic set of indicators for local authorities from various sectors to choose from, selecting those of mutual benefit or others not specified. Thus, it is not necessary for the sister cities to deal with all the indicators contained in the document from the outset, but rather that they adopt those of greatest relevance and interest as well as those they are best equipped to deal with. The workshop held in McAllen in August 2002 was the first in a series of encounters which the PAHO Field Office intends to conduct between sister cities in order in selecting environmental health indicators. Representatives from sister cities in Texas, Nuevo León, Coahuila and Tamaulipas participated. The second regional meeting was held in Tijuana, Baja California and included representatives of California, Sonora and Baja California. The workshop was organized by the PAHO Field Office and the Baja California Department of health.

GOALS

Implementation of a program of environmental health indicators for sister cities along the U.S.-Mexico border.
PARTICIPANTS

Environmental and health authorities from border states and cities in California, Arizona, Sonora and Baja California.

ORGANIZERS

- Pan American Health Organization's U.S.-Mexico Border Field Office.
- Baja California, Mexico Department of Health

MEETING SITE:

Hotel Camino Real – Tijuana, Baja California

AGENDA

August 13

2:00 - 2:15 p.m. Welcome and Introduction

2:15 - 2:45 p.m. Environmental Health Indicators: Concepts and Criteria for Their Selection and Management PAHO - FEP

2:45 - 3:45 p.m. Health Problems and Their Relation to Environmental Factors on the U.S.-Mexico Border
Representative from the U.S. - California
Representative from Mexico – Baja California

3:45 - 4:00 p.m. Methodology for Selecting Indicators and Compiling Environmental Health Data.
PAHO - FEP

4:00 - 5:00 p.m. Review of Basic List of Indicators for the U.S.-Mexico Border
Discussion

August 14

8:30 -10:30 a.m. Working Groups
Preliminary selection of environmental health indicators for sister cities.

Methodology:
Form binational groups, to include professionals from the health and environmental sectors in each border city in both countries.

10:30 -10:45 a.m. Break

10:45 - 12:30 p.m. Working Groups
Validation of indicators selected.
12:30 -1:30 p.m.  Lunch
1:30 - 3:30 p.m.  Working Groups:
Identify means for collection, analysis and evaluation of data concerning
environmental health indicators.
3:30 - 3:45 p.m.  Break
3:45 - 5:30 p.m.  Working Groups
Identifying ways to implement environmental health indicators

August 15

8:30 - 10:30 a.m.  Working Groups
10:30 -11:00 a.m.  Break
11:00 -12:30 p.m.  Conclusions and Recommendations:
Presentation of conclusions reached by working groups.
Future activities
Final comments and wrap-up

METHODOLOGY

The workshop consisted of a series of presentations and group discussions designed to identify
and prioritize environmental health indicators. Of particular interest was the participation of
Kathryn Dowling, a toxicologist from the EPA in California, and Dr. Moisés Rodrigues Lomeli, of
the Department of Environmental Health, State of Baja California, Mexico in Mexicali, who made
presentations on health problems and their relationship with environmental factors on the U.S.-
Mexico border. A copy of the Power Point presentations is included in Appendix 1.

Next, representatives of the PAHO Field Office with technical expertise presented concepts and
criteria for selection and management of environmental indicators and the methodology used by
PAHO/WHO in selecting indicators and collecting environmental health data.

The model developed by the World Health Organization was presented. This is a model which
seeks to employ a broader-based approach incorporating the principal driving forces affecting
pressures in health and the environment. This model was called "Driving forces, Pressures,
State, Exposure, Effect, Action" (DPSEEA) and is useful in dealing with the entire range of
potential forces and resulting actions, bringing together professionals and personnel devoted to
practice and management in the area of public and environmental health, for the purpose of
providing them an overview of the problem.

The basic environmental health indicators applicable to the U.S.-Mexico border region which
were identified at the meeting held in El Paso (based on indicators proposed by major
organizations such as PAHO/WHO, the CDC, the EPA, and DHHS) were also taken into account
in the process of selecting and prioritizing indicators.
Participants conducted an initial analysis by category (water, air, foods, waste, exposure), discussing in turn each area listed in Table A (Appendix 2) of the PAHO Field Office concept paper.

The methodology initially proposed for working groups would have involved the formation of binational groupings including professionals from the health and environmental sectors from each border city in both countries, but because there were no representatives from Arizona, the participants suggested that groups be formed based on regional criteria. Groups were created representing California, Sonora and two from Baja California, one for Mexicali and another for Tijuana.

The groups first identified environmental health indicators by category—water, air, hazardous waste, foods, occupational health, and multiple exposure. The 52 indicators selected at the July 26-27, 2001 meeting were ranked using a point system based on the following criteria: impact on health and the environment, impact on political figures and the public, feasibility, ease of implementation, synergy and the extent to which they would complement existing border programs.

All groups discussed the 52 proposed indicators and suggested including others (for example, lead and pesticide poisoning, food quality and marine biotoxins, mapping used tire storage facilities and diseases transmitted by vectors), stressing indicators applicable on both sides of the border, no definitive progress was made in the process of validating and conceptualization of the indicators selected.

The group work was conducted by professionals from the health and environmental sectors of border cities in both countries.

CONCLUSIONS AND RECOMMENDATIONS:

The workshop was attended by 28 persons working in local public health services in sister cities, state public health departments, and border health offices in both countries. The list of participants is included in Appendix 4.

Recommendations made by the participants for action to be taken subsequent to the workshop are as follows:

- PAHO should prepare a preliminary report listing all indicators selected and send it to the participants for final review
- Since binational representation was lacking, participants proposed a second meeting to submit the indicators selected for consideration by a smaller group of experts from the four states for the purpose of validation and conceptualization.
- Participants from California called attention to the need for broader representation with experts from other sectors such as air quality, toxic waste, agriculture and development.
- A final document should be prepared and distributed to all authorities in support of the Border 2012 program.
- The group expressed its concern that the final document serve as a guide for proposals from other programs in development and that progress be made in the process of collecting data and implementing a binational system of surveillance.
- The participants reported that there are other reports about indicators produced by various border institutions which have lacked continuity.
- Each locality should determine the best strategies for implementation in sister cities.
APPENDICES:

1. Presentations
2. Table A
3. Criteria for Ranking Indicators
4. List of Participants
5. List of Abbreviations
### APPENDIX 2
Table A. Indicators held after initial analysis and evaluation by participants in Tijuana, B.C. workshop the days of August 13-15 2003. First score and revision round.

<table>
<thead>
<tr>
<th>1st. OBJECTIVE</th>
<th>WATER</th>
<th>AIR</th>
<th>FOOD</th>
<th>WASTES</th>
<th>MULTIPLE EXPOSURE</th>
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</thead>
<tbody>
<tr>
<td>EVALUATE EXPOSURE AND RISK LEVELS (INCLUDING PERCEPTIONS AND BEHAVIORS)</td>
<td>Percentage of population with access to drinking water by residential connections per county</td>
<td>Environment air concentrations of contaminants controlled in each of the sister cities (include heavy metals, volatile and organic compounds and others.)</td>
<td>Identify unicellular organisms (for the case of marine biotoxins by sample/year of mollusks)</td>
<td>Volume of hazardous waste exported to Mexico</td>
<td>Type and volume of pesticides generated in the border area</td>
</tr>
<tr>
<td></td>
<td>Percentage of population with access to sewage services (elimination of excreta)</td>
<td>Number of days that the corresponding air standard levels were exceeded</td>
<td>Number of detections of unicellular organisms (for the case of marine biotoxins by sample/year of mollusks)</td>
<td>Volume of hazard waste returned to the US</td>
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<td></td>
<td>Quality of water for recreational use.</td>
<td>Percentages of homes that utilize coal, firewood or petroleum as fuel mainly for heating and in the kitchen</td>
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<td>Number of collection sites for used tires, batteries, copper wire, etc.</td>
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<td>Quantities of tires held in centers</td>
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<td>Volume of solid waste per residents generated at the county level</td>
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<td>Percentage of residents living around landfills, by age and gender</td>
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<tr>
<td>2nd. OBJECTIVE</td>
<td>Mortality rate due to diarrhea in children under the age of 5 years (using the international code as reported in Mexico)</td>
<td>Mortality rate due to acute respiratory infections in children under 5 years of age (IRA by age in Mexico or asthma in the US or defined diseases in the CIE9 and CIE10.</td>
<td>Number of outbreaks of food-borne diseases (related with outbreaks with surveillance programs and if they are caused by unicellular organisms.)</td>
<td>Percentage of injuries and intoxications related to chemical spills</td>
<td>Number of intoxication cases due to acute intoxications by pesticides * (desegregated by occupational situation, non-occupational and accidental)</td>
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<tr>
<td></td>
<td>Mortality rate due to diarrhea in children under the age of 5 years (using the international code as reported in the US)</td>
<td>Estimated rates of mortality by pneumonia in children under 5 years and elders</td>
<td>Number of cases by mollusks intoxications by clinical and medical diagnosis</td>
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<td>Estimated mortality rates of tumors (incidence of tumors confirmed by a pathologist)</td>
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<td></td>
<td>Diarrhea mortality in children under 5 years</td>
<td>Asthma incidence by age in both countries</td>
<td>Number of visits to the emergency room by acute asthma episodes</td>
<td>Heavy metal concentrations in blood/urine in people living around recycling or chemical waste facilities</td>
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<td></td>
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<td>Incidence of congenital defects desagregated by type of defect</td>
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<td>Levels of occupational lead (by sex, age, and type of occupation)</td>
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<td>Levels of lead in children under 5 years, pregnant women (by prenatal test) and in the umbilical cord</td>
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<td>Incidence of cancer (cause and type related with the environment)</td>
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</table>
## APPENDIX 2
Table A. Indicators held after its initial analysis and evaluation by participants in Tijuana, B.C. workshop the days of August 13-15 2003. First score and revision round.

<table>
<thead>
<tr>
<th>OBJECTIVE 3A: IDENTIFY GROUPS FOR PRIORITY INTERVENTION (VULNERABLE)</th>
<th>WATER</th>
<th>AIR</th>
<th>FOOD</th>
<th>WASTES</th>
<th>MULTIPLE EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality rate in children under 5 years (OPS)</td>
<td>Percentage of population under the international poverty line</td>
<td>Population access to health services</td>
<td>Weight at birth</td>
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<tr>
<td>OBJECTIVE 3B. IDENTIFY GROUPS FOR PRIORITY INTERVENTION (ELEVATED EXPOSURE)</td>
<td>Percentage of children living in areas where the public service has exceeded applicable drinking water standards or has violated treatment standards</td>
<td>Percent of households with smokers</td>
<td>Percentage of children whose diet contains high levels of contaminants in their food</td>
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<td>Total of children living in households with inadequate storage of chemical substances</td>
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<tr>
<td>Percentage of children exposed to tobacco in households with smokers</td>
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<td>OBJECTIVE 4</td>
<td>REDUCE DISEASE EXPOSURE BY:</td>
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<tr>
<td>Support for information on adaptation</td>
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<td>Protection and control steps (in the industry, community, state wide)</td>
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<tr>
<td>Prevention and correction steps (in the industry, community, state wide)</td>
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<tr>
<td>Promote adaptation behavior and institutional answers</td>
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<tr>
<td>Percentage of population with drinking water attaining the quality standards of their country</td>
<td>Program implementation of vehicle inspections for air emissions</td>
<td>Numbers of trainings or trained staff in the handling and manufacturing of food and contamination prevention</td>
<td>Volumes of infectious biological hazardous wastes that were adequately disposed</td>
<td>Number of sister cities with contingency plans which fulfill minimum requirements</td>
<td></td>
</tr>
<tr>
<td>Jurisdictions with laws related to interior air - smoke free air</td>
<td>Notice of contaminated food</td>
<td>Identification or standards for handling of waste confinement and by type of confinement</td>
<td>Annual number of public health agency staff who receive training on process of environmental impact assessment</td>
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<tr>
<td>Cities with contingency plans for marine biotoxins</td>
<td></td>
<td></td>
<td>Collection centers for used tires maintaining basic requirements of proper storage, vector control and fire prevention</td>
<td>Number of cities with permanent programs about environmental and health risks</td>
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<td></td>
<td></td>
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<td></td>
<td>Number or percentage of active binational committees working on environmental impact</td>
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</tbody>
</table>
APPENDIX 3

Criteria for ranking indicators on the preliminary list:

Catalyst for action in public health programs in the Border XXI initiative

3- if the associated impact or its consequences could lead directly or quickly to death;
2- if the associated impact is potentially serious and/or affects a broad sector of the population;
1- if the associated impact could be reversible or benign.

Impact on active and administrative in public health and environment

3- if the burden produced by the disease is high and the level of attributable risk is high;
2- if these are moderate;
1- if these are low.

Impact on politicians and needs and concerns of the public

3- if public opinion views the issue as very important;
2- if it is seen as somewhat important;
1- if it is not likely to be seen as important.

Criteria applied to rank basic indicators retained in Group 1 (after review in the first round):

Feasibility and facility with which data could be collected and collaged for the U.S.-Mexico border region

3- if they had already been collected;
2- if significant improvement is required for collection, or if a special survey is required;
1- if laboratory data and/or specific epidemiological research are also required.

Ease of implementation over time

3- possibility of implementation in the short term;
2- possibility of implementation in the medium term (2-3 years);
1- requires implementation in the long term (more than 3 years).

Synergy and complementary interaction with the Border XXI program and/or other border initiatives and national/federal surveillance systems

3- if it strongly supports accomplishing three or more goals;
2- if it helps to accomplish one or two goals;
1- other.
## Health Indicators for the U.S Mexico Border

**Location:** Tijuana, Baja California  
**Date:** August 13-15, 2003

### Participants

<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>City</th>
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<th>Confirmed participants</th>
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<td>MX</td>
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<td>Arizona Health Dept.</td>
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APPENDIX 5 - LIST OF ABBREVIATIONS

MEXICO:


BID -Banco Interamericano de Desarrollo - http://www.iadb.org/;
http://www.iadb.org/exr/ESPAÑOL/index-espanol.htm;

COMAPA: Comisión Municipal de Agua Potable y Alcantarillado

CILA: Comisión Internacional de Límites y Aguas

DGSA/SSA – Dirección General de Salud Ambiental – Secretaría de Salud de México
http://www.salud.gob.mx/unidades/drgsa/index.htm;

DGE/SSA – Dirección General de Epidemiología – Secretaría de Salud de México
http://www.epi.org.mx/;

DIF–Sistema Nacional para el Desarrollo Integral de la Familia - http://www.dif.gob.mx/;

PROFEPA- Procuraduría Federal de Protección del Medio Ambiente –
http://www.profepa.gob.mx


IMSS –Instituto Mexicano del Seguro Social - http://www.imss.gob.mx

ISSSTE – Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado –
http://www.issste.gob.mx;


SEDESOL FEDERAL -Secretaria de Desarrollo Social – http://www.sedesol.gob.mx/;

SECOFI – Secretaría de Comercio y Fomento Industrial –

SUIVE -Sistema Único de Información y Vigilancia Epidemiológica -
http://www.salud.gob.mx/index.html;

SISPA -Sistema de Información Básica en Salud para población abierta -
http://www.salud.gob.mx/index.html;

SISVEA - Sistema de Vigilancia Epidemiológica de las Adicciones - http://www.salud.gob.mx/index.html;


UNITED STATES:


CDC: Center for Disease Control and Prevention – http://www.cdc.gov
   EEHS: Emergency and Environmental Health Services - http://www.cdc.gov/nceh/globalhealth/GHAR/divisions/eehs.htm;
   EHSB: Environmental Health Services Branch - http://www.cdc.gov/nceh/ehs/default.htm;
   EHLSS: Environmental Health Laboratory Sciences - http://www.cdc.gov/nceh/dls/programs.htm;
   APRPHE: Air Pollution and Respiratory Health Branch - http://www.cdc.gov/nceh/airpollution/;
   HSB: Health Studies Branch - http://www.cdc.gov/nceh/hsb/;
   NCEH: National Center for Environmental Health - http://www.cdc.gov/nceh/indicators/acronyms.htm;
   NIOSH – National Institute for Occupational Safety and Health - http://www.cdc.gov/niosh/homepage.html;

CB: Census Bureau http://www.census.gov/


EPA: Environmental Protection Agency – http://www.epa.gov
   AIR NOW: http://www.epa.gov/airnow/
   Information clearinghouse: http://www.epa.gov/iaq/iqinfo.html
   OAR: Office of Air and Radiation – http://www.epa.gov/oar/
   OAQPS: Office of Air Quality and Performance Standards -
   OPP: Office of Pesticides Programs – http://www.epa.gov/pesticides/

FDA: Food and Drug Administration - http://www.fda.gov/


PAHO – Pan American Health Organization


USDA: United States Department of Agriculture

TNRCC Texas Natural Resource Conservation Commission

TCEQ: Texas Commission on Environmental Quality – http://www.tceq.us

TDH: Texas Department of Health – http://www.tdh.us