Building Occupational Hygiene Capacity in Developing Nations

NIOSH Activities 1997 - 2005

AlHCe
May, 2005

Aaron Sussell* and Marilyn Fingerhut

National Institute for Occupational Safety and Health
*Cincinnati, Ohio, and Washington, D.C
A NIOSH Strategic Goal:

Enhance global workplace safety and health through international collaborations
Magnitude of Global OH Problem

- More than 2.9 billion workers worldwide
  - Includes 170 million children ages 5-17 in hazardous work

- About 2 million fatalities from work-related diseases and injuries each year
  - Tip of the iceberg – another 160 million nonfatal diseases, 270 million nonfatal injuries annually

- Only 10-15 % of global workforce has access to occupational health services

- 4% global gross domestic product lost

ILO, Global estimates of fatalities, 2002
ILO, A future without child labour, 2002
Common Challenges

- Health resources are primarily directed at infectious diseases, nutrition, & environment
- Government support for training of OH professionals lacking
- Low-skill labor + high unemployment + poverty = “disposable worker”
- Little political ability to address OH hazards in domestic companies and the informal sector
NIOSH International Collaborators

- WHO Global Occupational Health Network
  - 64 collaborating centers worldwide
  - 3 NGOs ICOH, IEA, IOHA (includes AIHA, ACGIH®)
  - CC Global Work Plan has 15 priority areas, 350 projects
    http://www.who.int/occupational_health

- ILO
- Pan American Health Organization (Americas region)
- Government agencies
- Companies and unions in other countries
- National occupational hygiene associations
- CDC Office of Global Health and other CDC Centers
- International organizations (ICOH, IOHA, IEA, IARC, ISO)
- Individual researchers in many countries
Support for advanced training of OH/EH professionals – Fogarty program

- NIOSH is an enthusiastic founder; NIOSH, the NIH Fogarty International Center, and NIEHS provide funds
  - provides 5-year competitive grants to U.S. universities to work with universities in developing nations for research and professional training

- **Mission:** Graduate training of health scientists, industrial hygienists, engineers, clinicians, chemists, and allied health workers (in about 30 countries)

- Graduates have interned at NIOSH (South Africa)
- NIOSH can provide in-country technical assistance when requested by Fogarty grantee (Zambia, 2006)
Building Occupational Hygiene Capacity

- Some examples that will be shown here*

- Mexico
- Venezuela
- Sao Paulo Mtg.
- Philippines
- Central America
- El Salvador

*Selected from projects the presenter was involved in, 1997 - 2005. There were other NIOSH international projects and assignments during this period.
A specific issue for industrial hygiene:
The “glass case syndrome”

- IH equipment is donated to a government,
- “A little bit of everything,”
- Inadequate training /mentoring of personnel as follow-up,
- No budget for sample media, calibration, supplies or maintenance costs,
- Adequate laboratory capacity lacking

- **Result:** Unused IH equipment is displayed in a glass case…
Mexico

- Collaboration with PAHO. NIOSH assigned two physicians to PAHO/Mexico 1995-97, and 1997-99
- An IH was sent (2 mo.) to assess OH capacity and present short courses to allied professionals. Partners: PAHO, IMSS, INSP

- *How to evaluate OSH problems* (12 hours) – for Assoc Occ Physicians, in maquiladoras, with UCLA Fogarty program.
- *Basic industrial hygiene* (40 hrs), primarily for federal government staff
Activities continued:
- Observed federal gov’t workplace inspections and evaluations
- Assisted a graduate student (tox) in a study of fireworks makers
- Presented 24-hr course to federal gov’t (IMSS) how to conduct OH investigations
- A number of other short courses were presented by other NIOSH staff
- **Collaborator / organizer:** Center for InterAmerican Social Security Studies (CIESS), based in Mexico (1998)
  - Instructor in a 32-hour basic occupational hygiene course for private sector allied professionals (engineers and physicians)
  - Classroom lectures, exercises, and walk through survey of Al smelter
Sao Paulo Mtg. on Development of Occup. Hygiene in Latin American and the Caribbean

- Organized by WHO/PAHO; hosted by FUNDACENTRO (1998)
- With IOHA, AIHA, ACGIH, and national associations ABHO, AMHI, AVHO; also NIOSH and MTAS/Spain

- Representatives (gov’t, industry, academia, labor) from 16 countries met for 3 days to discuss development of OH in the region, and specifically human resources

- **Product:** La higiene ocupacional en América Latina: Una guía para su desarrollo

- [http://www.who.int/occupational_health/publications/](http://www.who.int/occupational_health/publications/)
Philippines

- Collaboration with ILO South-East Asia, a Harvard graduate student, and DOLE, Philippines (1998)

- Activities: Basic Industrial Hygiene Sampling for DOLE Regional Labor Inspectors (40 hrs)
  - Designed to address the “glass case syndrome”
  - Classroom, hands-on practice, field surveys, training manual, instructor’s guide
Iron foundry: heat stress, metal fumes, CO, noise, illumination. Safety hazards

Printing plant: noise, heat stress; solvents
Central America

  - NIOSH prepared “Equipment Data Sheets for Industrial Hygiene” – for the IH equipment each country had
  - Short courses for reps from 8 countries on how to calibrate and use sampling devices, at CERSSO Facilitators meetings in Dominican Republic and El Salvador
Section 1: Description of Equipment
Combustible Gas Indicator

Section 2: Using the Equipment

2.a. What does this equipment do?
The instrument operates by the catalytic action of a heated platinum filament in contact with combustible gases or vapors in air. Combustible gas concentrations up to 100% of lower explosive limit (LEL) are measured directly on the meter. Concentrations in the explosive range are indicated by full-scale deflection of the meter pointer. By use of a dilution tube, concentrations above LEL are diluted with air in a ratio selected so that the diluted mixture is measured on the instrument scale; then, the actual gas concentration can be easily calculated.

2.b. When should I take an air sampling pump with me on an inspection?
There are four Explosimeter models; each model is well suited for use by public utilities, municipalities, mining and marine services. And, each model is excellent for testing confined
El Salvador

  - Assisted MSPAS conduct an investigation of community and occupational exposures to Pb, in response to reported health effects in 2 communities.
  - Training in lab and IH methods for Pb
Lessons learned - conclusions

- Technical assistance to developing nations benefits the U.S. as “scientific diplomacy”

- Building governmental OH capacity gives countries tools to “raise the floor” for working conditions in their domestic industries/sectors

- Long-term partnerships are better than short ones (but are more costly)

- Short courses focused on one or two immediate priority needs are more effective than “overview” courses

- The best way to assess and verify the effectiveness of training/interaction is to observe counterparts put the training into practice
Thank you!

Acknowledgements

The authors gratefully acknowledge Sherry Baron, Melody Kawamoto, Kevin Ashley, Manuel Rodriguez (NIOSH), Martiza Tennasee & Berenice Goelzer (PAHO), Paul Olson (3M & AIHA), Rodolfo Arias (CIESS & ACGIH), Bill Salter (ILO/SEAPAT), Rafael Amador (CERRSO), Juan Rodríguez (Analisis Ambiental, AMHI, AIHA), Richard Rinehart (ILO consultant, ACGIH), Gloria Suarez and Victor Caceres (CDC OGH) for their invaluable collaboration and assistance in conceiving of, planning, and executing the activities described in this report. Without their vision and commitment, it would have been just some long plane rides.

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of NIOSH. Mention of company names or products does not constitute endorsement by NIOSH.