3rd Internacional Workshop Advances in Cleaner Production
“Cleaner Production Initiatives and Challenge for a Sustainable World”

Sustainability practices performed at the Mexican Maquiladora Industry: A case study in the state of Sonora and Baja California, Mexico.

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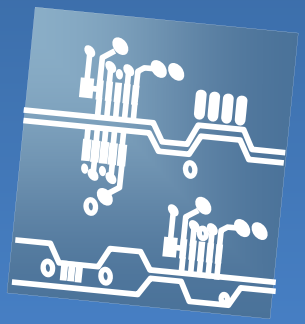
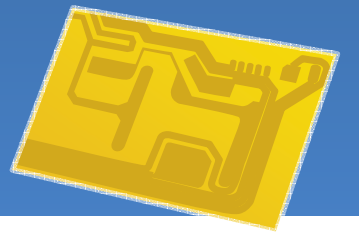
Maquiladora Profile

- By definition, maquiladora used to be any manufacturing plant that imports and assembles duty-free components for export.



Maquiladora Profile

- In Mexico, Maquiladoras are grouped by INEGI (National Institute of Statistics, Geography and Informatics) into the following categories: Assembly of Food Products, Assembly and Repair (excluding Electronic Equipment), Leather, Shoes and Products,



Maquiladora Profile

- Electrical and Electronic Accessories; Garment Assembly and Textile Products; Construction and Transportation Equipment; Assembly of Machinery, Equipment, including Electronic Equipment; Assembly of Furniture and Related Products; Service Establishments; Chemical Products; Assembly of Toys and Sporting Goods; and Other Manufacturing.

Maquiladora Profile

- Maquiladoras arrived in Mexico, almost five decades ago, as a way to propel economic development and alleviate the unemployment problems. In the course of its development, maquiladoras have created jobs opportunities, but they also brought all kinds of risks.

Maquiladora Profile

- Occupational Health and Safety

There are many factors such as gender, physical, chemical, ergonomic, biological and psychosocial risks that can affect the health and safety of the workers.

Geographic Area

Objective of the Research

- This research was aimed at identifying the diverging pollution prevention and occupational and safety practices undertaken by the management of the maquiladoras, in order to be able in generating meaningful insights for facilitating the adoption of sustainable production system.

Sustainable Production

- The term “sustainable production” is used to define systems of production that integrate concerns for long-term viability of the environment, worker health and safety, the community, and the economic life of a particular firm.

Quinn M, Kriebel, D. et al (1998) “sustaible production: a proposed strategy for the work environment, American Journal of Industrial Medicina 34: 297-304.

CURRENT MAQUILADORA PRODUCTION SYSTEM

♦SEMARNAT,
♦Ministry of Labor
♦Others.

Worker's Union

Block 1

Transnational Corporation

Design:

• Process

•Product

Selection of raw material

•Organization

Block 2

Air Emissions

Maquiladora

•Assembly
•Environmental and I.H controls

Residues

Liquid

Solid

Block 3

Transnational Corporation/Foreign Market Part or Final Product

Final Disposal

•???? ????? ??

NGO s

Community groups

Estados Unidos/or country

Hermosillo, Sonora, México

Methodology

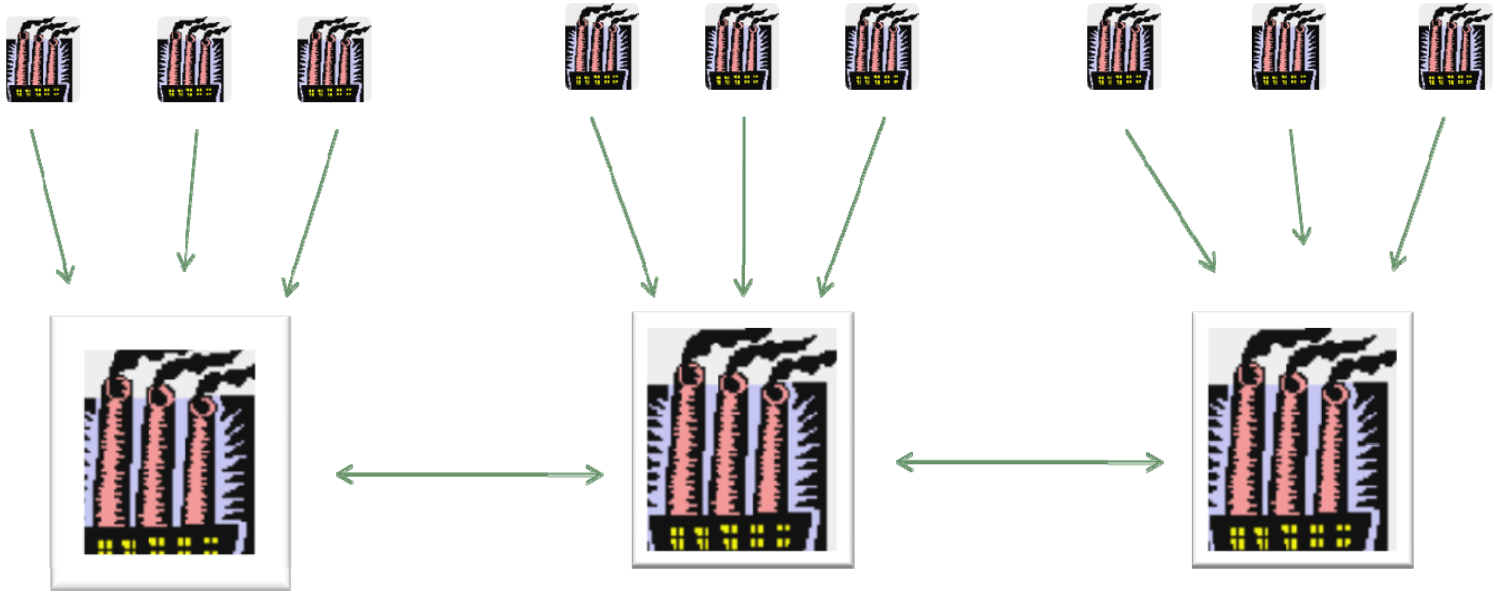
- Scope

  ✓ This research was conducted from September 2009 though July 2010.

  ✓ All maquiladoras in the reserch were from the electronic branch.

Methodology

CASE- STUDY



Methodology

- Instruments

  - ✓The OSHA's Program Evaluation Profile (PEP)
  - ✓Cleaner Production and pollution prevention survey
  - ✓Workers survey
  - ✓On site visits

The OSHA´s Program Evaluation Profile (PEP)

✓ The questionnaire evaluates 25 indicators divided in four

categories:

Management leadership and employee participation,
Workplace analysis,
Hazard prevention and control,
Safety and health training.

Each indicator could be scored from 0 to 4.
As a result, 100 is the maximum possible score.

OSHA PEP

Categories	Max . Score	Values	Interpretation
management leadership and employee participation,	36	0	No score “0” is awarded where little or no evidence of positive effort can be found.
workplace analysis	28	1	Basic or minimal compliance generally yields “1”.
hazard prevention control	24	2	some positive changes and/or behavior are generally apparent.
safety and health training	12	3	suggests most people are aware of and adhere to the expectations spelled out by that indicator.
		4	is the region of excellence that suggests the workplace culture is fully supportive of safety and health as a fundamental value.

RESULTS OSHA PEP

City	Management Leadership	Workplace Analysis	Hazard Prevention Control	Safety and Training	Final Score
Hermosillo	13	11	13	2	39
Maximun Score	36	28	24	12	100
%	36	39	54	17	**39**
Nogales	22	21	17	5	65
Maximum Score	36	28	24	12	100
%	61	75	71	42	**65**
Mexicali	21	19	18	6	64
Maximum Score	36	28	24	12	100
%	58	68	75	50	**64**

RESULTS CP and PP Survey Mexicali

Scale /Maquiladora	***Maquiladora (1)***	***Maquiladora (2)***	**Maquiladora (3)**
Regulations	yes	yes	yes
Balance of energy	yes	No	No
D f E	No	No	No
TUR	No	No	No No
LCA	No	No	No
ISO 9000	yes	yes	yes
ISO 14000	No	No	No
Air Quality outside	yes	yes	yes
Water use	Industrial	Industrial	Domestic

RESULTS CP and PP Survey Mexicali

Waste generated	Scrap(plástico), alcohol, thinner, oil, flux, silicón, swelding, sólid (estopas contaminadas)	welding, Tricloroetileno, flux, resinas.	Sólidos saturados, solvents, resina, alcohol isopropilico, welding, empty
	residual oil, degreeser		containers
Amount of waste	Solid waste 1.16 Ton/mo. Liquid waste	Solid waste 168 kg/mo. Liquid waste 158	Solid waste 225 kg/mo. liquid waste 11976
	1.16 Ton/mo.	lts/mo.	lts/mo.
Waste management	SAMEX	PICSA	RIMSA
Awarded	No	No	No

RESULTS CP and PP Survey Hermosillo

Scala/ Maquiladora	***Maquiladora* (4)**	***Maquiladora* (5)**	**Maquiladora (6)**
Regulations	yes	yes	yes
Materia and energy balance	No	No	No
D f E	No	No	No
TUR	No	No	No
LCA	No	No	No
ISO 9000	yes	yes	yes
ISO 14000	No	No	No
Air quality outside	yes	No	No
Water use	Industrial	Domestic	Domestic

RESULTS CP and PP Survey Hermosillo

Waste generate	Scrap(plástico), alcohol, thinner, aceite, flux, silicón, soldadura, sólidos (estopas contaminadas) aceite residual, desengrasante	Estopas saturadas, Recipientes de químicos vacios, aceites, flux, resinas.	Sólidos saturados, aceite residual, resina, catalizadores, estopas con solventes, soldadura, recipientes vacios
Amount of waste	Solid waste 50 kg/mo Liquid waste 400 lts/mo.	Solid waste 164 kg/mo. Liquid wastes 134 lts/mo.	Solid waste 325 kg/mes liquid waste 1800 lts/mo.
Waste management	RIMSA	RIMSA	RIMSA
Awards	Clean industry (PROFEPA)	No	No

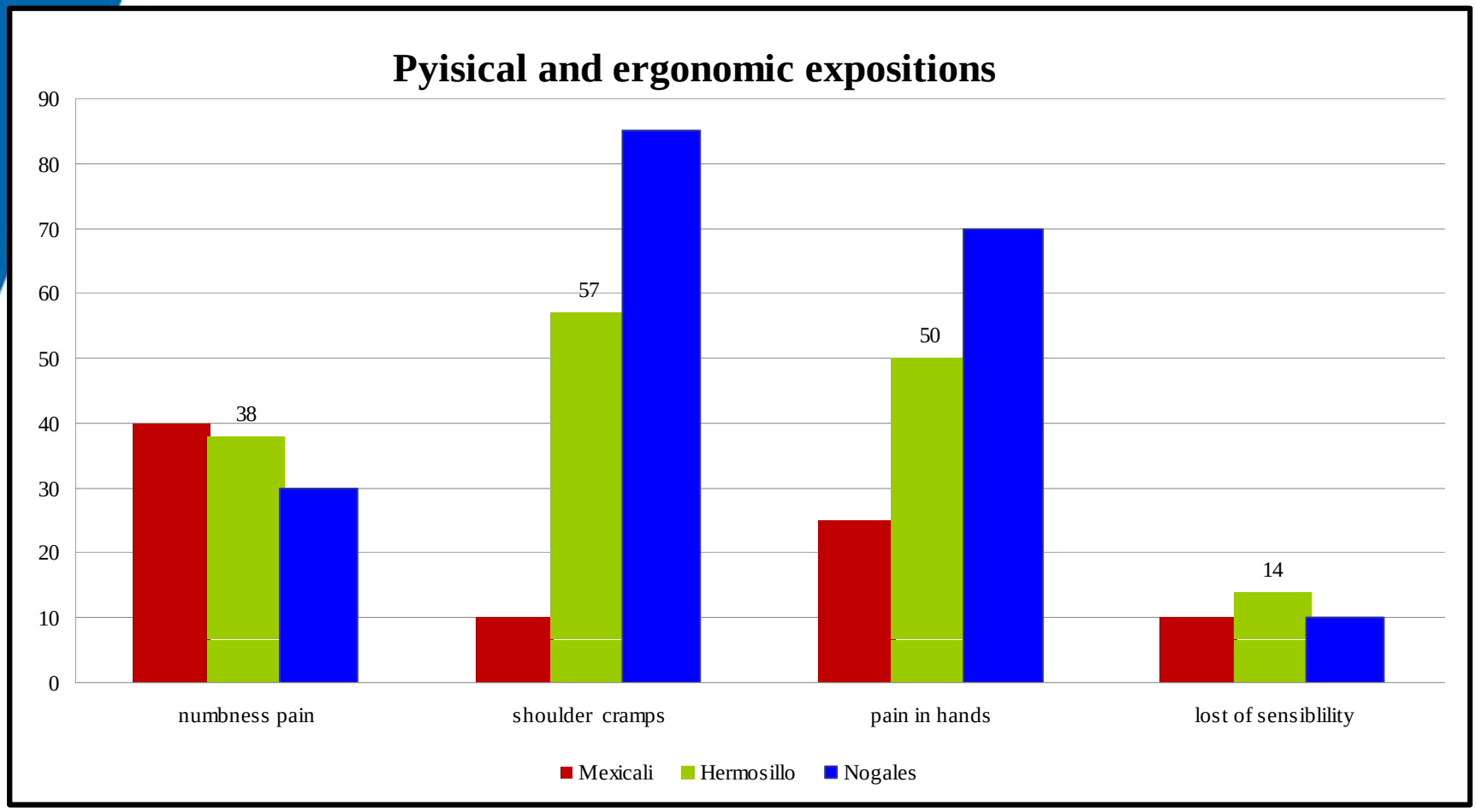
RESULTS CP and PP Survey Nogales

scala/ Maquiladora	***Maquiladora* (7)**	***Maquiladora* (8)**	**Maquiladora (9)**
Regulations	yes	yes	yes
Material and energy balance	No	No	No
D f E	No	No	No
TUR	No	No	Yes
LCA	No	No	No
ISO 9000	yes	yes	ISO9002 QS
ISO 14000	No	No	ISO 14001
Air quality outside	yes	No	Yes
Water use	Domestic	Doméstic	Doméstic

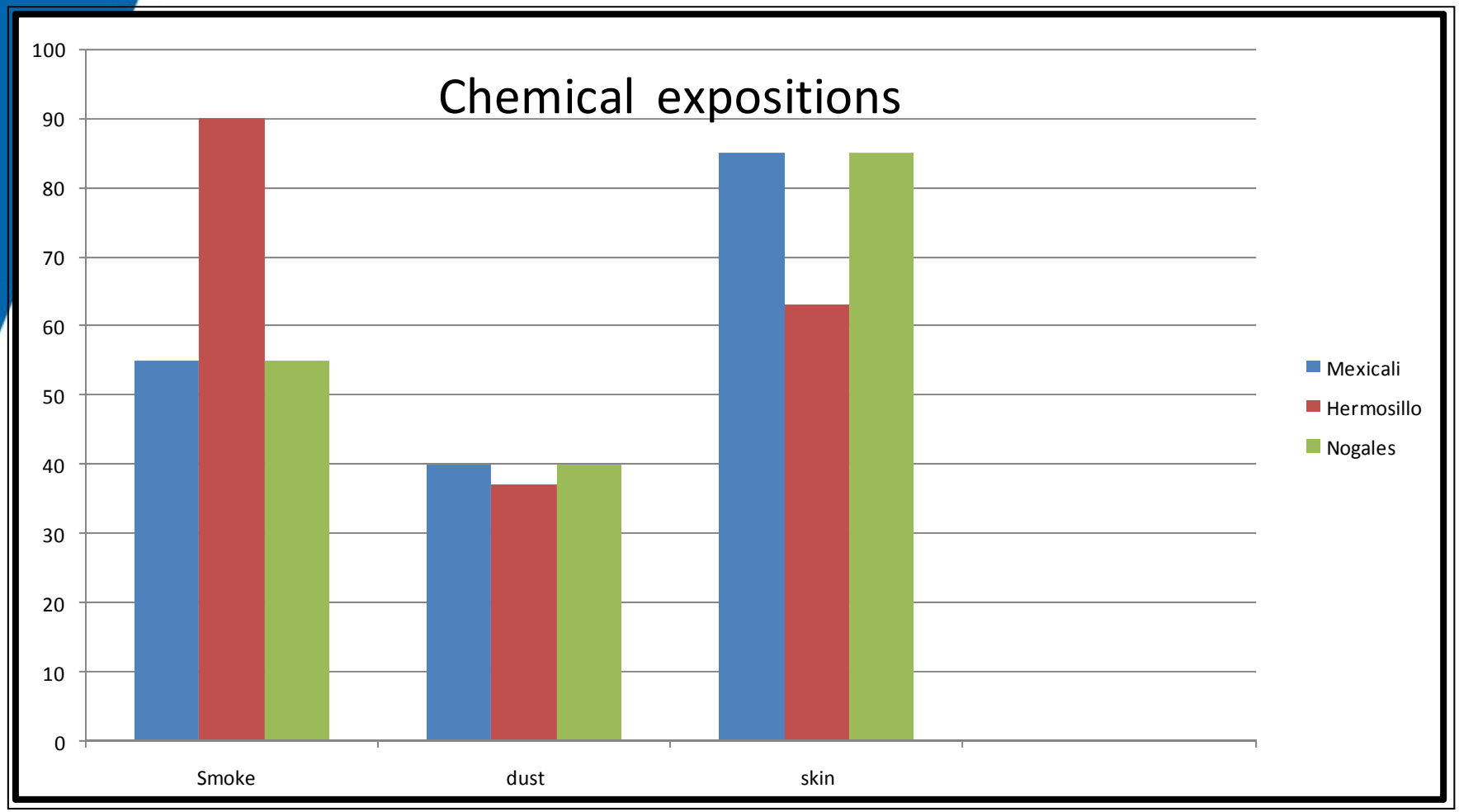
RESULTS CP and PP Survey Nogales

Waste generated	Sólid (pegamento, pasta), estopas Líquid (alcohol), flux	Sólidos saturados, recipientes vacios, residual oil, contaminated solvents	Saturated solid , franelas, material with oil) Líquids inflamables (desengrasantes) Empty contamines, oil.
Amount of waste	Sólid 10 kg/mo. liquid50 lts/mo.	Sólid 48 kg/mo. Sustancias liquidas 10 lts/mo.	Sólid 387 kg/mo. liquids 1200 lts/mo.
Waste management	ROMIC	RIMSA	RIMSA
Awarned	No	No	The “AMIGO” Award by the Arizona Department of Environmental Quality.

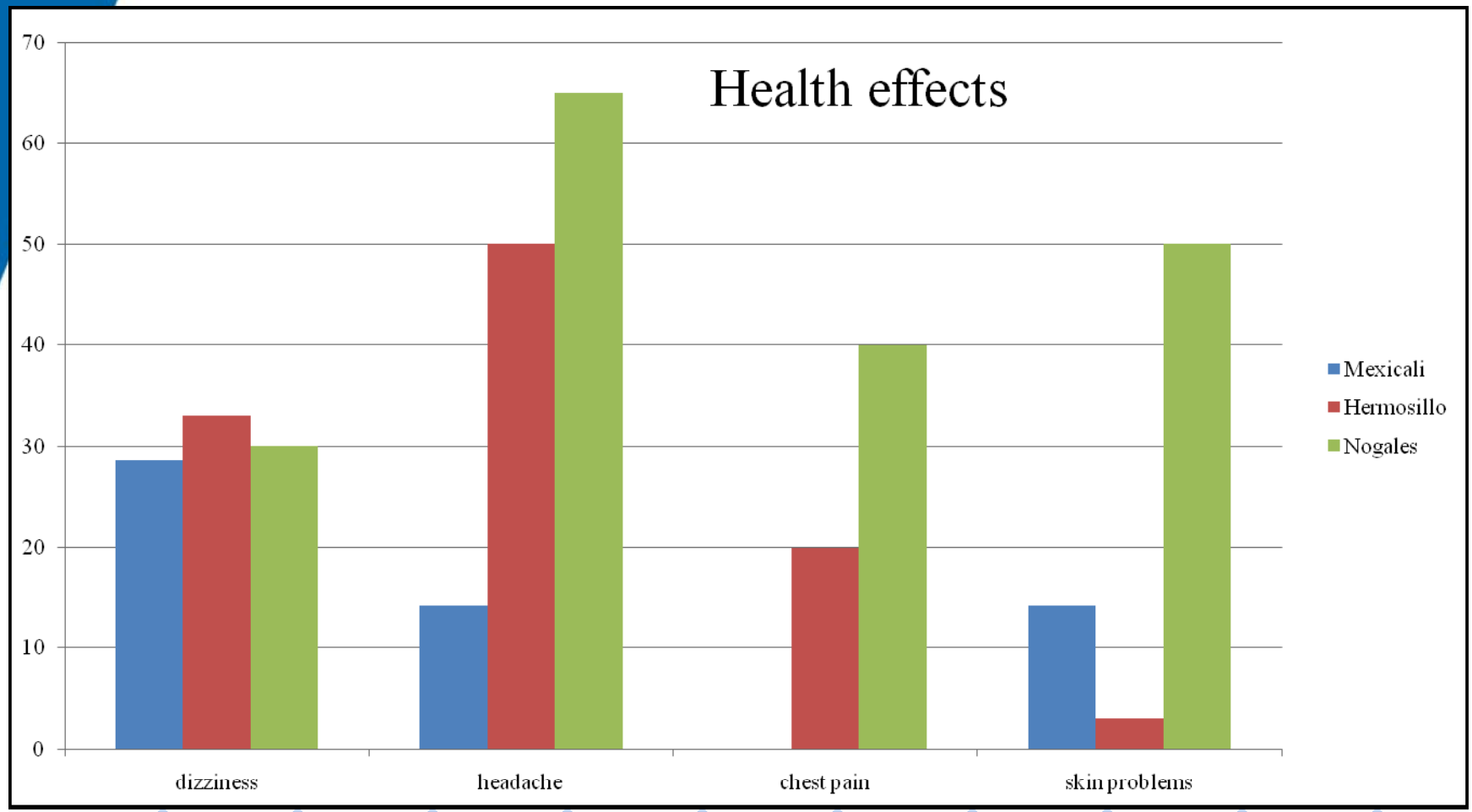
RESULTS WORKERS SURVEY



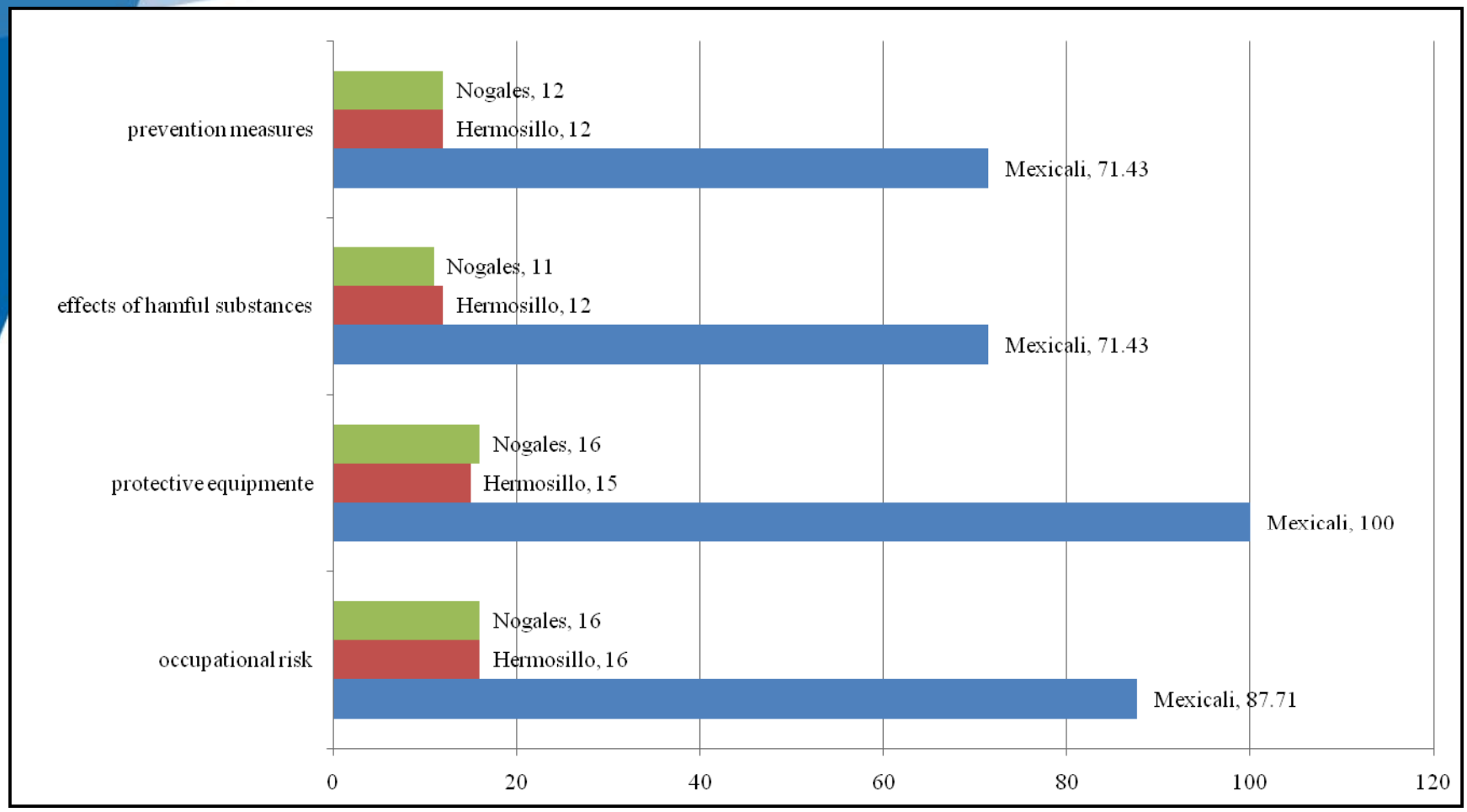
RESULTS WORKERS SURVEY



RESULTS WORKERS SURVEY



RESULTS WORKERS SURVEY



HEALTH AND SAFETY TRAINING

CONCLUSION

✓ Environmental and labor regulations focus on end-of-pipe approaches. Maquiladoras have built systems to deal more with the pollution than with pollution prevention.

✓unions do not participate in organizational or technological changes for fostering sustainability practices.

CONCLUSION

- ✓Corporations, Mexican government, workers, unions and society may assume their proper roles.
- ✓the workers, what is needed is a better training with more focus on areas related to occupational health and safety and health and handling of chemicals.

CONCLUSION

- ✓ The maquiladora´s production system has been represented in this research as a series of decisions made by foreign manufacturers where the Mexican environmental and health and safety coordinators and workers are not participating in matters.

CONCLUSION

- The implementation of a sustainable production system in the maquiladora industry will require that the manufacturers who are involved in design of their products assume the responsibility of the negative effects of their products along its life cycle.


Thank you……