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Acute Care

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Lecture Topics

- The importance of timely trauma care
- Developing and evaluating an acute trauma care system
- Trauma care in the developing world
- Responses to trauma
- Case study in acute care

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Section A

The Importance of Timely Trauma Care

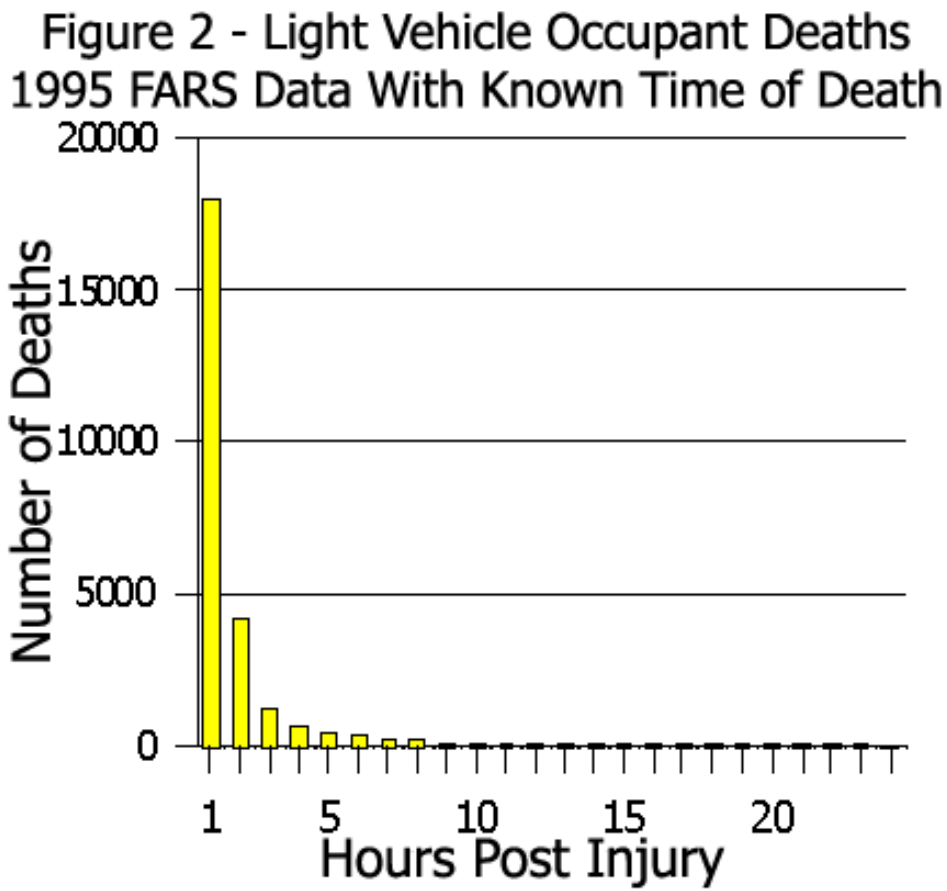
Maria Segui-Gomez, MD, ScD

Objective

- Restore person’s quality of life

Time of Death

- Most deaths occur at the scene (e.g., MV fatalities)
- One-third within an hour, one-third within a month, one-third within a year
- The “golden hour”



Source: Luchter, 1999

Trauma Care Issues

- Acute trauma care:
  - Early case identification
  - Pre-hospital care: Delivery and transport to hospital
  - Trauma care system development
  - Triage criteria
- Rehabilitation efforts
- Financial arrangements

Early Case Identification

- Communication infrastructure
  - Telecommunication
  - Access
- Triage criteria

Pre-Hospital Care:

Delivery and Transport to Hospital

“Scoop and Run” vs. “Stay and Treat”

Continued

Pre-Hospital Care:

Delivery and Transport to Hospital

“Scoop and Run” vs. “Stay and Treat”

- EMTs and paramedics vs. physicians
- Ground vs. air transport

Trauma Care System Development

- Characterization of trauma centers (hospital specialization)
  - Definition of minimums
  - Verification system

Continued

Trauma Care System Development

- Development of regional (state and national) trauma systems
  - Designation
  - Who wants to participate and who doesn't?

Triage Criteria

- At different levels:
  - Scene
  - Hospital
  - Rehabilitation
- Standardized protocols
  - E.g., Advanced Trauma Life Support

Source: Mock, et al. 1999

Trauma Rehabilitation Care

- Plan it early into acute care
- Challenging in less resourceful environments
  - Money
  - Technology

Financial Arrangements

Patient Level

- Payment method
  - Fee for service
  - Insurance
    - Trauma patients as uninsured (younger and/or lower socio-economic level)
    - Tort/non-fault

Financial Arrangements

Patient Level

- Payment method
  - Effect on physicians/hospitals

System Level

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Section B

Developing and Evaluating an Acute Trauma Care System

Maria Segui-Gomez, MD, ScD

In the U.S.

Advances in:

- Medical understanding of injuries and capabilities to treat them
- Development of system of care
  - Faster and better pre-hospital transport
  - Emergency medicine and trauma surgery as specialties
  - Promulgation of Advanced Trauma Life Support
  - Development of trauma centers/systems

Source: Mock and Jurkovich, 1999

The Players

- The role of trauma surgeons vs. orthopedists, neurosurgeons, plastic surgeons, maxilofacial surgery, internist (blunt injuries)
  - The growth of emergency medicine as a specialty
- The political power of professional organizations (e.g., Committee on Trauma of the American College of Surgeons, American Association of Trauma Surgeons)

In Less Resourceful Environments . . .

- Development of infrastructure
  - Collaborate with other sectors to improve communication and transport
  - Establish information systems that identify nature, causes, and severity of injury at all levels of care

Continued

In Less Resourceful Environments . . .

- Ensure professionals and community competence
  - Develop standard injury assessment and treatment routines
  - Have professionals from more sophisticated centers do intensive courses in less sophisticated centers
  - Provide basic training at the community level: first aid, assessment, and management

Continued

In Less Resourceful Environments . . .

- Organize and maintain sustainable supply systems
  - Develop and update supply lists
  - Establish distribution systems that equitably supply all levels of health services
  - Develop simple and durable equipment (e.g., limb replacement)

Source: Barss, et al., 1998

Evaluating the System

Data sources:

- Outpatient databases
- EMS databases
- Emergency dept. databases
- Hospital databases:
  - Inpatients:
  - Trauma registries
  - Rehabilitation
  - Outpatients

Data elements:

- Outcomes
- Injury type, severity, treatment, (including mortality and length of stay), pre-injury condition

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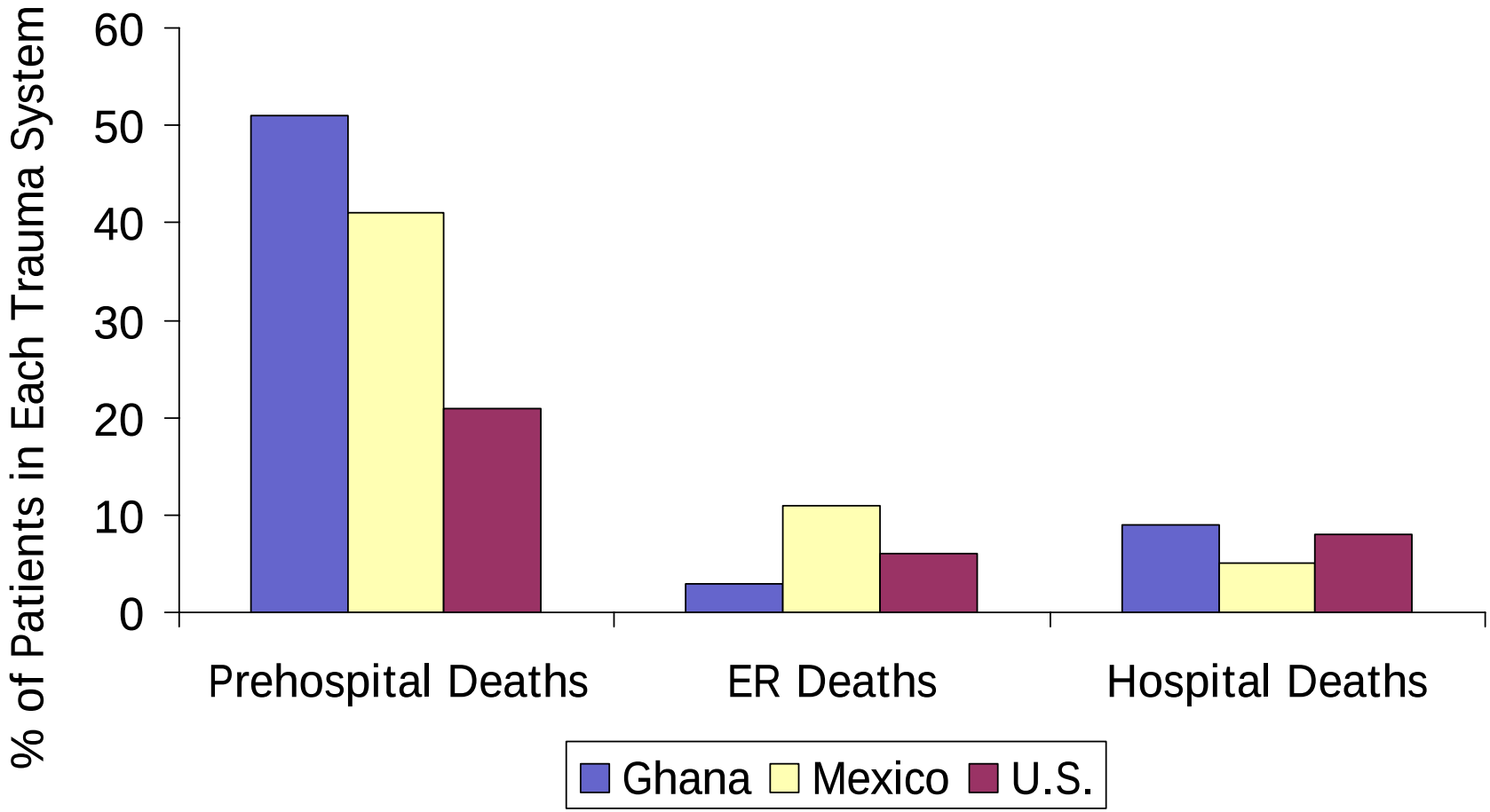
Section C

Trauma Care in the Developing World

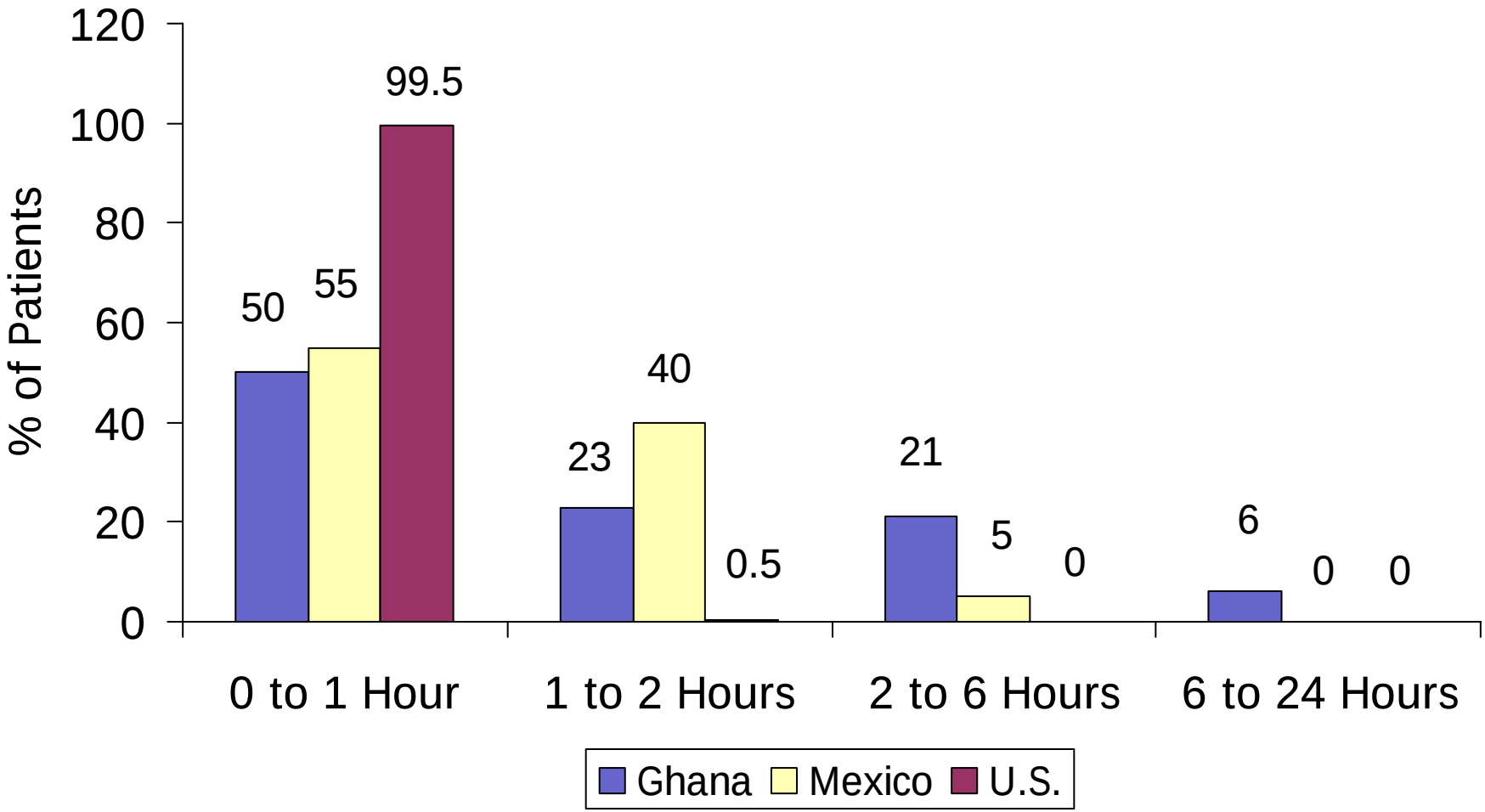
Adnan Hyder, MD, PhD

% of Patients Dying According to Site of Death

Within the Trauma Systems in Ghana, Mexico, and the U.S.

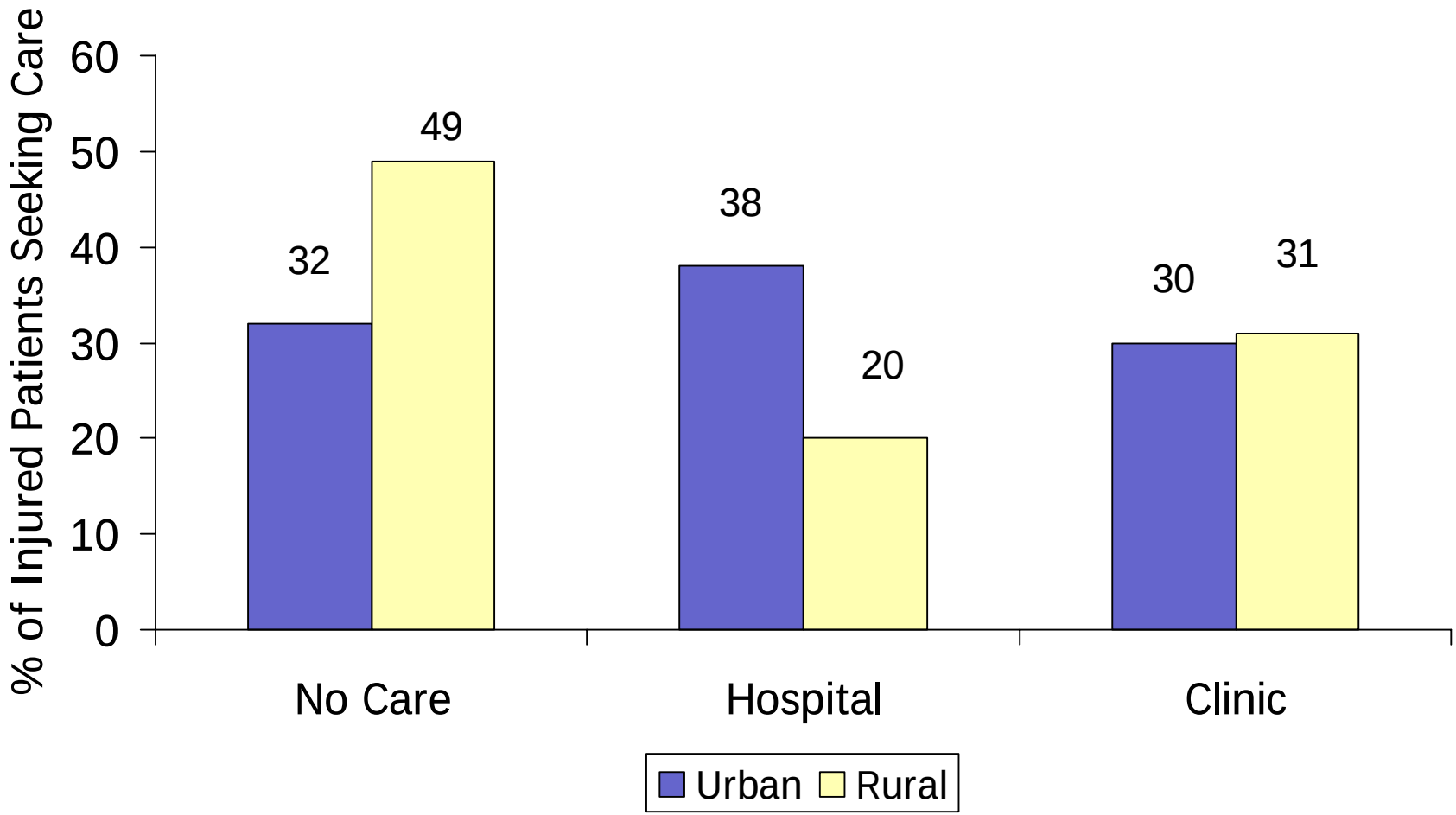


Pre-Hospital Time for Patients who Arrived within 24 Hours of their Injury



Utilization of Formal Medical Services for Non-Fatal Injuries

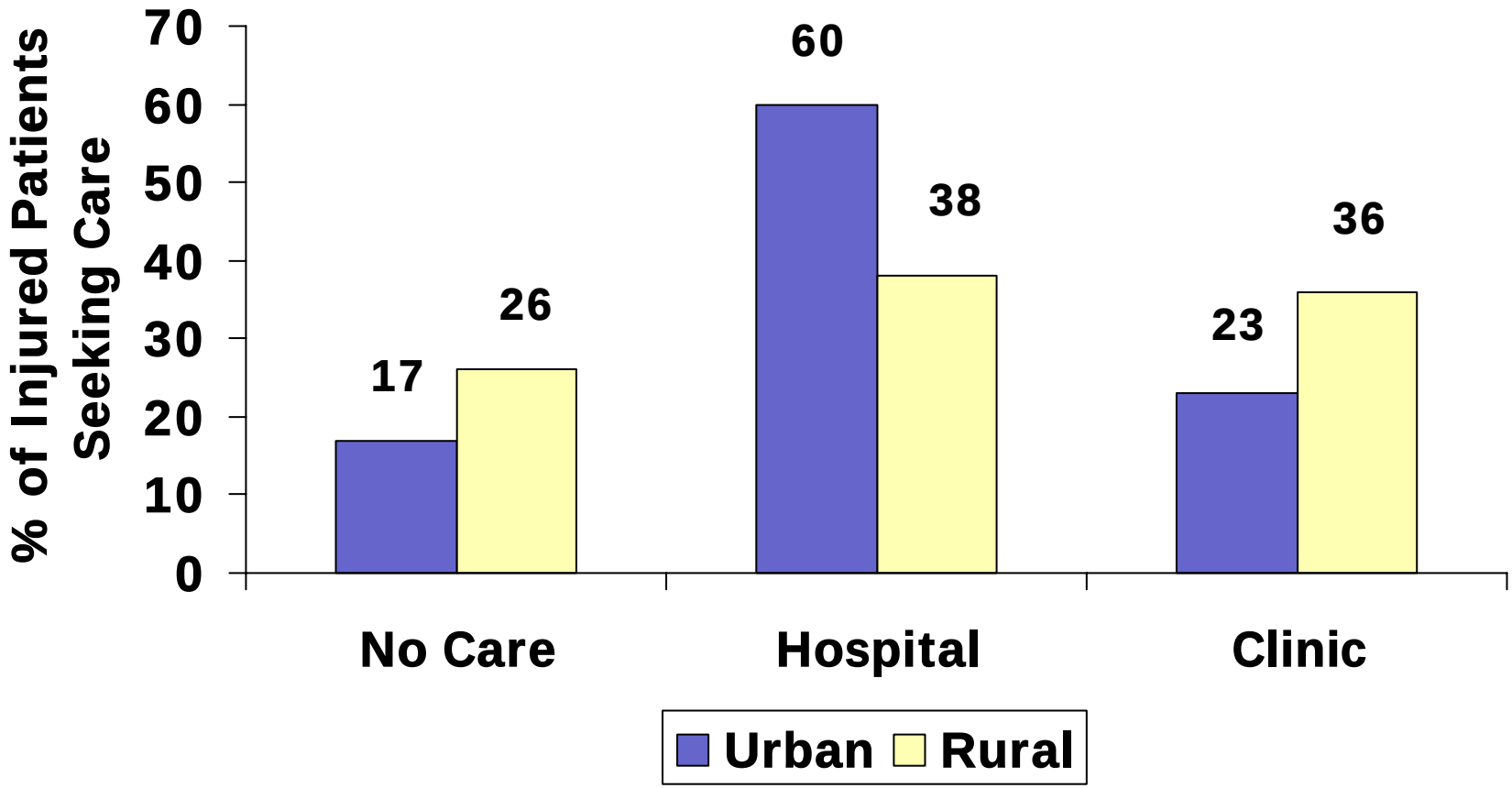
In Urban vs. Rural Ghana (All Injured)



Source: Mock C.N., et al., J Trauma *1997; 42: 504–511*

Utilization of Formal Medical Services for Non-Fatal Injuries

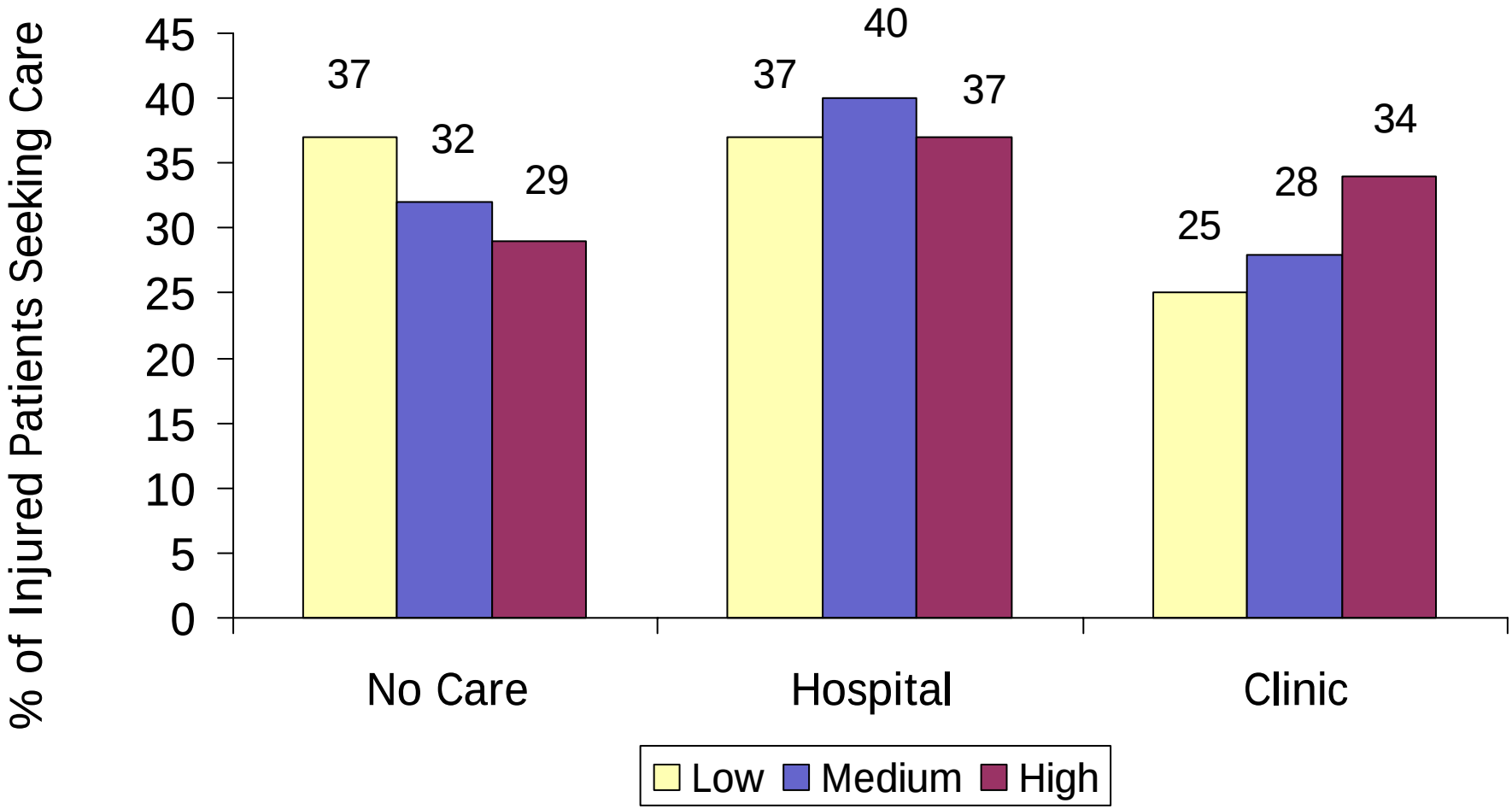
In Urban vs. Rural Ghana (Severely Injured)



Source: Mock C.N., et. al. J Trauma *1997; 42: 504–511*

Utilization of Formal Medical Services for Non-Fatal Injuries

In an Urban Area in Ghana by Socioeconomic Status (All Injured)



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Utilization of Formal Medical Services for Non-Fatal Injuries

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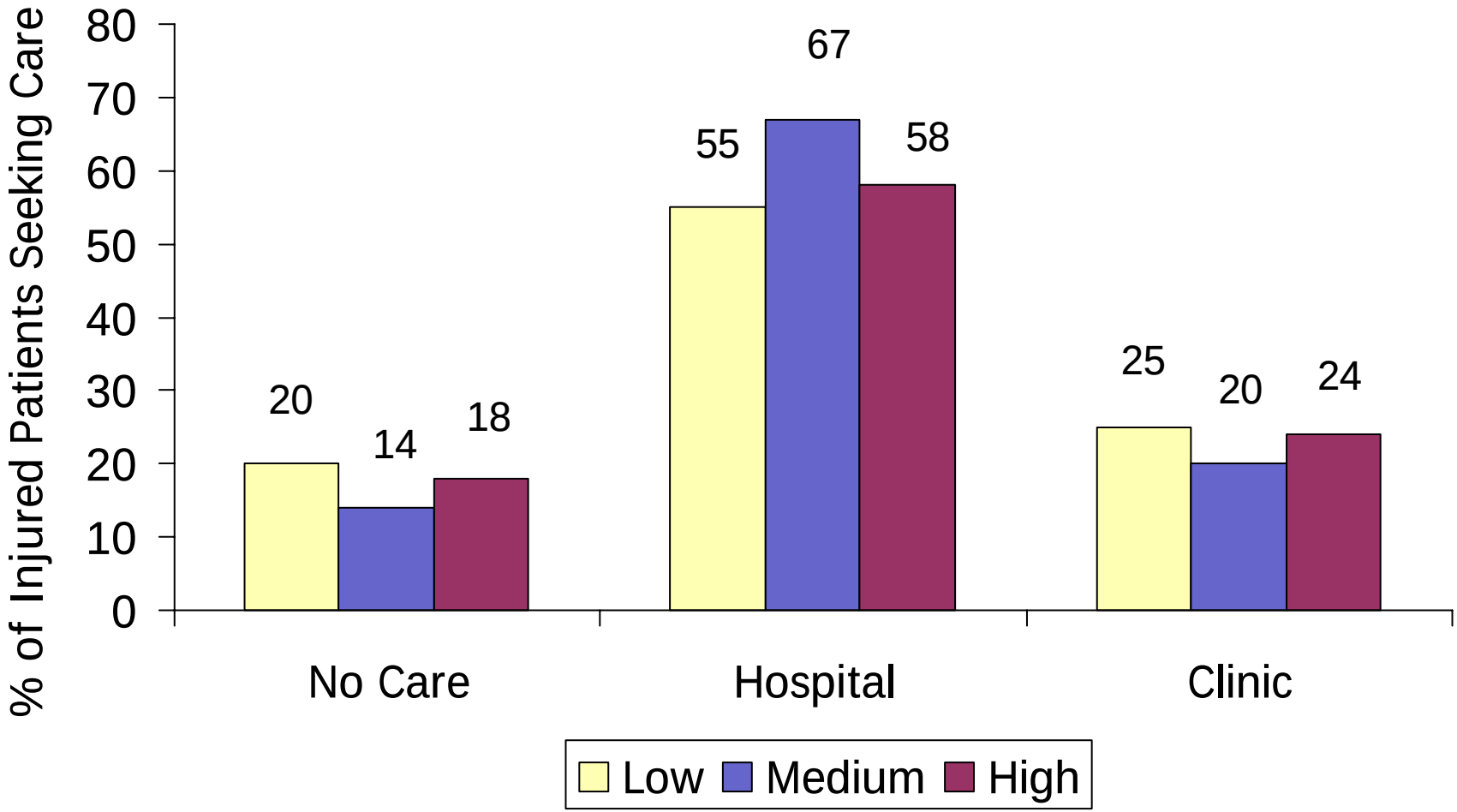


Source: Mock C.N., et al., J Trauma *1997; 42: 504–511*

Utilization of Medical Services

In an Urban Area, Ghana, Based on Type of Injury

Mechanism	No Care %	Hospital %	Clinic %
Transportation	10	69	21
Burns	30	45	25
Assaults	16	42	42
Falls	47	31	22
Snake Bite	0	100	0
Non-intentional Penetrating	34	20	46
Non-intentional Blunt	40	34	26

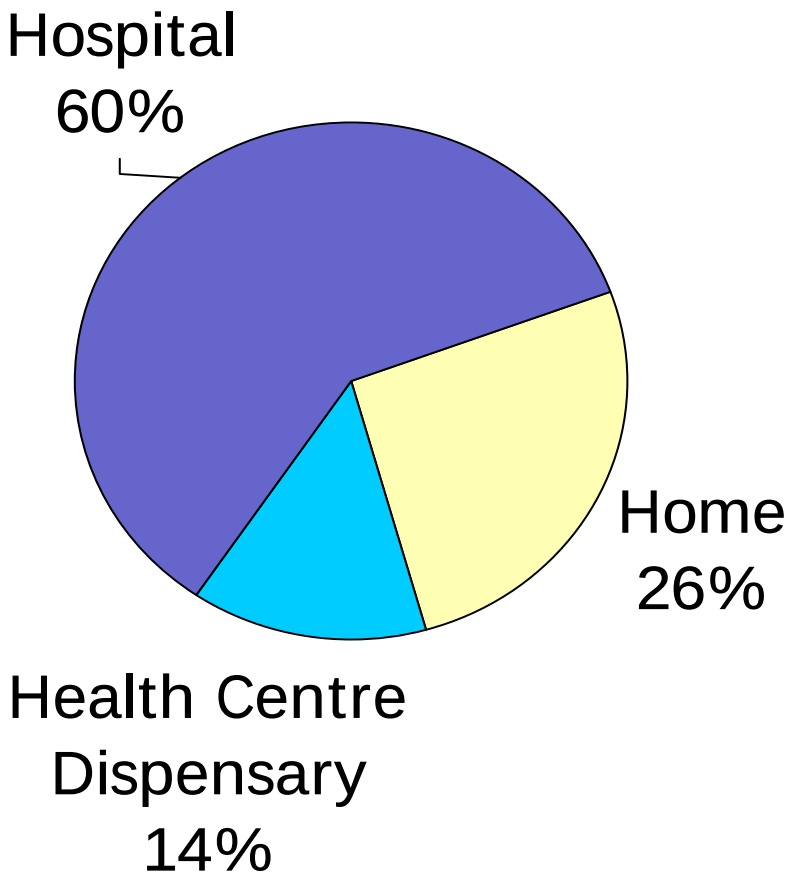
Utilization of Medical Services

In a Rural Area, Ghana, Based on Type of Injury

Mechanism	No Care %	Hospital %	Clinic %
Transportation	29	39	32
Burns	67	09	24
Assaults	33	35	32
Falls	59	18	23
Snake Bite	40	27	33
Non-intentional Penetrating	50	13	37
Non-intentional Blunt	46	27	27

Initial Management with Acute Injury

Results from Household Survey in Pakistan



Source: Ahmed M., et al., Trop Med Int Health *4: 846–857*

Transport to Emergency Medical Facilities, Egypt

- The ***mode of transport*** for the injured to emergency medical departments was as follows:
  - Private cars: 55%
  - Public ambulances: 33%
  - Work ambulances: 13%

Source: Haman A.M., et al., Trauma Quart*; 14: 261–267*

Continued

Transport to Emergency Medical Facilities, Egypt

- The time interval between injury and arrival at the hospital was ***36 minutes on average***
- ***Those transported with ambulances had the best outcome***

Source: Haman A.M., et al., Trauma Quart*; 14: 261–267*

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Section D

Responses to Trauma

Adnan Hyder, MD, PhD

Emergency Medical Services (EMS) Development in Jamaica

- In 1976, the government of Jamaica signed the second World Bank loan for a population project
- A component of this project was to strengthen the emergency medical services

Source: Jacobs L.M., Trauma Quart *1999; 14: 221–225*

Continued

Emergency Medical Services (EMS) Development in Jamaica

- The first phase included introduction of the Jamaican team to the modern, urban, emergency medical services in the city of Boston
- On return, the team presented the concept of modern emergency medical services to the ministry of health

Source: Jacobs L.M., Trauma Quart *1999; 14: 221–225*

Continued

Emergency Medical Services (EMS) Development in Jamaica

- Officials from PAHO, Red Cross, defense force, fire department, and ministry of works were involved
- Ministry of health convened a conference and a bilateral workshop between EMS officials in Boston and the work team in Jamaica

Source: Jacobs L.M., Trauma Quart 1999; 14: 221–225

Continued

Emergency Medical Services (EMS) Development in Jamaica

- The recommendations from this conference were then agreed upon and served as the core for the formulation of a national policy on emergency services and disaster preparedness

Source: Jacobs L.M., Trauma Quart *1999; 14: 221–225*

Questions on Jamaica Model

- Is this the right model for establishing EMS in a developing world?
- Which stakeholders have been left out?
- What would you recommend to a country on EMS?

Role of Advanced Trauma Life Support Program in Trinidad and Tobago

- Developed in 1978
- Intent was to teach small town family physicians ***a safe approach to the initial service of severely injured patients***
- Course adopted by American College of Surgeons (ACS) in 1980

Source: Krantz B.E., Trauma Quart *1999; 14: 323–328*

Continued

Role of Advanced Trauma Life Support Program in Trinidad and Tobago

- In 1986 a pilot project was done in Trinidad and Tobago with ACS to conduct ATLS there
- Subsequent reports showed that the entire system of care was enhanced
- Pre-hospital programs improved; frequency of early intervention using ATLS guidelines increased; and the outcome of patients improved

Source: Krantz B.E., Trauma Quart *1999; 14: 323–328*

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Section E

Case Study in Acute Care

Maria Segui-Gomez, MD, ScD

Background

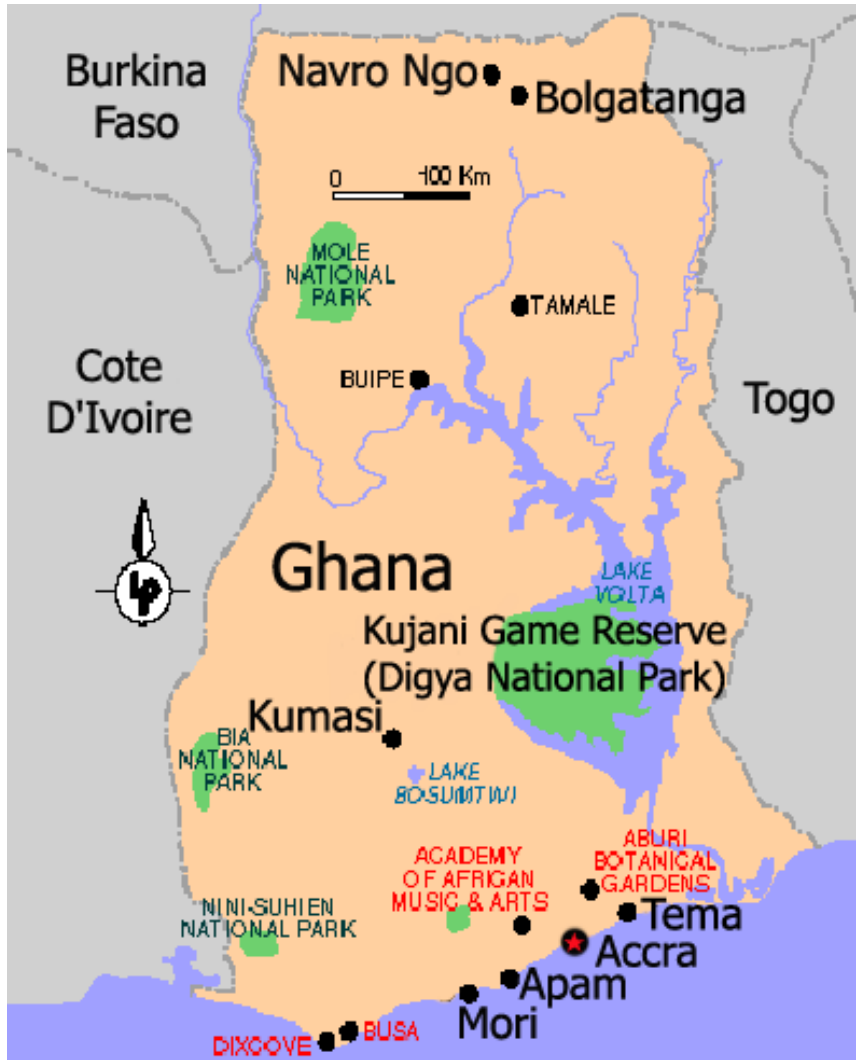
- This manuscript was part of a whole issue of *Trauma Quarterly* devoted to descriptions of Trauma Systems around the world
- For more information, see *Trauma Quarterly* 1999 (14)

The Issues

- Trauma as a health problem
  - Definition of injury
  - Data systems
- Medical response to the problem
  - System characteristics

The Setting

- Republic of Ghana
- West Africa:
  - 93,030 sq. miles
  - 19.7 M pop
  - GDP per capita: $1,310 (U.S.)
  - Health care budget per capita $12 (U.S.)
  - Major industries: mining, lumber, cocoa, light manufacturing



Map adapted by CTLT

Data for Planning

- Death certificates
  - No
- Hospital records
  - Yes
  - But limited hospitalization
- Special survey
  - But limited geographical area
- Motor vehicle crashes, falls, unintentional penetrating (occupational?), important source of injuries

When are the Deaths* Occurring?

	%
Pre-Hospital (scene)	81
ER (or within four hours of arrival at hospital)	5
Hospital	14

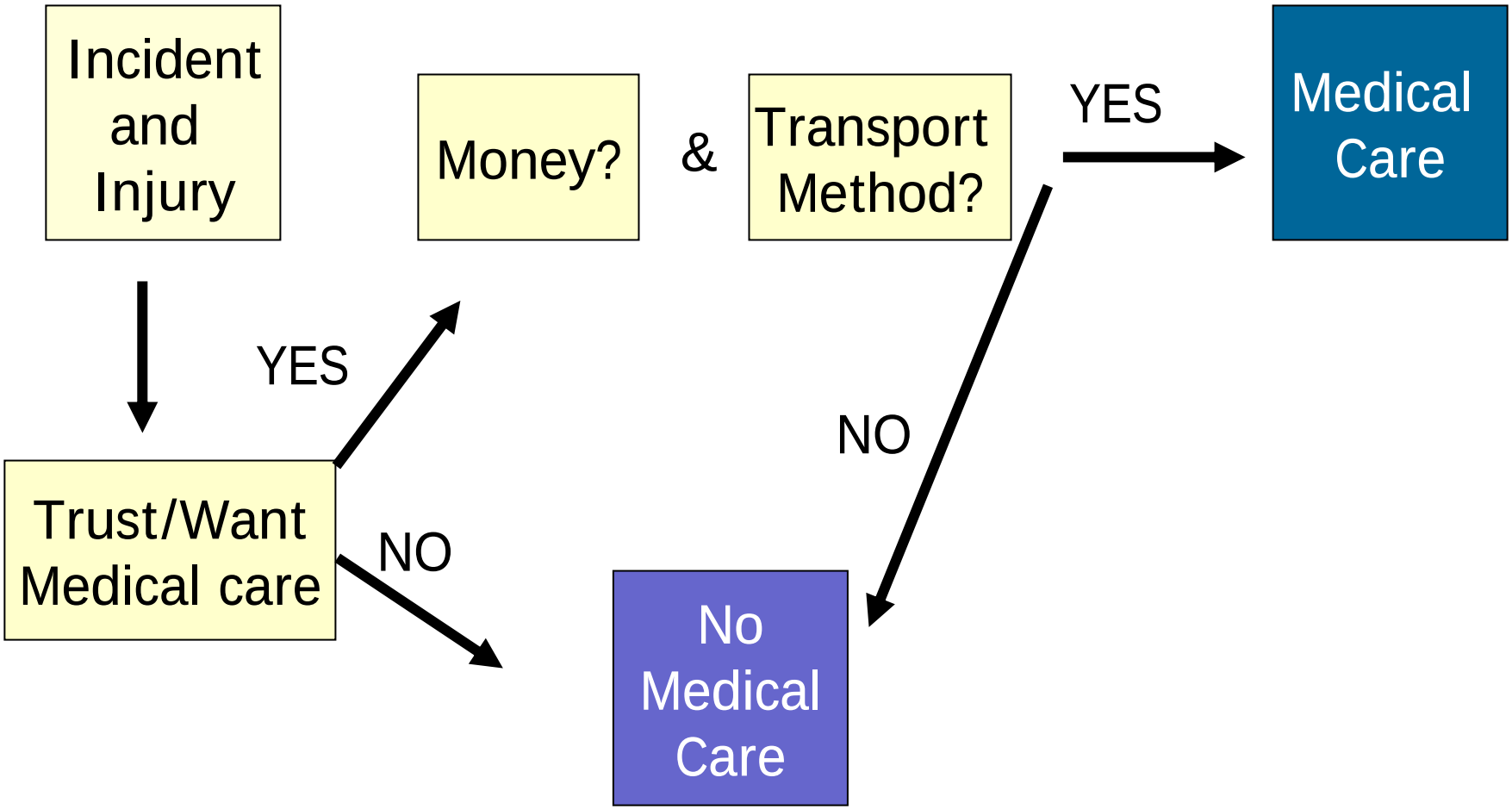
* Survey + hospital data (limited to Kumasi)

Where is Medical Care Provided*?

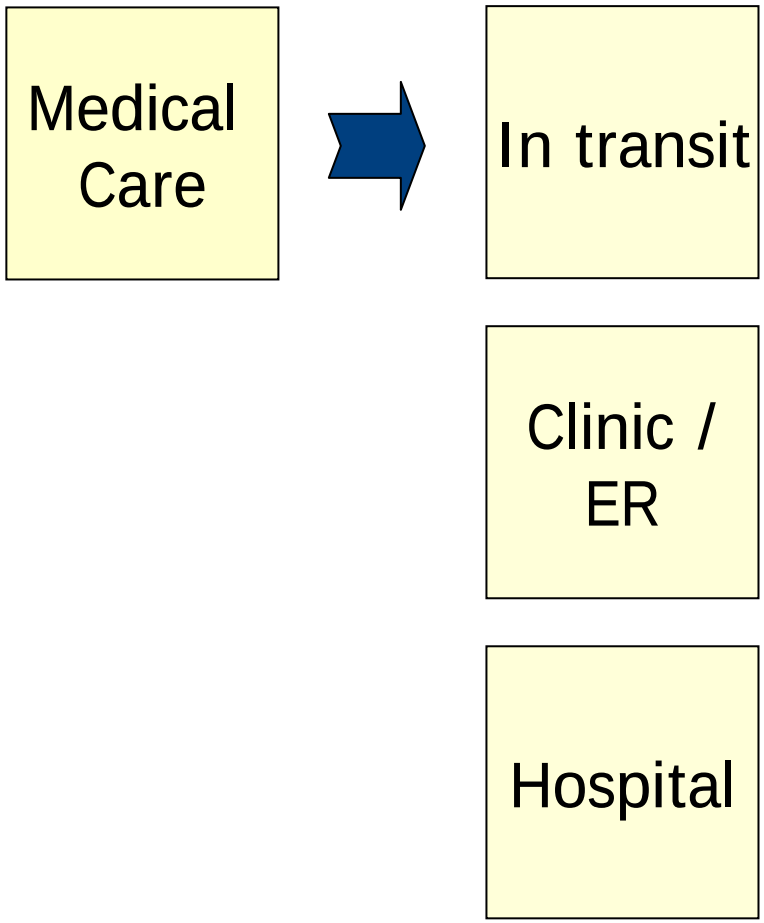
	Urban	Rural
Hospital (ED and inpatient)	60%	38%
Clinic (outpatient?)	23%	36%
None	17%	26%

*Of all injuries that resulted in >=1 of restricted activities (including death)

Sequence of Events



Once at Medical Care Provider



- Personnel qualification
- Facility appropriateness
- Diagnostic and treatment equipment
- Drug availability
- Financing mechanism

Additional Issues for Consideration

- Poor communication systems
- Poor telecommunication systems
- Health policy agenda dictated by international organizations

Where to Start?

- Where and how would you start an improvement program?