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# Introduction Presentation

**Adnan Hyder, MD, PhD**

**Maria Segui-Gomez, MD, ScD**

**Bloomberg School of Public Health**

# Lecture Topics

- ◆ Course orientation
- ◆ Introduction and review of injury prevention
- ◆ Global burden of injuries
- ◆ Injury prevention programs around the world



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# Section A

## *Course Orientation*

# Controlling the Burden of Injuries—A Global Perspective

- ◆ Objectives
- ◆ Welcome and introductions
- ◆ Course structure and grading policy

# Objectives

- ◆ In this course, you will learn three skills needed to reduce the burden of injuries:
  - Methods used to understand the magnitude and determinants of injuries
  - Magnitude of the problem in different countries around the world
  - Interventions—current and potential—to reduce the burden of injuries



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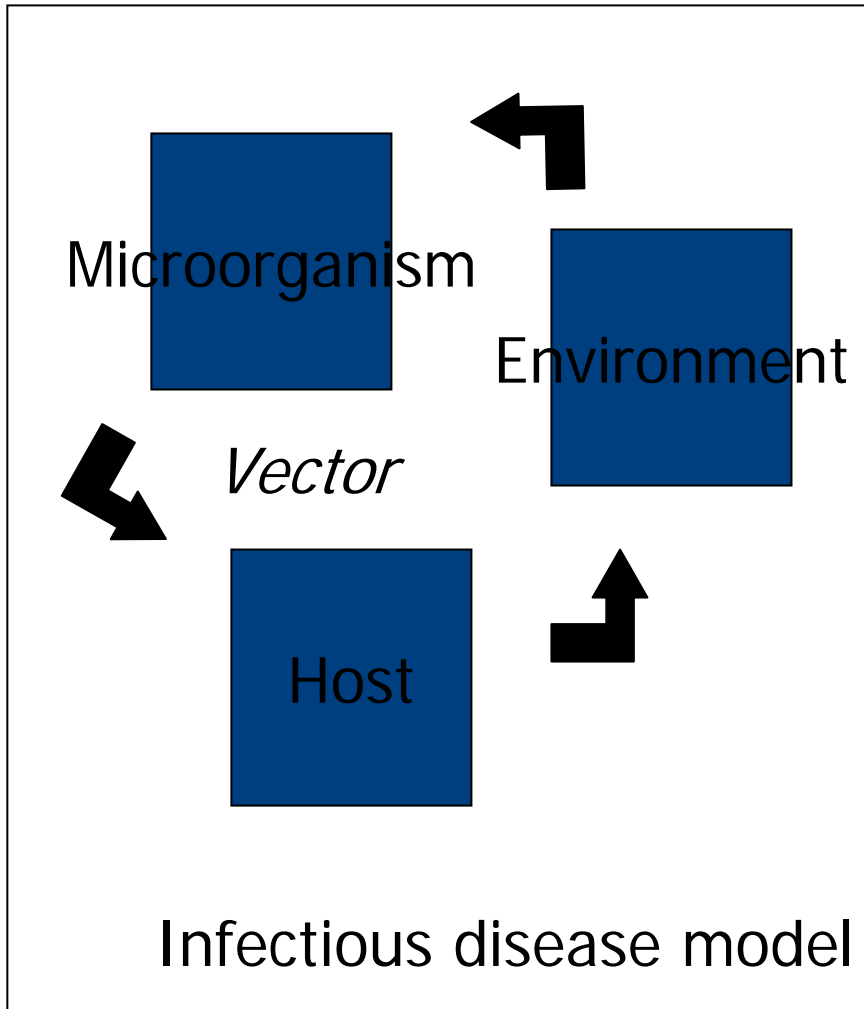
## **Section B**

### ***Introduction***

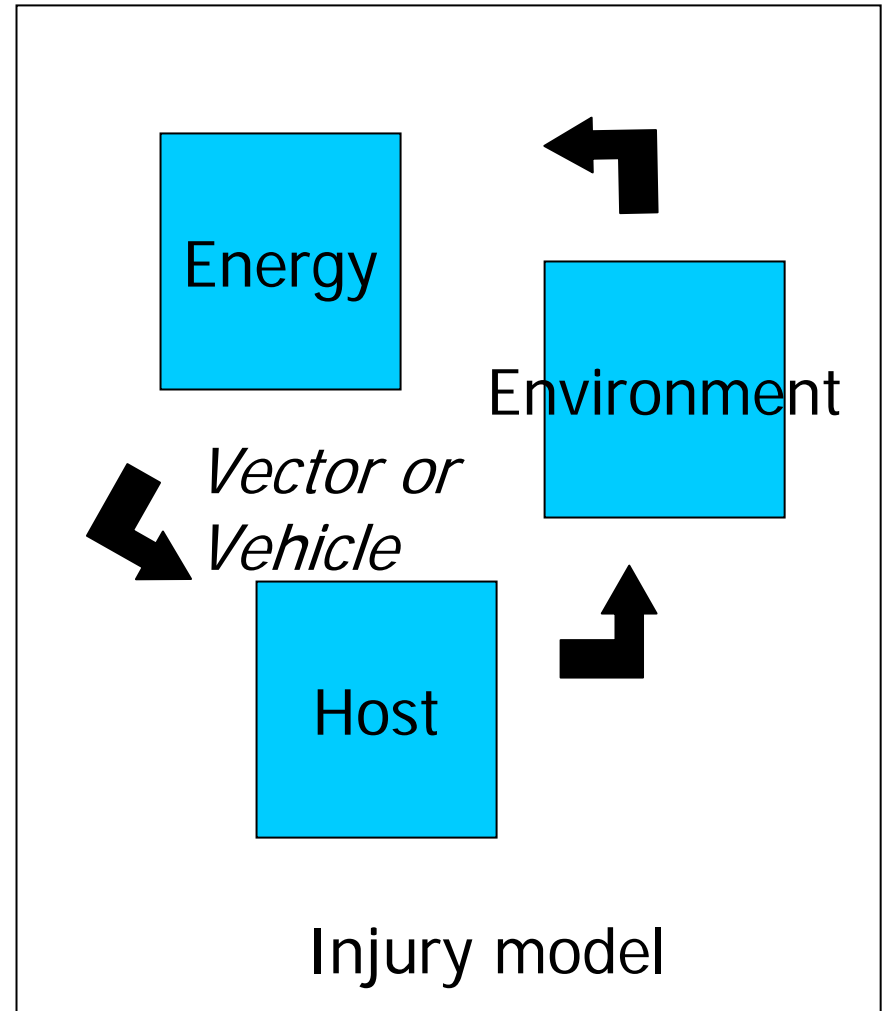
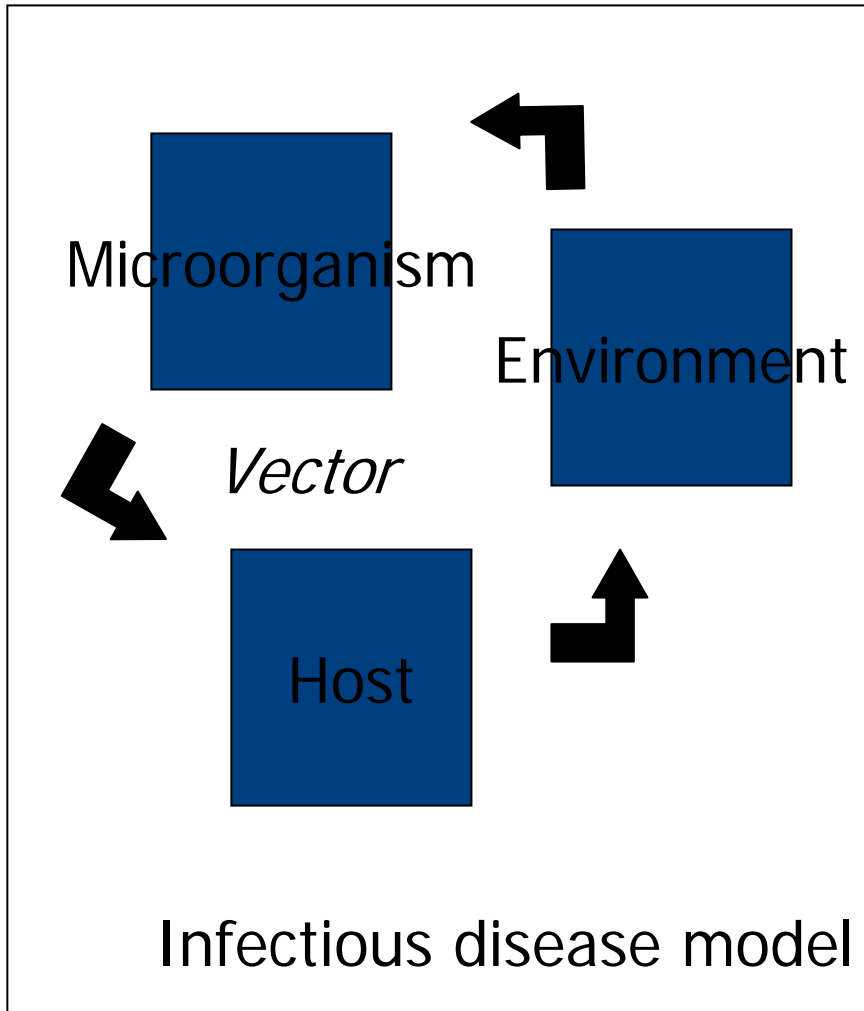
# Injuries

- ◆ Body damage resulting from acute exposure to excess energy (whether thermal, mechanical, electrical, or chemical) or from the absence of such essentials as heat or oxygen

# Why?



# Why?



# How to Describe Them

- ◆ Etiology: Inappropriate energy transfer
- ◆ Vehicles or vectors: Motor vehicles, bullets, animals, etc . . .
- ◆ Pathology: Fractures, dislocations, sprains, strains, concussions, etc . . .
- ◆ Treatment: Outpatient, hospitalization, etc . . .
- ◆ Prognosis: Recovery, sequelae, death

# Common Classifications

## Themselves

- ◆ Nature of injury (e.g., fracture, laceration, contusion)
- ◆ Body region affected (e.g., head, chest, abdomen)
- ◆ Severity (e.g., fatal, non-fatal)

## Mechanism of Injury

- ◆ Mechanism (e.g., blunt, penetrating, burn)

## The Hazard that Caused Them

- ◆ Cause (e.g., motor-vehicle, falls, drowning)
- ◆ Type of activity (e.g., work, sport, recreational)
- ◆ Product involved (e.g., firearm, snowmobile)
- ◆ Location of activity (e.g., school, outdoors, home)
- ◆ Intent (intentional, unintentional)

# Those Classifications

- ◆ Are exhaustive and may be exclusive within classification
- ◆ But we have been using selected categories within classifications and created a non-exclusive, non-exhaustive system
- ◆ This has led to developing a fragmented and incomplete system

# Why Are Injuries Relevant at All?

## *Individual and Societal Consequences*

- ◆ Mortality (death)
- ◆ Morbidity (non-fatal injuries)
- ◆ Disability (short- and long-term sequelae)
- ◆ Cost

# History of the Field

- ◆ De Haven (1942): Survivability of events
  - Stapp (1955): Energy tolerance
- ◆ Gordon (1949): Application of epidemiological framework
- ◆ Gibson (1961): Energy as source of injury
- ◆ Haddon (1970): Preventability strategies—matrix and principles
  - Nader (1965): Consumer protection
  - Baker (since late 60s): Public health leadership in measuring the burden of injury

# Lessons Learned

- ◆ Severity of injuries depends on:
  - Energy being dissipated
  - Shapes of the colliding objects
  - Rigidity of colliding objects
  - Tolerance of host
- ◆ Injuries are predictable
  - Epidemiology, risk factors

# Lessons Learned

- ◆ Injuries are preventable
  - Primary, secondary, and tertiary prevention
  - Individual, vector, environment-level interventions

# The Haddon Matrix

	Host	Vector	Environment	
	(Human)	(Vehicle)	Physical	Socio-economic
Pre-event				
Event				
Post-event				

# Key Cultural Traditions

- ◆ Accidents vs. injuries
  - “Accidents happen” vs. injuries are not accidents
- ◆ Passive vs. active primary prevention interventions
- ◆ Individual vs. environment



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## Section C

### *Burden of Injuries*

# Leading Causes of Global Mortality, 2001

<b>Disease or Injury</b>	<b>Thousands (Deaths)</b>
◆ Ischemic heart diseases	◆ 6,880
◆ Cerebrovascular disease	◆ 5,096
◆ Lower respiratory infections	◆ 3,863
◆ HIV/AIDS	◆ 2,943
◆ COPD	◆ 2,520
◆ Perinatal conditions	◆ 2,438
◆ Diarrheal disease	◆ 2,124

# Leading Causes of Global Mortality, 2001

<b>Disease or Injury</b>	<b>Thousands (Deaths)</b>
◆ TB	◆ 1,660
◆ Road traffic accidents	◆ 12,59
◆ Trachea bronchus and lung cancer	◆ 1,210
◆ Malaria	◆ 1,080
◆ Hypertensive heart disease	◆ 939
◆ Self inflicted injuries	◆ 814
◆ Diabetes Mellitus	◆ 808

# Global Burden of Disease 2000

## *Causes of Death*

<i>Causes</i>	<i>Death (*10<sup>6</sup>)</i>	<i>%</i>
Group 1	12	24
Group 2	33	66
Group 3	5	10

# A Central Question

- ◆ Do injury patterns differ around the world?

# Comparison of death rates/ 100,000 by various mechanisms in WHO regions 2000

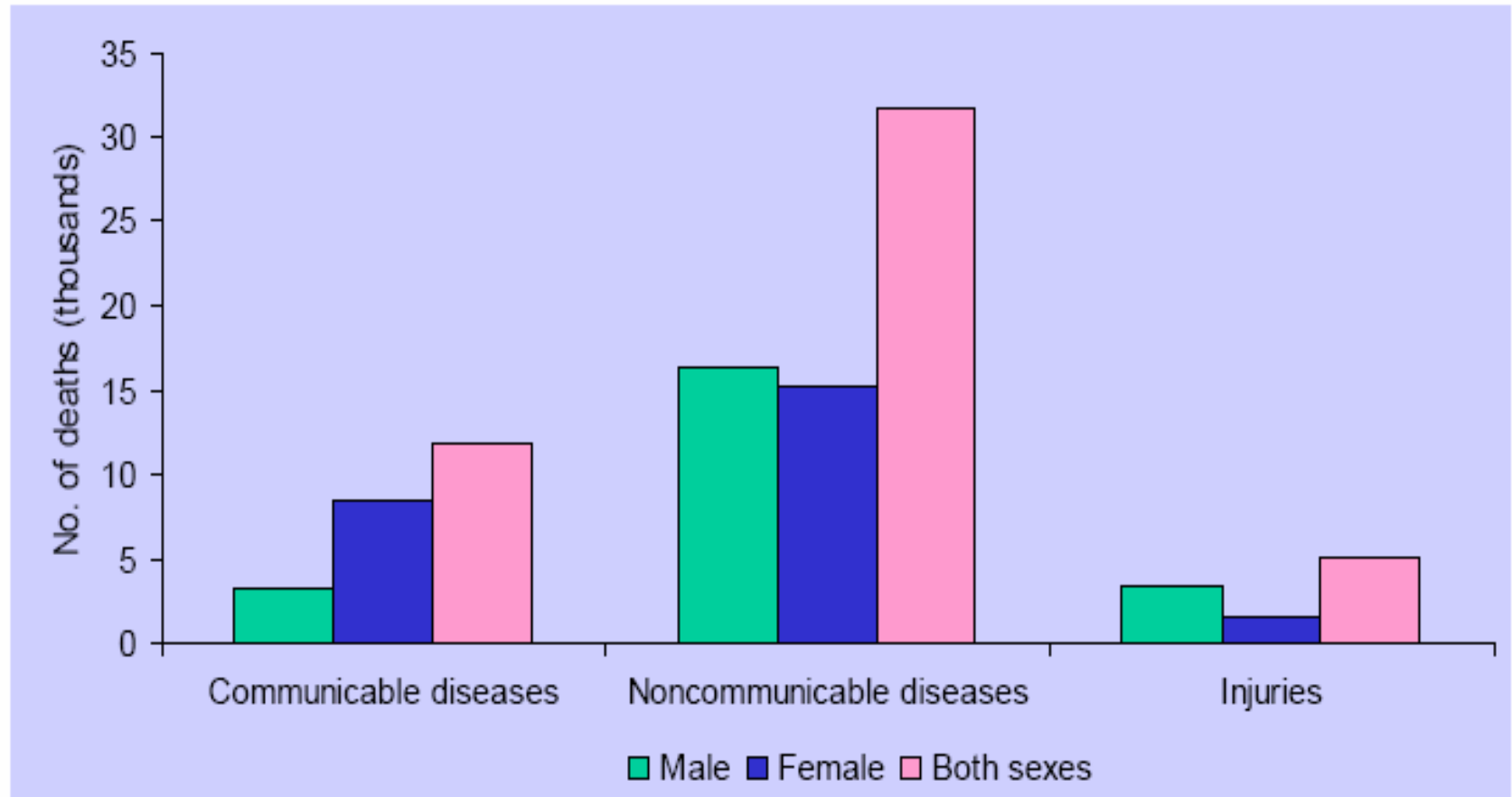


Source: The Injury chart book WHO 2002

# Mortality Rates by Regions

- ◆ Injury rates higher in developing countries
  - 118.8 injury-related-deaths per 100,000 in Africa
  - 47.6 injury-related-deaths per 100,000 in the HIC Europe

# Global Mortality by sex and cause 2000



Source: The Injury Chart book, WHO

# Injury Deaths in South Africa

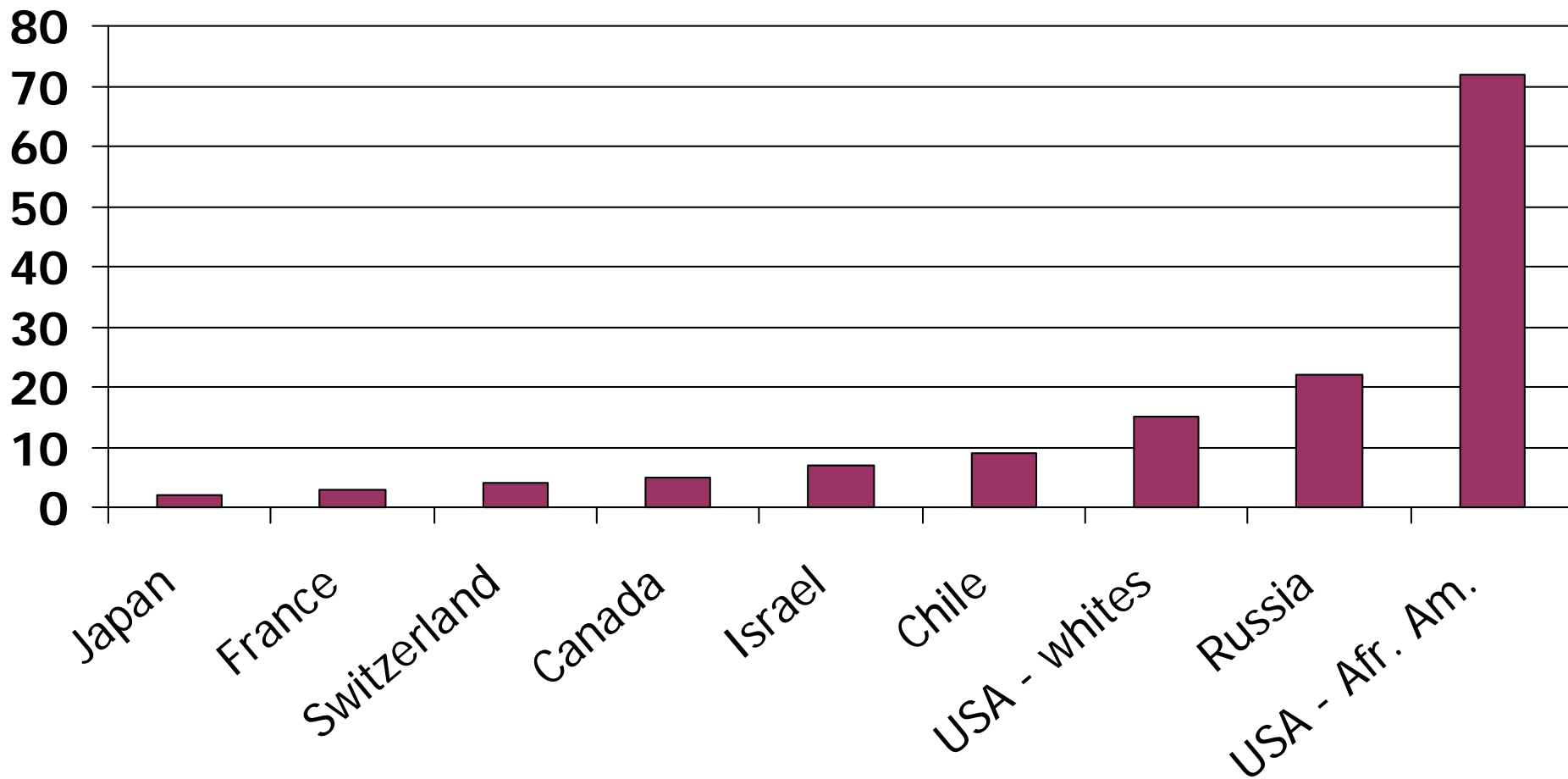
- ◆ In Africa injuries causes approx. 100 deaths per 100,000 population per year ranking third behind diarrhea and malaria
- ◆ Most common injuries causing death:
  - Fall
  - Road traffic injuries
  - Assault
  - Burns
  - Poisoning

# Injury Deaths in Mexico (1996)

- ◆ Accidents are the third leading cause of deaths in Mexico
- ◆ 8% of mortality in 1996 due to accidents
- ◆ Motor vehicle crashes caused 45.5% of accident related deaths in 1996
- ◆ Most frequent locations with injury mortality were public roads, streets, or the home

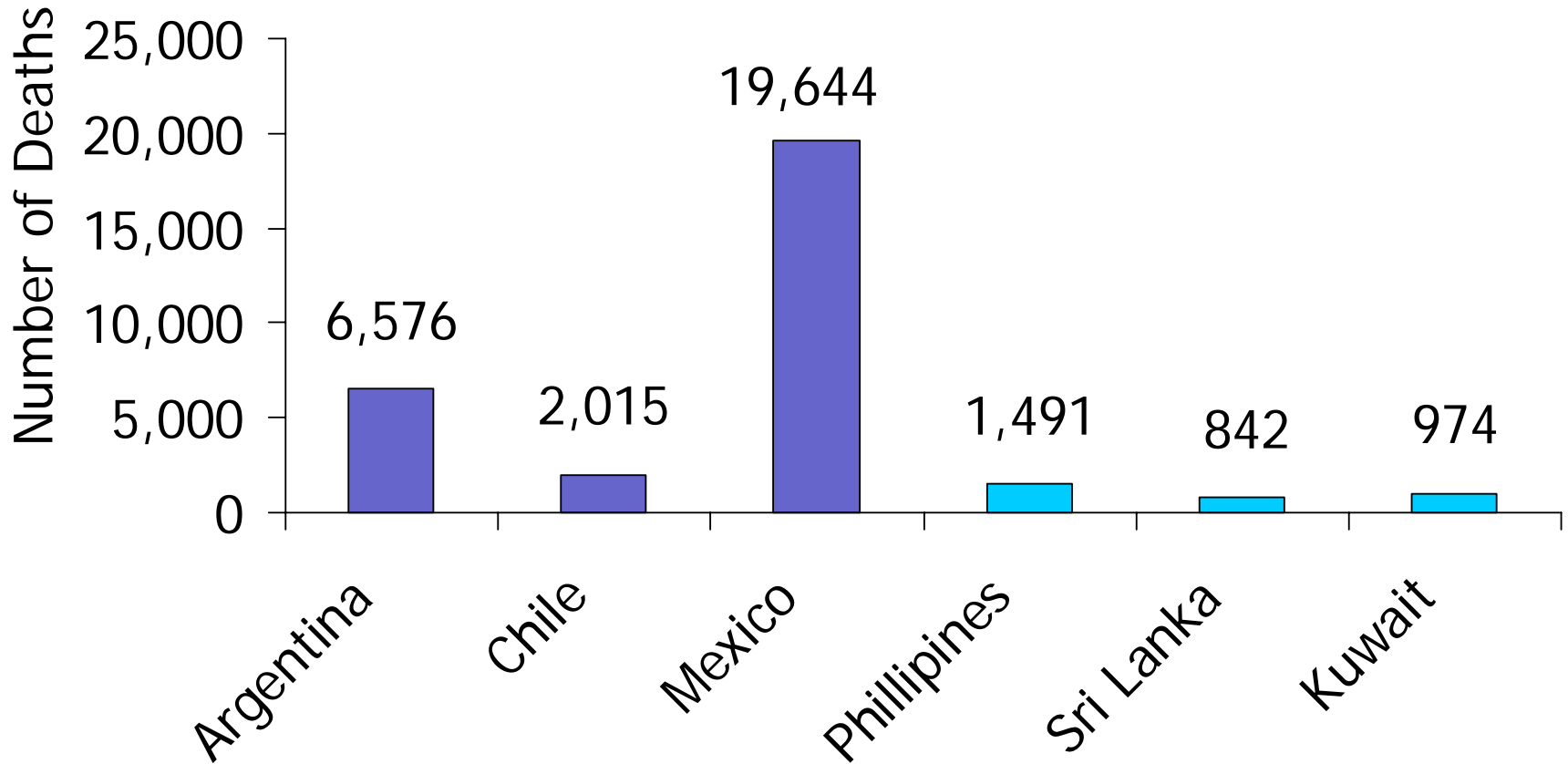
# Adjusted Male Mortality from Homicides

*Selected Countries—Rates/100,000 pop., 1989-91*



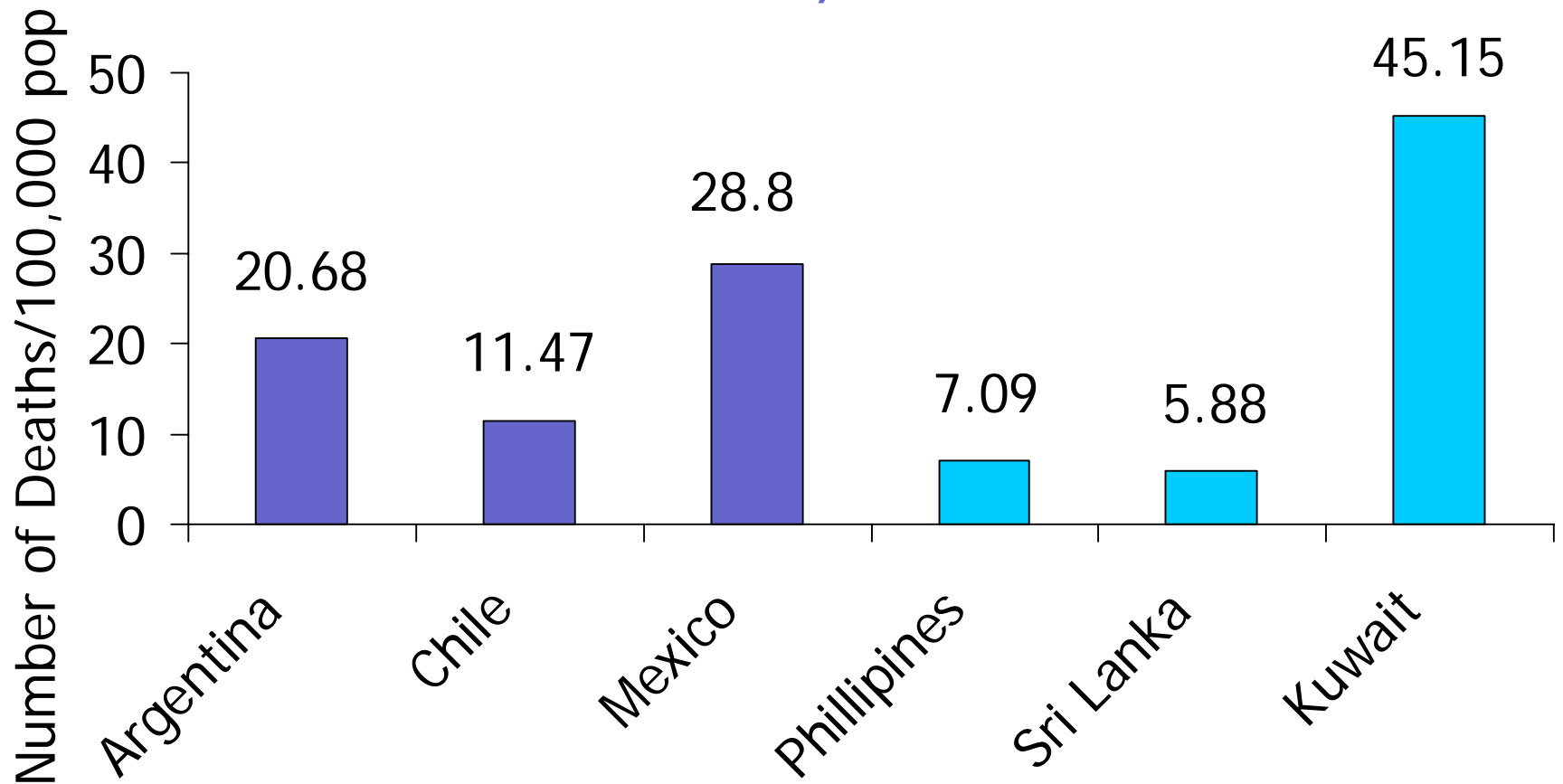
Source: Soc Prev Med, 1994

# Total Number of Deaths Worldwide from MVC, 85-89

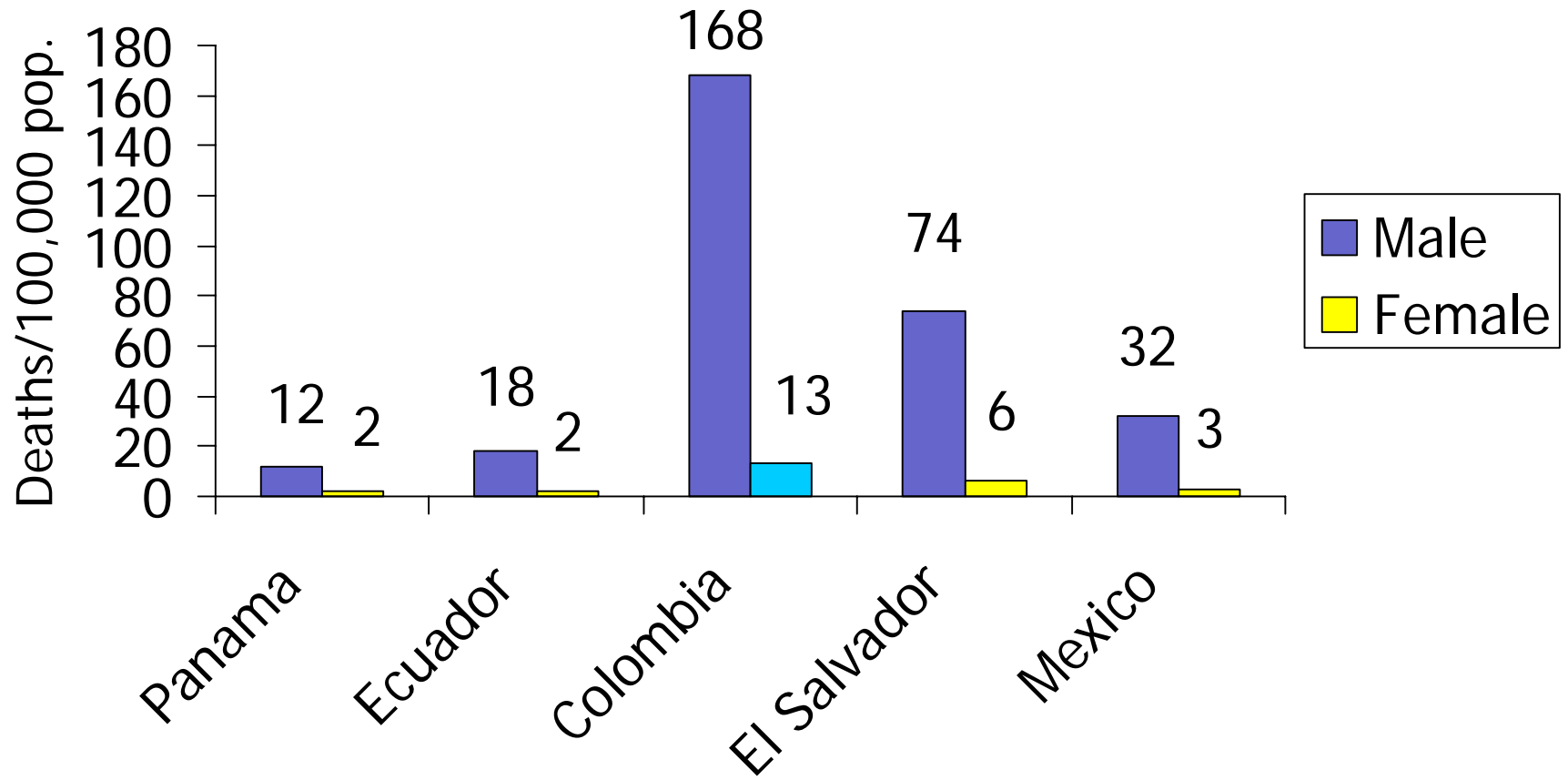


# Age Standardized-World Standard Mortality Rates/100,000 pop

*From MVC, 85-89*

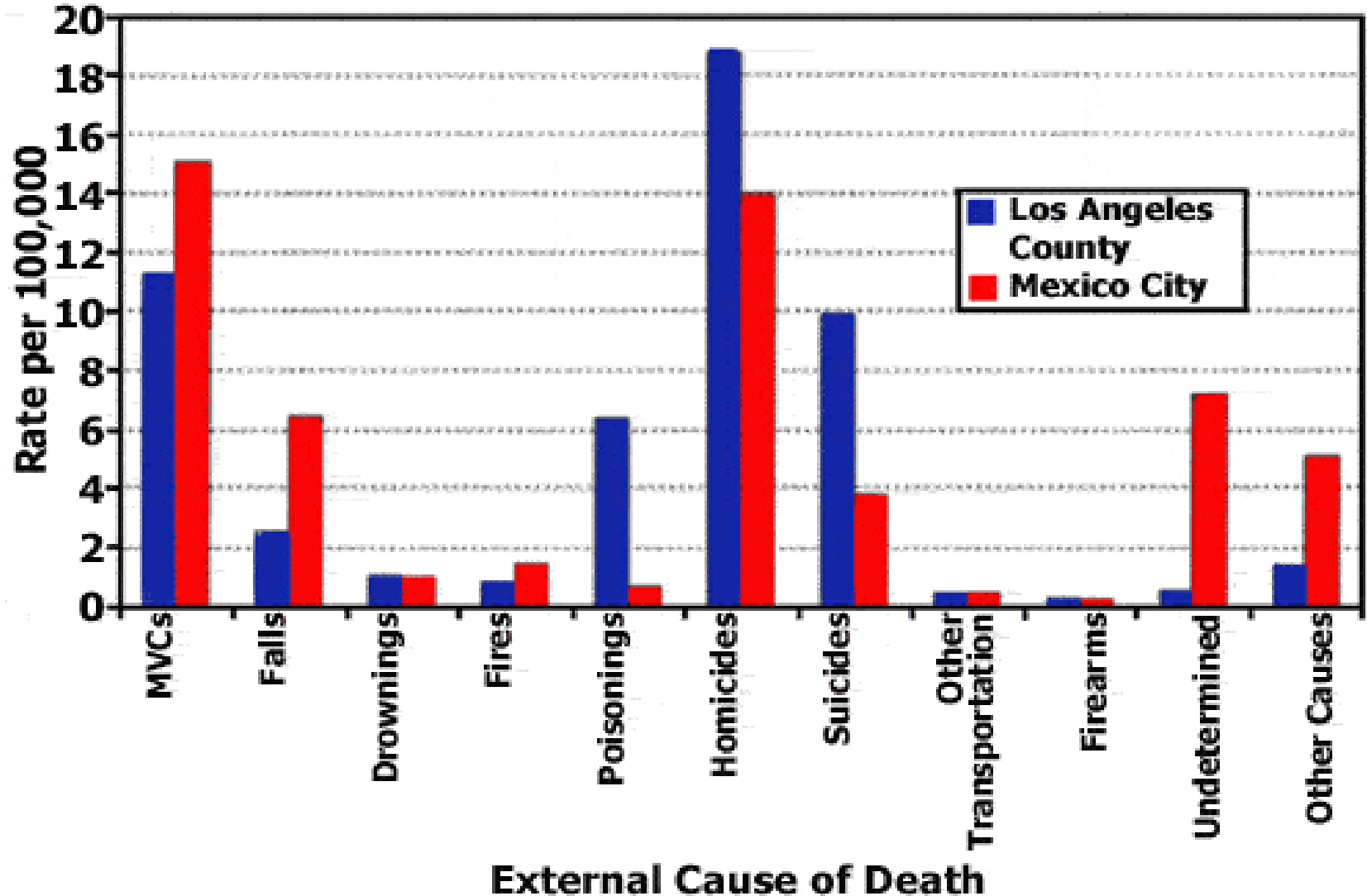


# Deaths /100,000 pop in Various Countries of Latin America



# Age-Adjusted Injury Death Rates

*By Cause, Los Angeles County and Mexico City, 1994–95*



*Adapted by CTLT from: Martha, H., Int J Epid 2000; 29: 715–721*

# Top Three Causes of Injury Deaths in China and U.S.

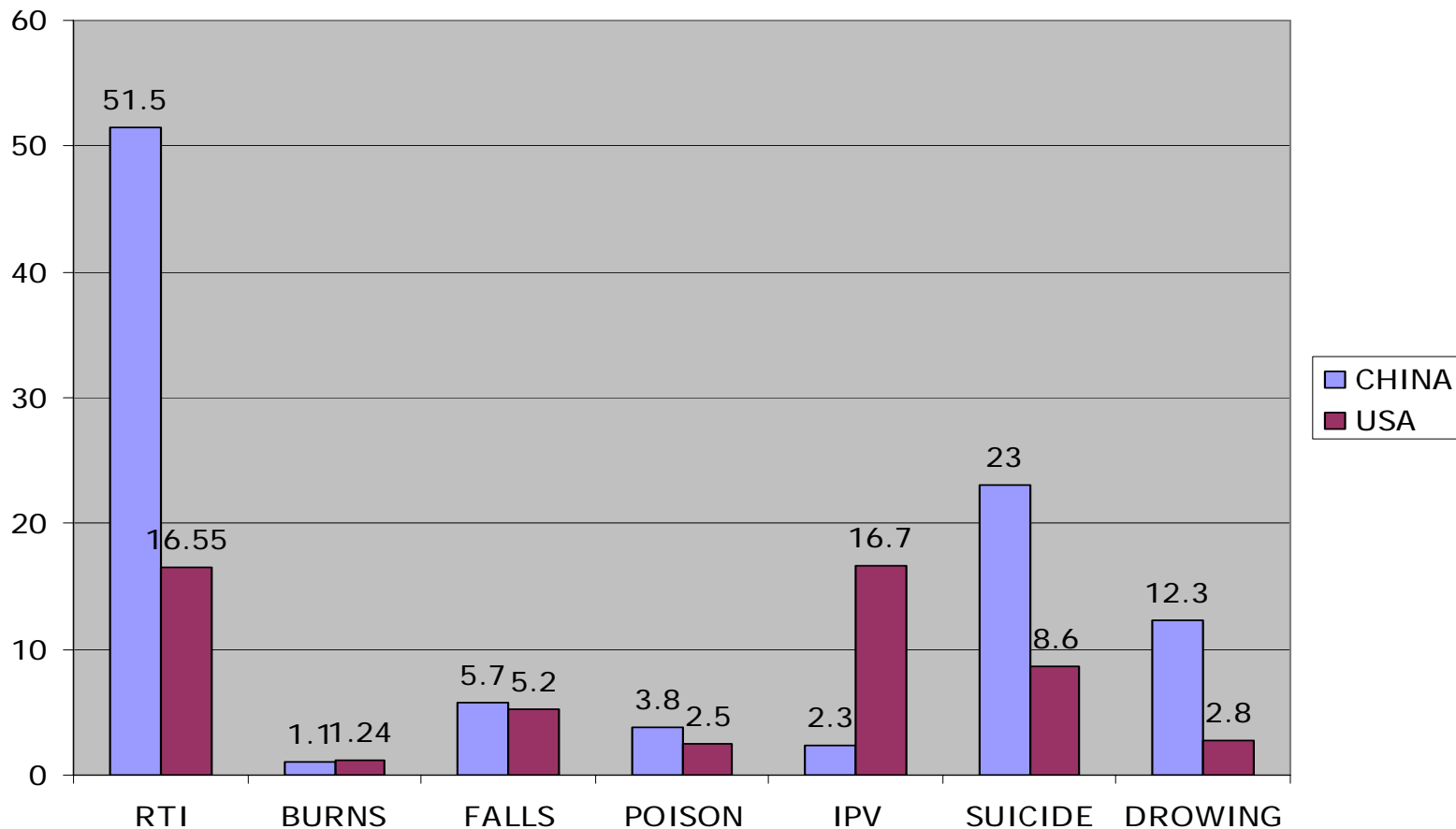
## CHINA

- ◆ RTI
- ◆ Suicide
- ◆ Drowning

## U.S.

- ◆ RTI
- ◆ Interpersonal Violence
- ◆ Falls

# Injury death rates per 100,000 pop. in China and US., 2000



Source: WHO 2002



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## Section D

*Injury Prevention Around  
the World*

# Injury Prevention Programs

- ◆ Young (late 1950's)
- ◆ Small
- ◆ Scattered (and inconsistently applied)
- ◆ Neither comprehensive nor exclusive (uncoordinated)
- ◆ Different target objectives
- ◆ Research vs. program implementation (vs. participatory action research)

# Myths to Injury Prevention

- ◆ Individual behavior and uncontrollable random events cause most injuries
- ◆ Injury interventions don't exist (feasibility)
- ◆ Injury interventions don't work (ineffective)
  - Risk homeostasis
- ◆ Injury interventions are too expensive (inefficient)

# Barriers to Injury Prevention

- ◆ Fragmented interest (classification matters)
- ◆ Lack of common language
- ◆ Limited scientific and policy information
- ◆ Economic and political constraints
  - Limited funding
  - Fragmented responsibilities
  - Organizational difficulties
  - Turf battles
- ◆ Lack of leadership

# Types of Programs

- ◆ Target area: Local / regional / national / multinational / international
- ◆ Focus:
  - Implementation and standardization of surveillance, coding, and reporting
  - Identification of dangerous items / standardization of product safety standards
  - Legislation and regulation
  - Training
  - Implementation programs/practice
  - Research

# Some Highlights

- ◆ WHO
  - Violence and injury prevention department
  - Safe communities
- ◆ European consumer safety association
- ◆ Institute for International Health
- ◆ Research “health and violence” (Colombia)

# Brief History of the U.S. Programs

## Before the Mid-1950's

- ◆ Almost nothing

# Brief History of the U.S. Programs

## Mid-1950's to Mid-1960's

- ◆ U.S. Public Service Division of Special Health Services Program of Accident Prevention (1956)
- ◆ American Association for Automotive Medicine (now Association for the Advancement of Automotive Med.) (1957)

# Brief History of the U.S. Programs

## Mid-1960's to early 1970's

- ◆ Flurry of activity
  - Individuals among others: Haddon, Nader, Baker, Waller
  - Establishment of:
    - National Highway Safety Bureau (now NH Traffic Safety Administration) (1967)
    - Consumer Product Safety Commission (1972)

# Brief History of the U.S. Programs

## Mid-1970's to Mid-1985

- ◆ Not much

# Brief History of the U.S. Programs

## The 1980's

- ◆ *Injury in America: A Continuing Public Health Problem.* Nat'l Research Council (1985)
- ◆ Congress developed CDC-based injury prevention program (NCIP and CIRPs)

# Brief History of the U.S. Programs

## Since 1980

- ◆ *Injury Prevention: Meeting the Challenge.* Nat'l Committee for Injury Prevention and Control (1989)
- ◆ Inclusion of goals in *Healthy People 2000*, DHHS (1990)
- ◆ *Reducing the Burden of Injury: Advancing Prevention and Treatment.* Inst of Med Committee on Injury Prevention and Control (1999)

# Brief History of the U.S. Programs

- ◆ Concern appears only after the physical, economic, social and physiological costs have exceeded the threshold level of maximum tolerable disturbance

# How to Promote the Field

- ◆ Awareness
  - Of the problem
  - Of its solutions
- ◆ Collaboration / coordination

## . . . And

- ◆ Strengthen individual knowledge and skills
- ◆ Changing organizational practices
- ◆ Influencing policy and legislation
- ◆ Fostering coalitions and networks
- ◆ Educating providers
- ◆ Promote community education

*Source: Cohen, et al., Injury Prev 1999; 5: 203–207*