EMERGENCY AND TRAUMA CARE

DCP3 | Disease Control Priorities

OVERVIEW

- Emergency and Trauma Care Systems
- The DCP emergency components of essential packages
- WHO Emergency Care System Framework
- Emergency Care System Assessment Tool

PREVENTION

PREHOSPITAL & TRANSPORT

TRAUMA

FACILITY-BASED CRITICAL CARE

EMERGENCY **CARE** SYSTEMS

SYSTEMS

REHABILITATION

Of 45 million annual deaths in LMICs,

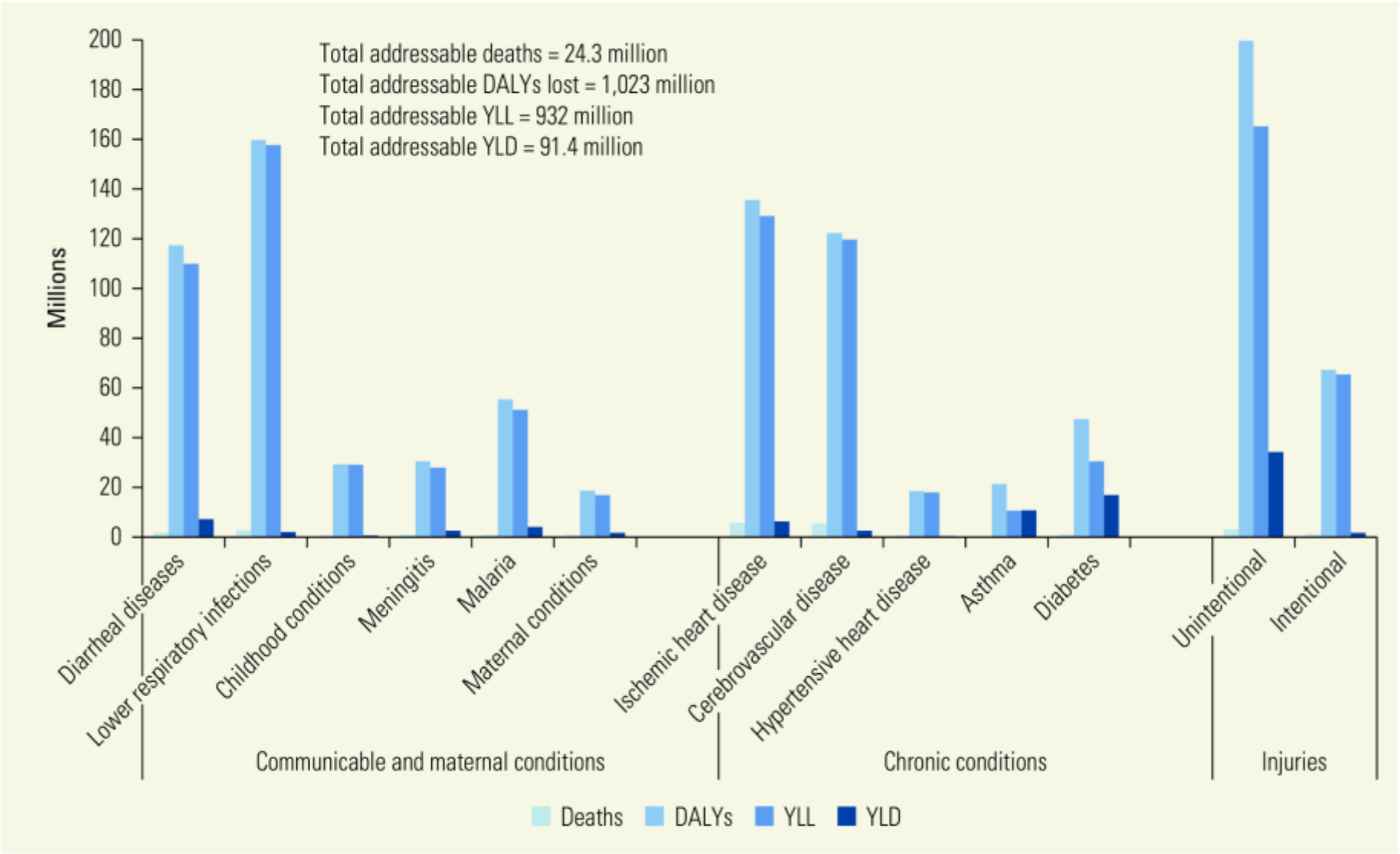
54%

are due to conditions
addressable by
prehospital and emergency care.

1,023 million DALYs,
932 million years of life lost
to premature mortality.

DCP3 | Disease Control Priorities

Figure 14.1 Burden of Disease Potentially Addressable by Prehospital and Emergency Care in LMICs



Source: Data from WHO 2013.

Note: DALYs = disability-adjusted life years; LMICs = low- and middle-income countries; YLD = years lived with disability; YLL = years of life lost.

Emergencies occur everywhere, and each day they consume resources regardless of whether there are systems capable of achieving good outcomes.

Kobusingye, Bulletin of WHO

EMERGENCY CARE SYSTEMS

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EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

Table 1.1 The Essential Surgery Package: Procedures and Platforms[a,b]

Type of procedure	Platform for delivery of procedure[c]		
	Community facility and primary health center	First-level hospital	Second- and third-level hospitals
Dental procedures	1. Extraction 2. Drainage of dental abscess 3. Treatment for caries[d]		
Obstetric, gynecologic, and family planning	4. Normal delivery	1. Cesarean birth 2. Vacuum extraction/forceps delivery 3. Ectopic pregnancy 4. Manual vacuum aspiration and dilation and curettage 5. Tubal ligation 6. Vasectomy 7. Hysterectomy for uterine rupture or intractable postpartum hemorrhage 8. Visual inspection with acetic acid and cryotherapy for precancerous cervical lesions	1. Repair obstetric fistula
General surgical	5. Drainage of superficial abscess 6. Male circumcision	9. Repair of perforations: for example, perforated peptic ulcer, typhoid ileal perforation 10. Appendectomy 11. Bowel obstruction 12. Colostomy 13. Gallbladder disease, including emergency surgery 14. Hernia, including incarceration 15. Hydrocelectomy 16. Relief of urinary obstruction: catheterization or suprapubic cystostomy	

table continues next page

Essential packages at each level of the health system include emergency components.

EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

Obstetric, Gynecologic, Reproductive Health and Family Planning

Community Facility and Primary Health Centre

Management of labour and delivery including initial treatment of complications
Post-GBV care (prevention of STI/HIV, emergency contraception, support/counseling)
Management of unintended pregnancy
Management of miscarriage/incomplete abortion and post abortion care*
Antibiotics for pPRoM
Tetanus toxoid*
Screening for complications of pregnancy
Initiate antenatal steroids (as long as clinical criteria and standards are met)*
Initiate magnesium sulphate
Detection of sepsis

First Level Hospital

Management of labour and delivery in high risk women
Caesarean
Vacuum extraction/forceps delivery
Ectopic pregnancy
Vacuum aspiration and dilatation and curette
Hysterectomy for uterine rupture or intractable post-partum haemorrhage
Antenatal steroids*
Magnesium sulphate
Treatment of sepsis
Induction of labour post-term
Ectopic pregnancy case management*
*Detection and management of fetal growth restriction**

* Denotes that the intervention effect was included in the Lives Saved Tool (LiST).

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EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

Obstetric, Gynecologic, Reproductive Health and Family Planning

Child and Newborn Health

Community Facility
Detect and refer severe acute malnutrition
Detect and treat serious infections without danger signs
Thermal care for preterm newborn
Neonatal resuscitation
Oral antibiotics for pneumonia

Primary Health Centre
Treat severe acute malnutrition
Detect and treat serious infections with danger signs*
Kangaroo mother care
Injectable and oral antibiotics for sepsis, pneumonia and meningitis
Jaundice management

First Level Hospital
Treat severe acute malnutrition associated with serious infection*
Detect and treat serious infections with danger signs with full supportive care*
Full supportive care for preterm newborn*
Treatment of newborn complications, meningitis and other very serious infections*

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EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

Obstetric, Gynecologic, Reproductive Health and Family Planning

Child and Newborn Health

Injury

Community Facility and Primary Health Centre

Resuscitation with BLS measures
Suturing laceration
Management of non- displaced fractures

First Level Hospital

Resuscitation with advanced life support measures, including surgical airway
Tube thoracostomy (chest drain)
Trauma laparotomy
Fracture reduction
Irrigation and debridement of open fractures
Placement of external fixator; use of traction
Escharotomy/fasciotomy (cutting of constricting tissue to relieve pressure from swelling)
Trauma-related amputations
Burr hole

EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

Obstetric, Gynecologic, Reproductive Health and Family Planning

Child and Newborn Health

Injury

General Surgical

Community Facility and Primary Health Centre

Drainage of superficial abscess
Drainage of septic arthritis
Debridement of osteomyelitis

First Level Hospital

Repair of perforations: for example, perforated peptic ulcer, typhoid ileal perforation
Appendectomy
Bowel obstruction
Colostomy
Gallbladder disease, including emergency surgery
Hernia, including incarceration
Relief of urinary obstruction: catheterization or suprapubic cystostomy

EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

Obstetric, Gynecologic, Reproductive Health and Family Planning

Child and Newborn Health

Injury

General Surgical

Mental, Neurological, and Substance Abuse Disorders

Community Facility and Primary Health Centre

Management of prolonged seizures or status epilepticus (neurological disorders)
Emergency management of poisoning (suicide and self-harm)

First Level Hospital

Diagnosis and management of acute psychoses (mental health disorders)
Management of severe dependence and withdrawal (alcohol and illicit drug use)

Specialised Care

*Electroconvulsive therapy for severe or refractory depressio*n (mental health disorders)

DCP3 Disease Control Priorities

EMERGENCY COMPONENTS OF ESSENTIAL PACKAGES

Obstetric, Gynecologic, Reproductive Health and Family Planning

Child and Newborn Health

Injury

General Surgical

Mental, Neurological, and Substance Abuse Disorders

Cancer Care

Community Facility and Primary Health Centre
Hep B vaccination (including birth dose)

First Level Hospital
Emergency surgery for obstruction

DCP3 Disease Control Priorities

WHO EMERGENCY CARE SYSTEM FRAMEWORK

EMERGENCY CARE SYSTEM FRAMEWORK

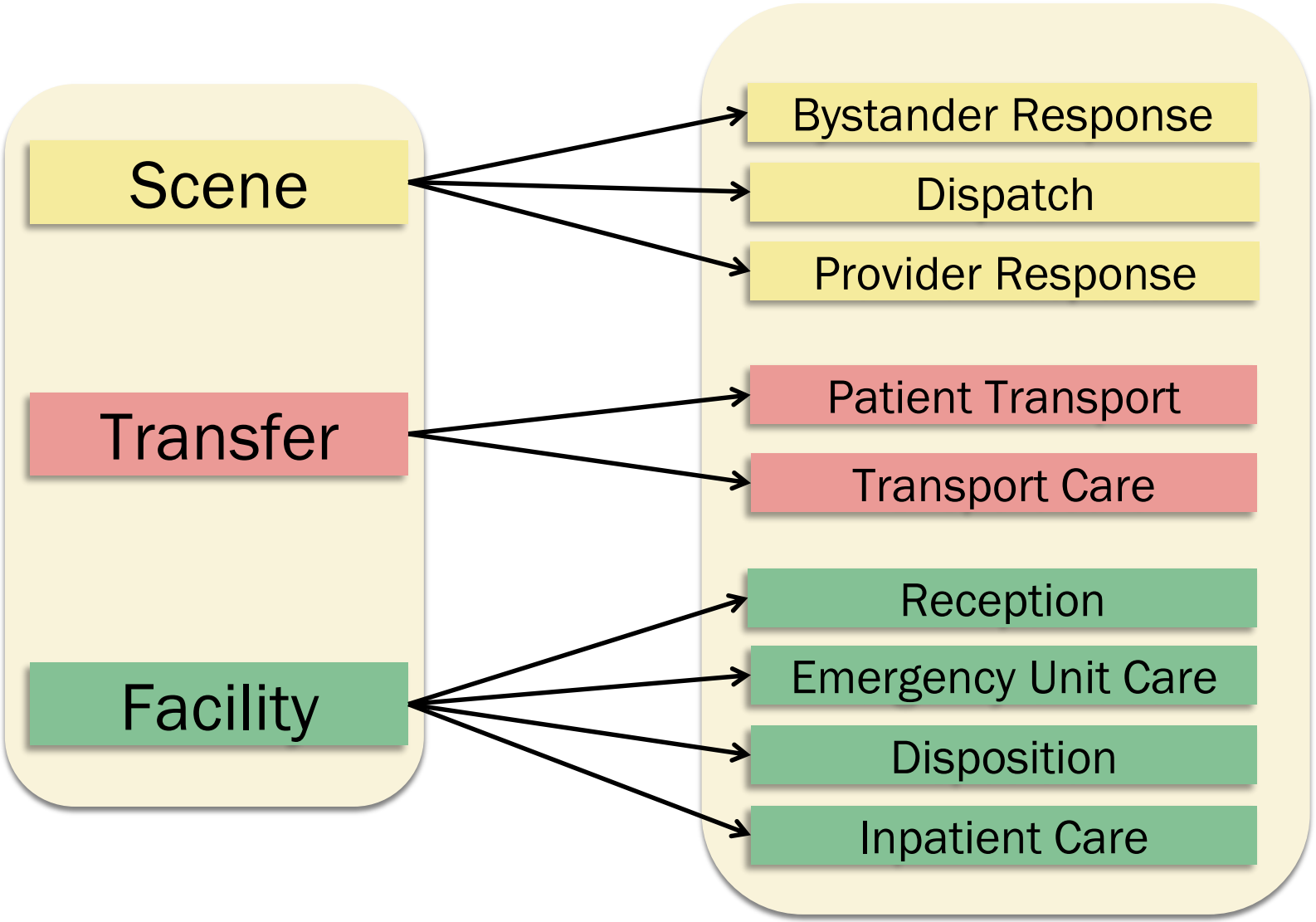
- **Document of consensus-based essential components of emergency care systems.**
- **Designed for ministries, policy makers, health system administrators, and general advocacy**
- **Facilitates the identification of system gaps to aid in priority setting.**

WHO EMERGENCY CARE SYSTEM FRAMEWORK

Site	Primary Function	Components		Human Resources & Training	Essential Medical Products, Technologies & Infrastructure	Information and Research	Leadership and Governance
SCENE	Bystander Response	System Activation		Bystander +/- community-based training (including first aid, education on system activation and care-seeking behaviour)	Universal access number or activation system; centralized call processing		Legislative mandate for universal activation of system; legislation regarding telephone company responsibility for UAN calls
			Patient protection				Laws on theft/assault of the injured
		Bystander Care	Limited assistance for immediate life threats		Basic lay provider kit of local materials		Training accreditation for lay providers
							Bystander Protection (Good Samaritan Laws)
	Dispatch	Instructions to bystanders	Information to aid patient	Dispatch operator	Communication technologies, including a form of centralized call processing; system should be redundant by design.	Data collection for performance metrics (time to call, time to dispatch, time to	Protocols, regulations and guidelines for dispatch (incl jurisdiction, remote care direction, destination triage, coordination of public and private ambulance services).
		Dispatch of personnel					
	Provider Response	Scene Control (managing hazards)	Patient and provider safety	Providers may include formally trained lay responder (eg EFAR, police); Professional responders (eg. Nurses, EMT, Paramedic, Doctor);	Basic pr		
		Scene Care	Initial assessment				
			Initial resuscitation & stabilization				
			Packaging of patient				
			Preliminary diagnoses				
		Field to Facility Communication		Field and facility based providers, technical experts	Commu field unit		
		Destination Triage					

Site	Primary Function	Components		Human Resources & Training	Essential Medical Products, Technologies & Infrastructure	Information and Research	Leadership and Governance
TRANSFER	Patient Transport		Transport patient	Driver, Technical fleet director	Vehicle (with ambulance functionality, space to give care)		Laws and regulation governing use of emergency vehicles
	Transport Care		Positioning (airway and injury protection)	Provider	Transport care kit	Clinical documentation (including chief complaint and diagnosis), process measures, performance metrics	Minimum standards for transport care
			Monitoring				
			Intervention (ABCD, OB delivery, pain control)				
FACILITY	Reception	Registration		Clerical Staff	Information system	Screening, demographics, chief complaint	Laws addressing access to emergency care (requirement to provide initial evaluation and management) regardless of ability to pay
		Screening			Case definitions, screening criteria		Regulation and protocols governing relationship between triage and registration
		Triage		Administrative or Provider	Basic evaluation kit	Process metrics (time flow); patient conformance with triage designations	Triage protocols
		Handover					Syndromic surveillance guidelines
	Emergency Unit Care	Initial Assessment & Resuscitation	Syndromic identification & ABCD interventions	Provider (doc, mid-level, independent nurse)	Basic evaluation and acuity based resuscitation (ABC) kits	Basic acuity info, process metrics (time to provider) Time to intervention, clinical record, early response to therapy, utilization data	Good practice and documentation guidelines. Standardised externally validated resuscitation guidelines
		Monitoring and Revaluation	Monitoring and recurrent revaluation	Provier, Allied Health Professional	Acuity-based monitoring kit	Disease timecourse and progression	Establishment of guidelines regarding care to be delivered at various levels of facility (i.e. trauma centers must have a surgeon in house, etc) XRSF designation
		Detailed Assessment	Clinical evaluation	Provider		LOS, time to dispo decision, time to consult	
		Diagnostic Studies		Technicians, Expert interpreter	Radiology and laboratory equipment, system for results reporting		
		Additional Therapeutics	Other intervention	Provider	Meds, IVF, procedural		

WHO EMERGENCY CARE SYSTEM FRAMEWORK



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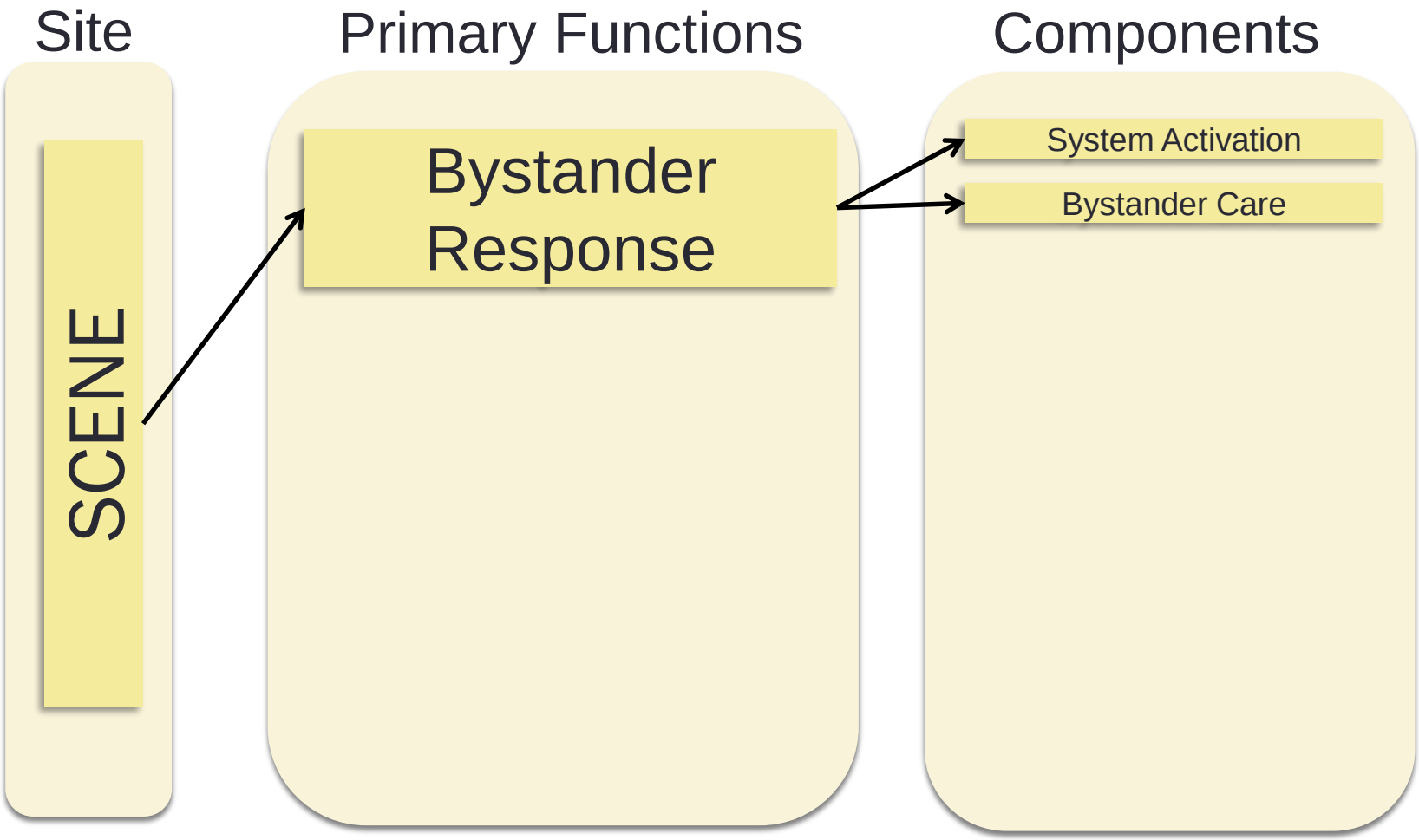

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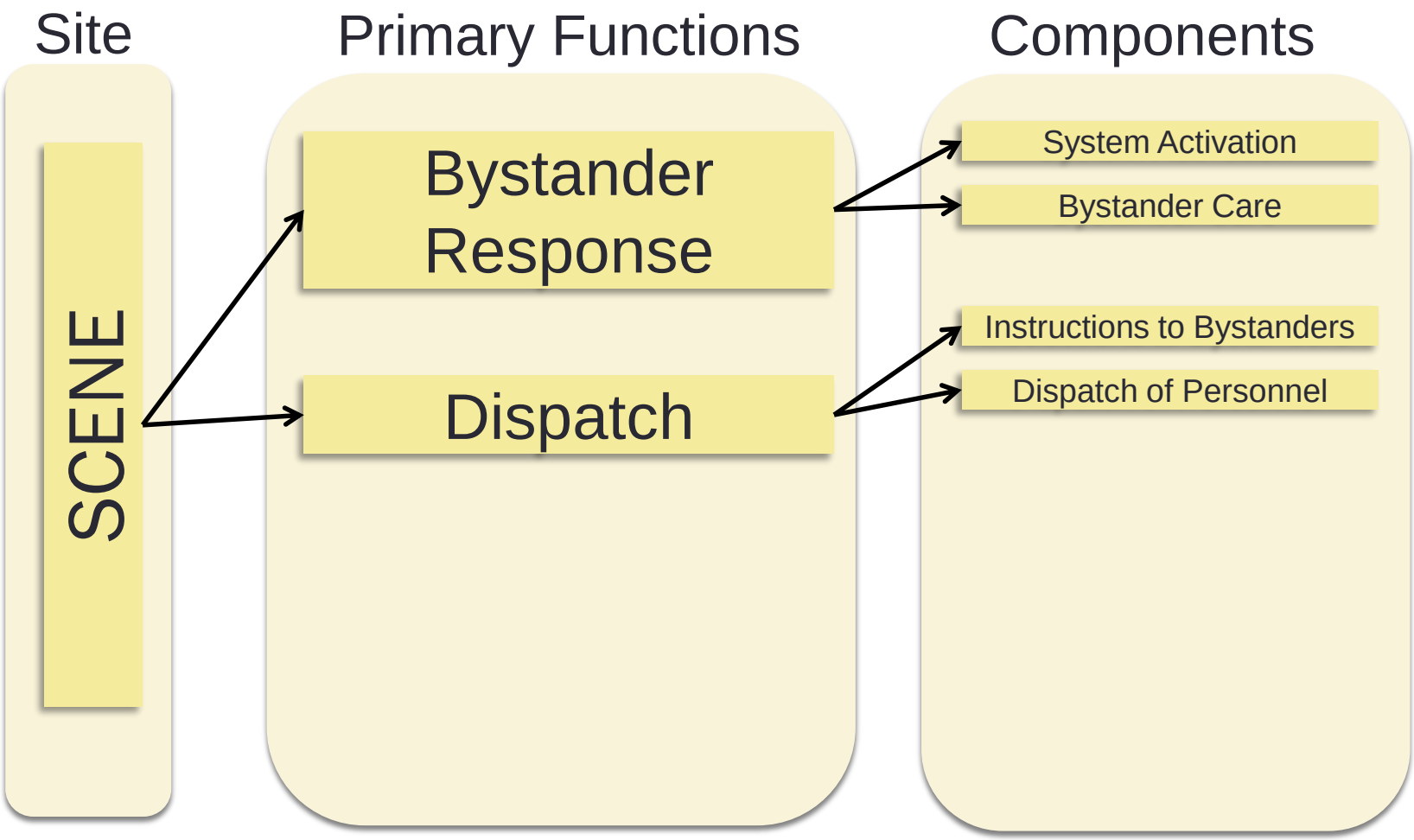

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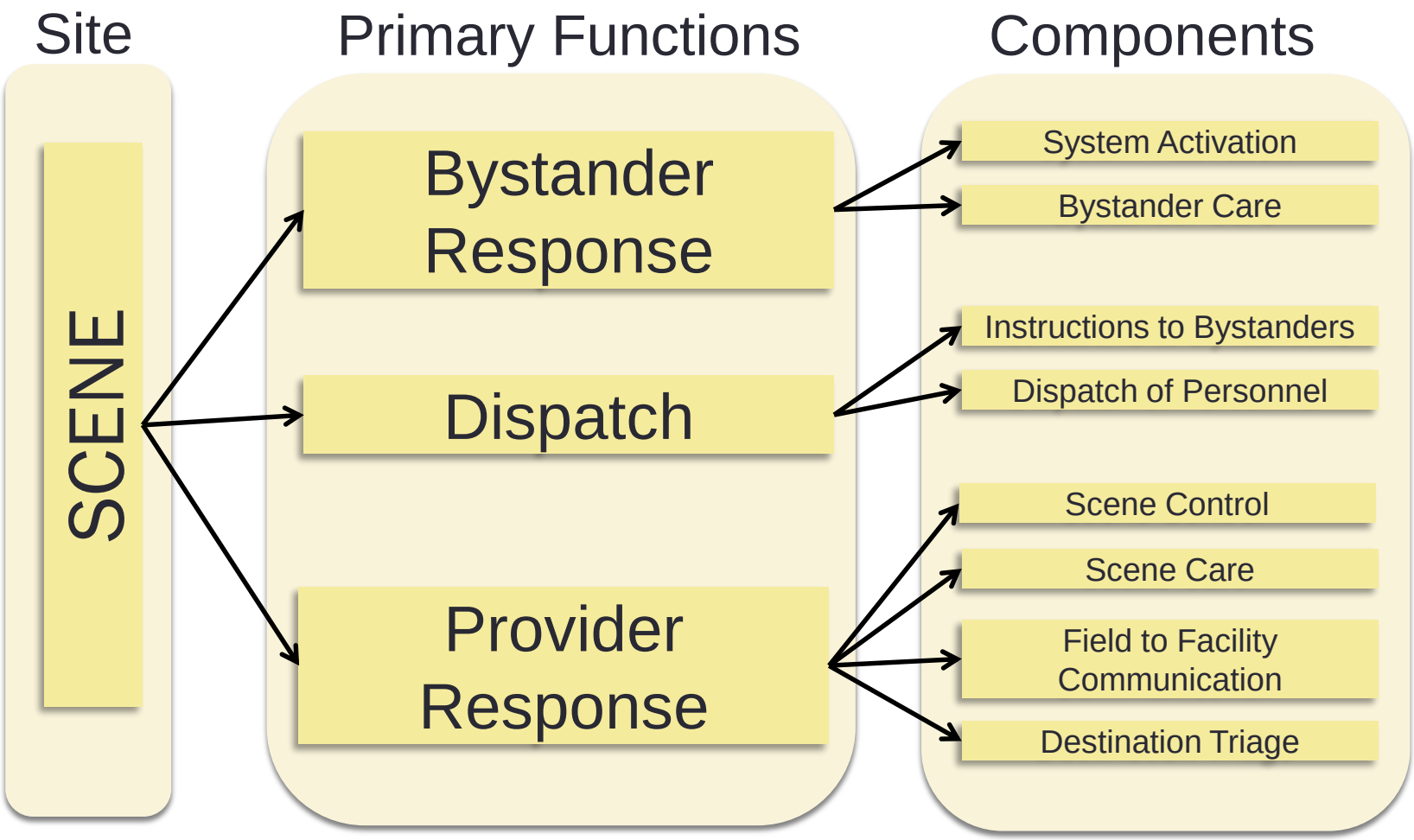

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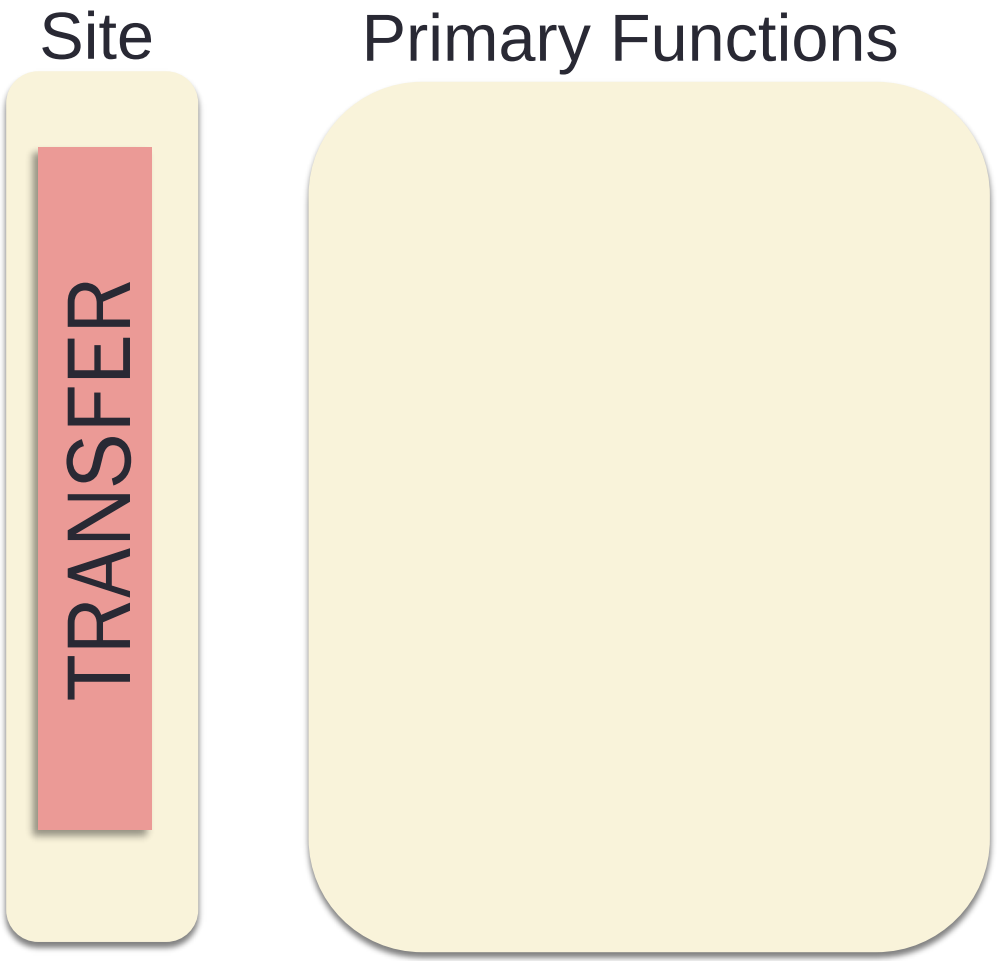

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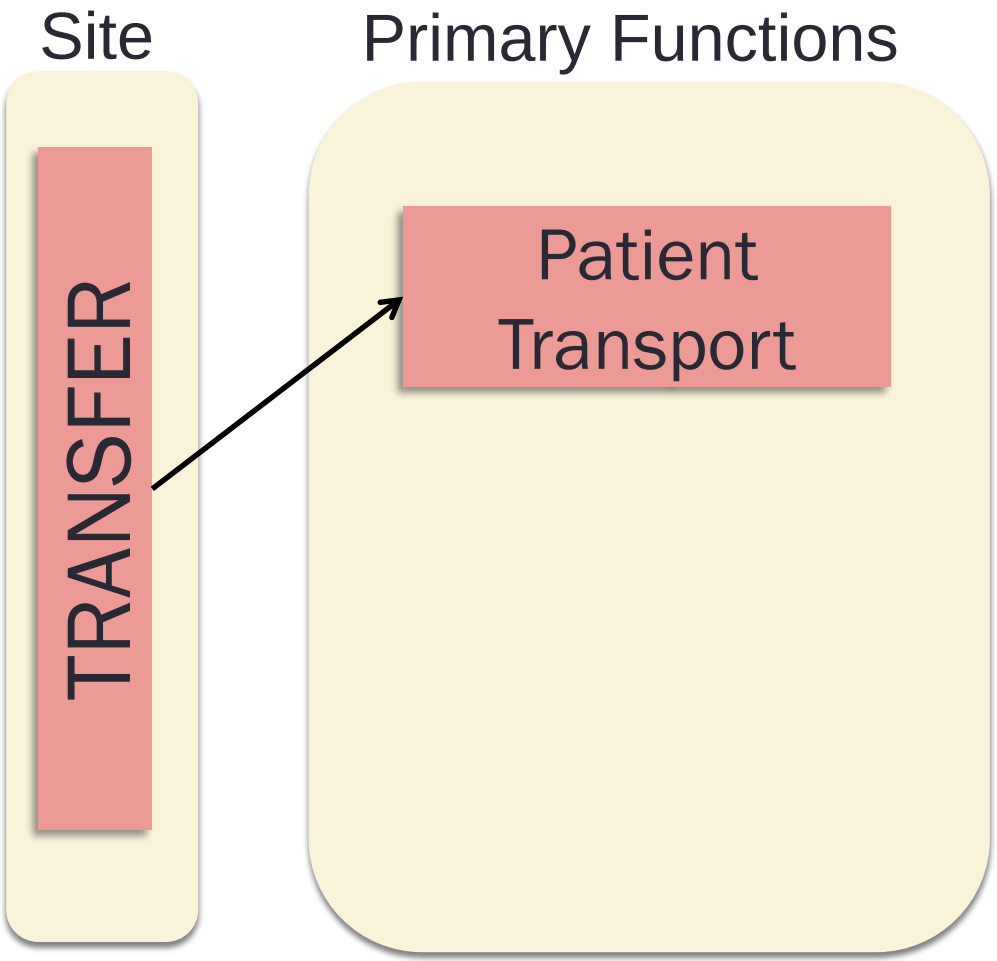

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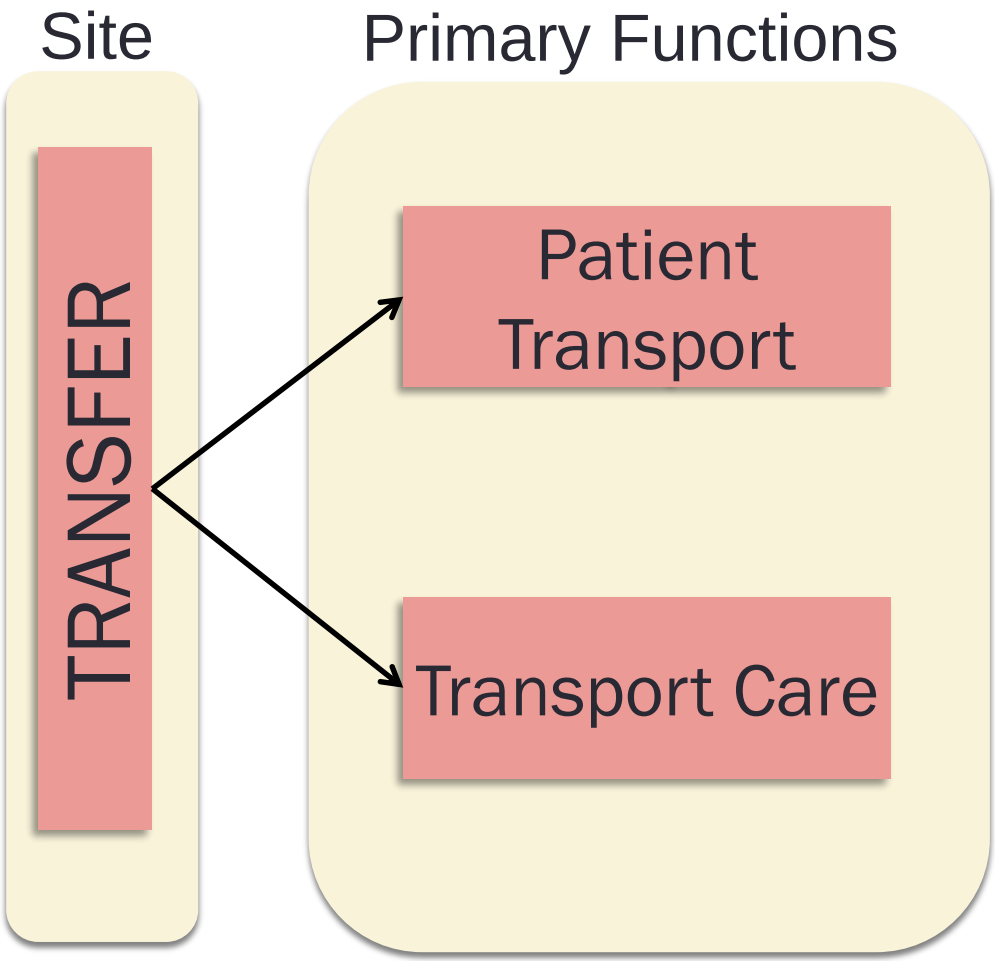

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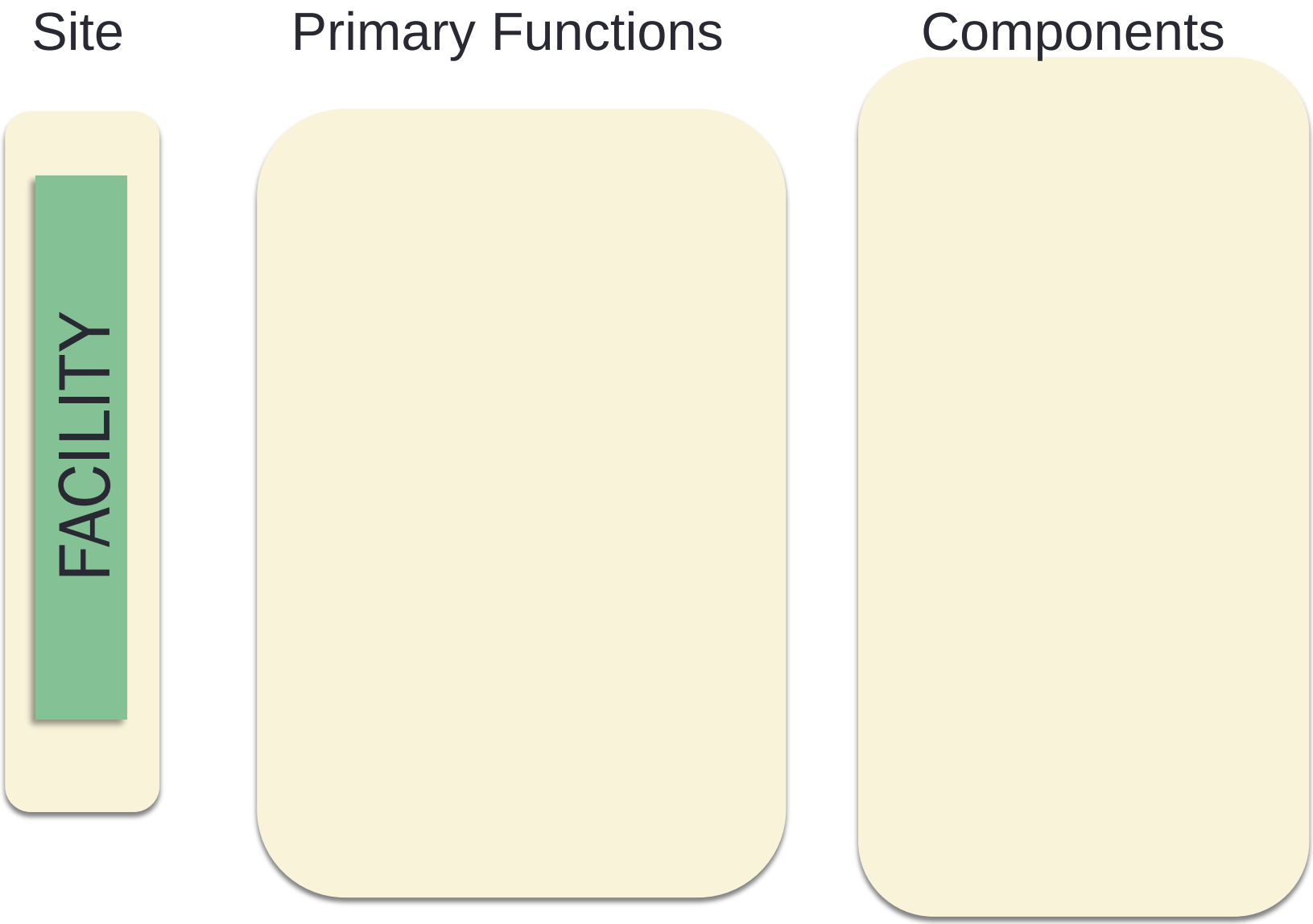

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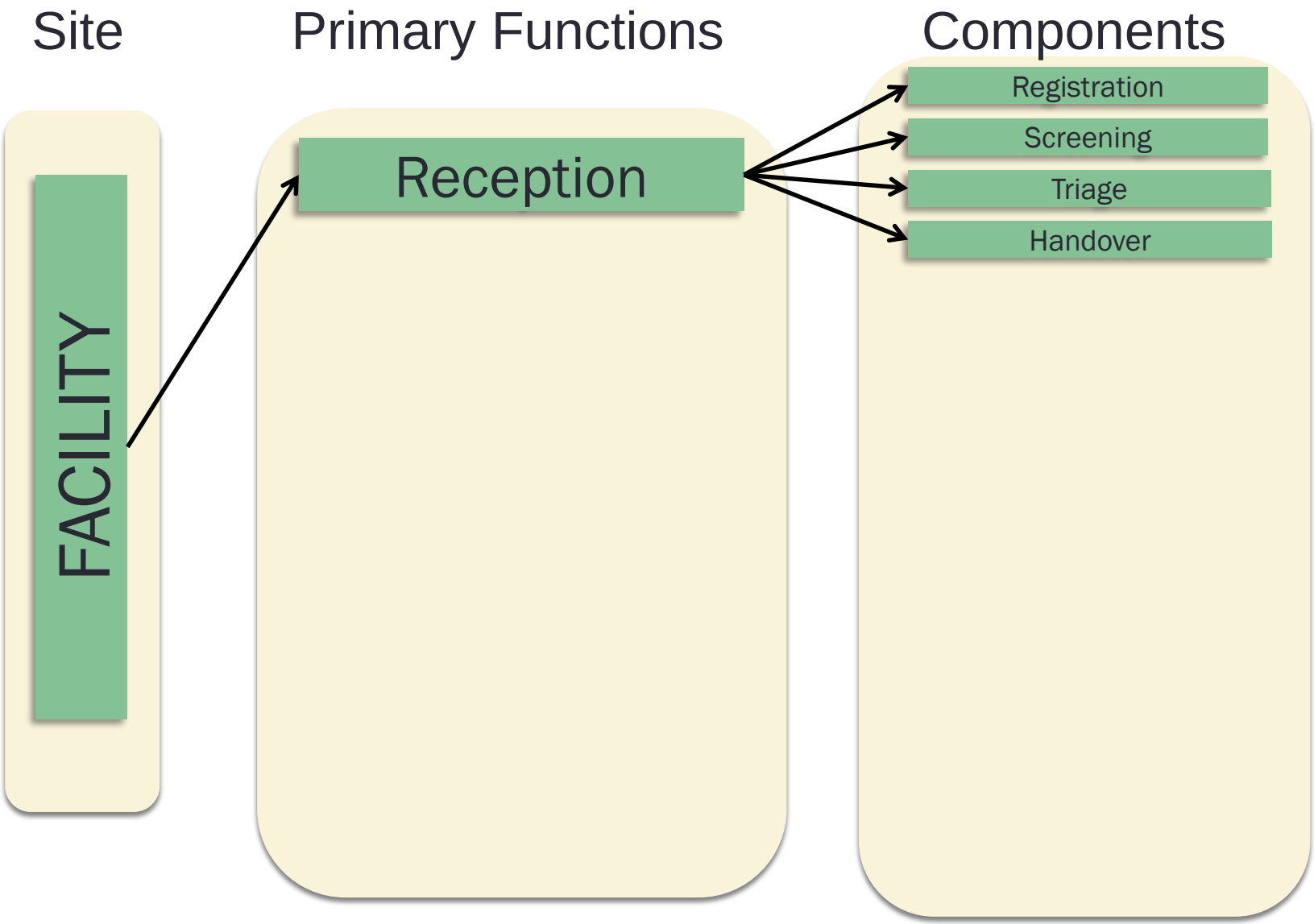

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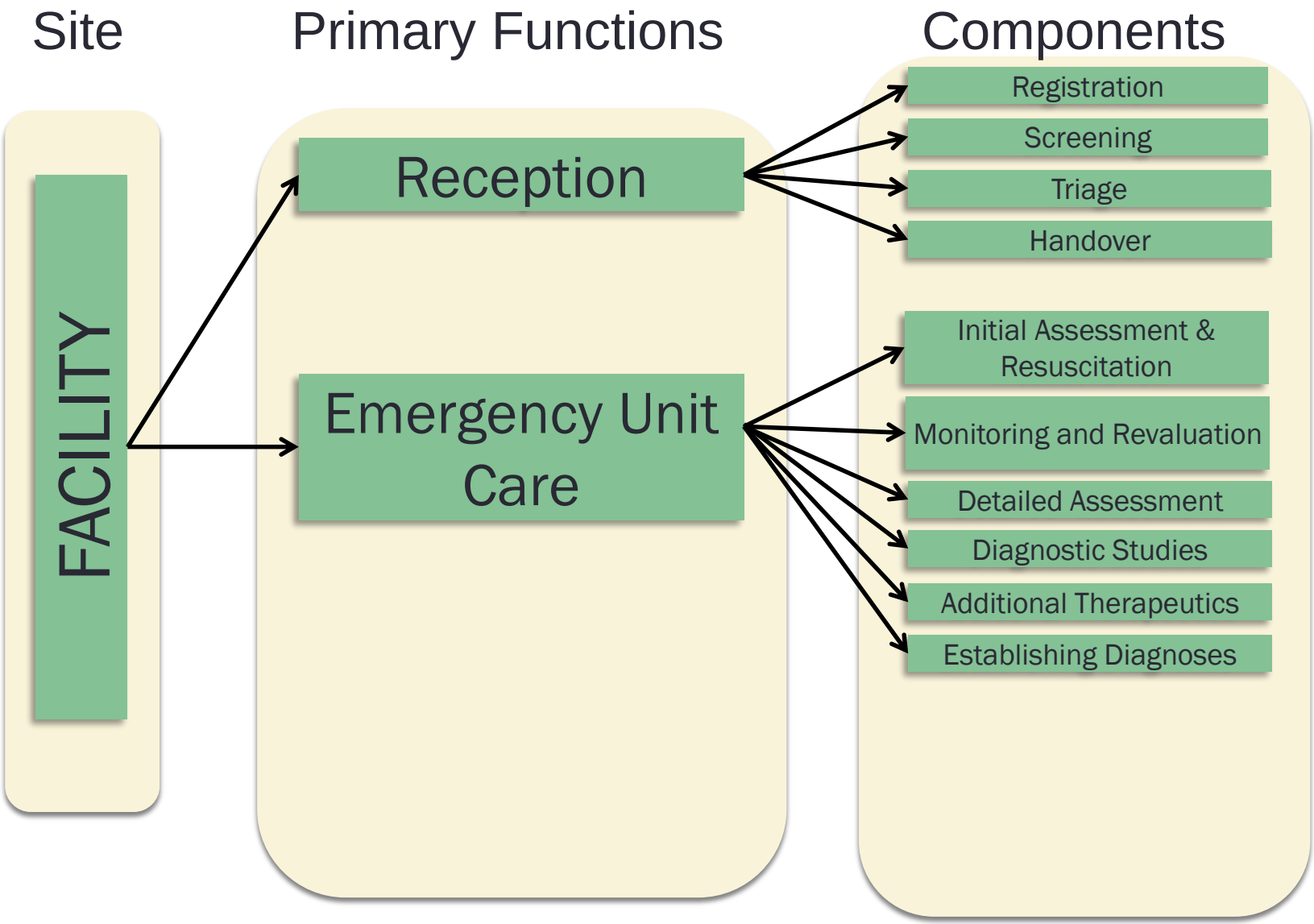

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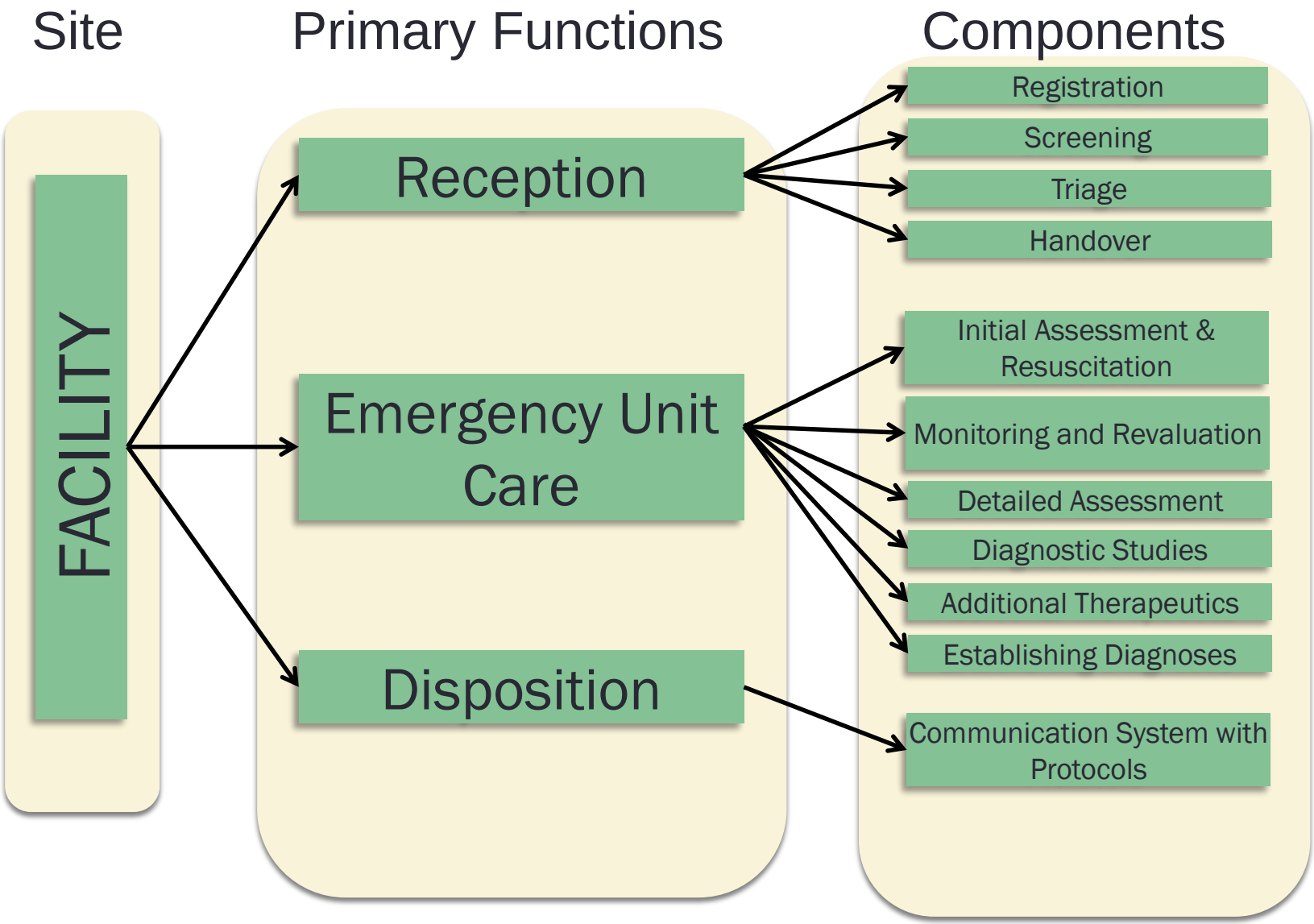

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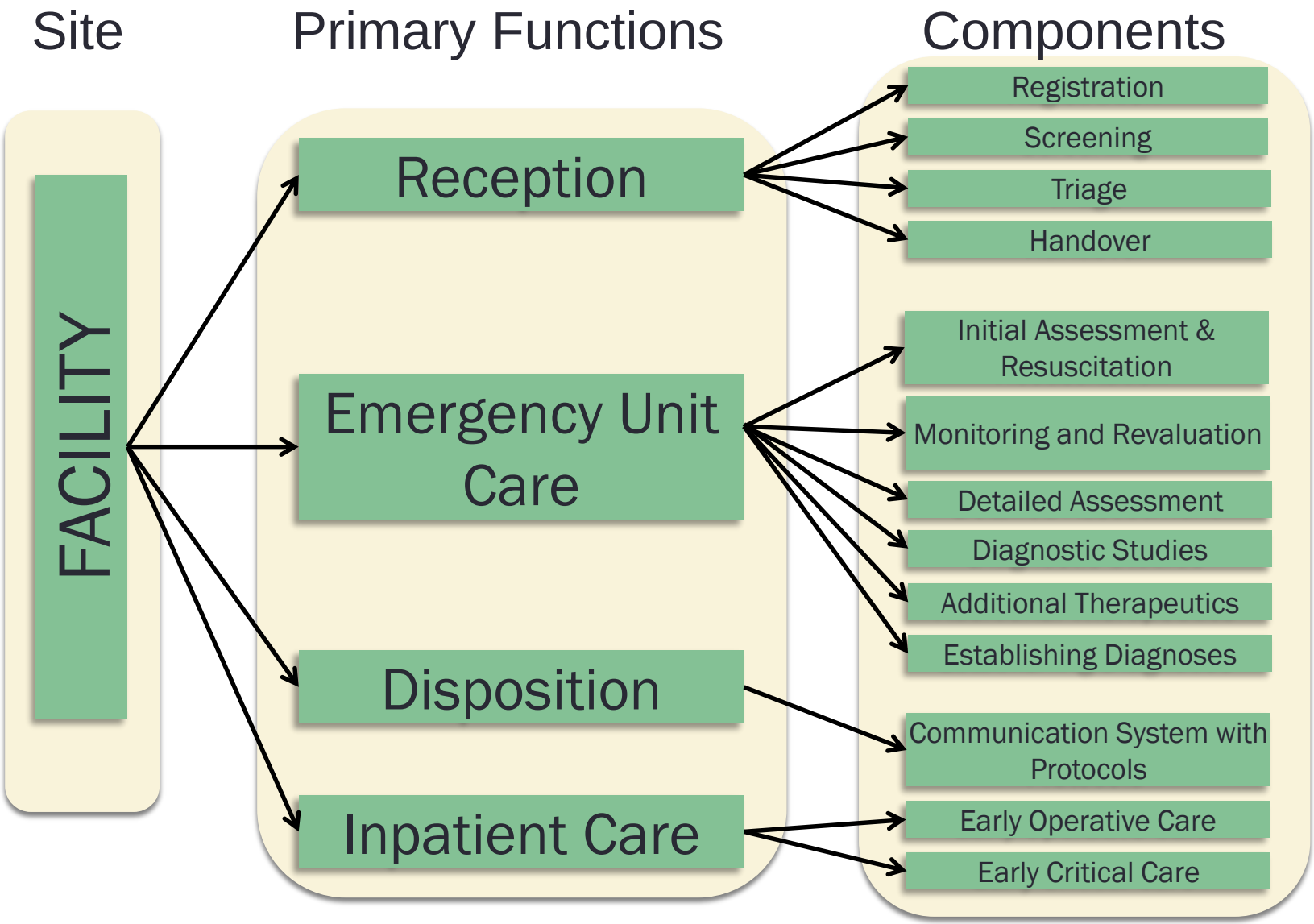

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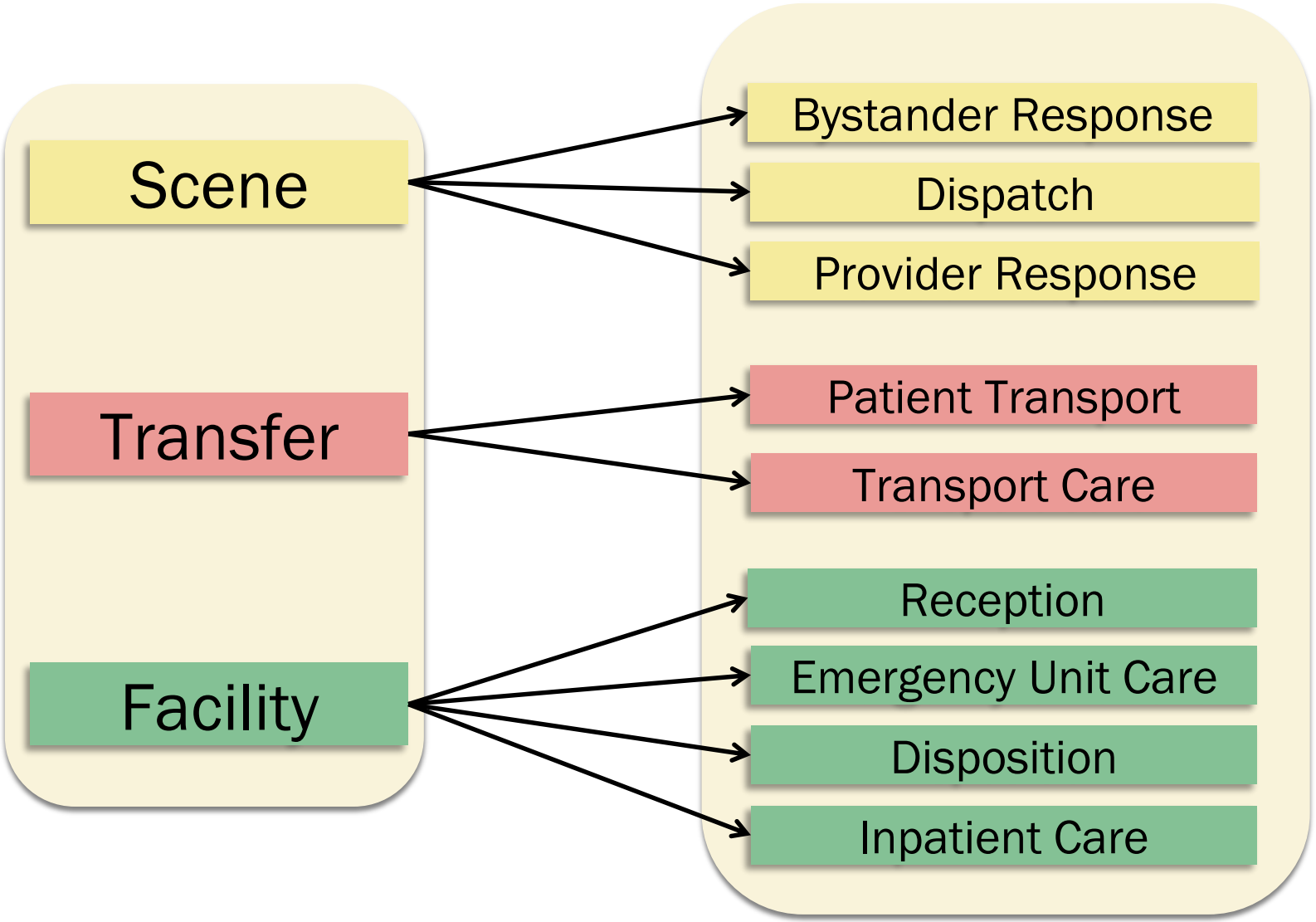

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		Diagnostic Studies		Technicians, Expert interpreter	Radiology and laboratory equipment, system for results reporting		
		Additional Therapeutics	Other intervention	Provider	Meds, IVF, procedural		

EMERGENCY CARE SYSTEM ASSESSMENT TOOL

EMERGENCY CARE SYSTEM ASSESSMENT TOOL

- **An instrument for internal or external assessment of national or sub-national emergency care systems.**
- **Survey structure in which answers represent progressive stages of system development**
- **Creates roadmap functionality to guide priority setting.**
- **Goal is to generate priority action plans**

* **8.12** **Is there an organized system for determining the right destination for injured patients?**

Choose one of the following answers

- ○ **[1]** There are no destination triage protocols or system. Decisions are made based on provider or patient preference.
- ○ **[2]** An advisory service (eg. staffed telephone) is available for advice regarding patient destination; however there are no protocols governing destination triage.
- ○ **[3]** Some protocols regulate destination triage, however these are not system-wide or reliably monitored. There is not a reliable back-up advisory system to provide clinical support where required.
- ○ **[4]** System-wide protocols regulate destination triage and are centrally monitored. However there is not a reliable back-up advisory system to provide clinical support where required.
- ○ **[5]** System-wide protocols regulate destination triage and are centrally monitored. There is a reliable back-up advisory system to provide clinical support where required.
- ○ **I don't know.**
- ○ **Cannot answer for another reason (explain):**

* **8.13** **What proportion of the population has effective coverage (see box) by a formal pre-hospital ambulance system?**

Note: Effective coverage refers to reliable access to timely on-scene emergency care followed by transport with a provider when needed.

Access to ambulance services implies geographic availability, but also includes functional availability (eg financial access).

Where private ambulance services exist, coverage estimate should be adjusted to take financial barriers into

Emergency unit staffing in first-level referral facilities:

First-level referral facilities *are the lowest level of facility that receives referrals. In many countries, these are district hospitals.*

An ***emergency unit*** *is any dedicated intake area for acutely ill and injured patients. This may be referred to as the Emergency Department/Room/Ward, Accident and Emergency, Casualty, etc.*

There are no dedicated emergency units or no providers with specific responsibility for emergency unit patients until they are admitted.	**1**
There are non-doctor staff that register and direct patients from the emergency unit to inpatient areas (the unit has a sorting function, but minimal care is provided).	**2**
Doctors from inpatient services have on-call responsibility to cover emergency unit patients, but are not assigned to be in the emergency unit.	**3**
Doctors from inpatient services are assigned to be in the emergency unit, rotating through for limited intervals (e.g. 1 month blocks).	**4**
There are non-rotating providers that permanently staff the emergency unit.	**5**
I don't know.	☐
Cannot answer for another reason (explain):	☐

WHO EMERGENCY CARE SYSTEM FRAMEWORK

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PREVENTION

PREHOSPITAL & TRANSPORT

TRAUMA

FACILITY-BASED CRITICAL CARE

EMERGENCY **CARE** SYSTEMS

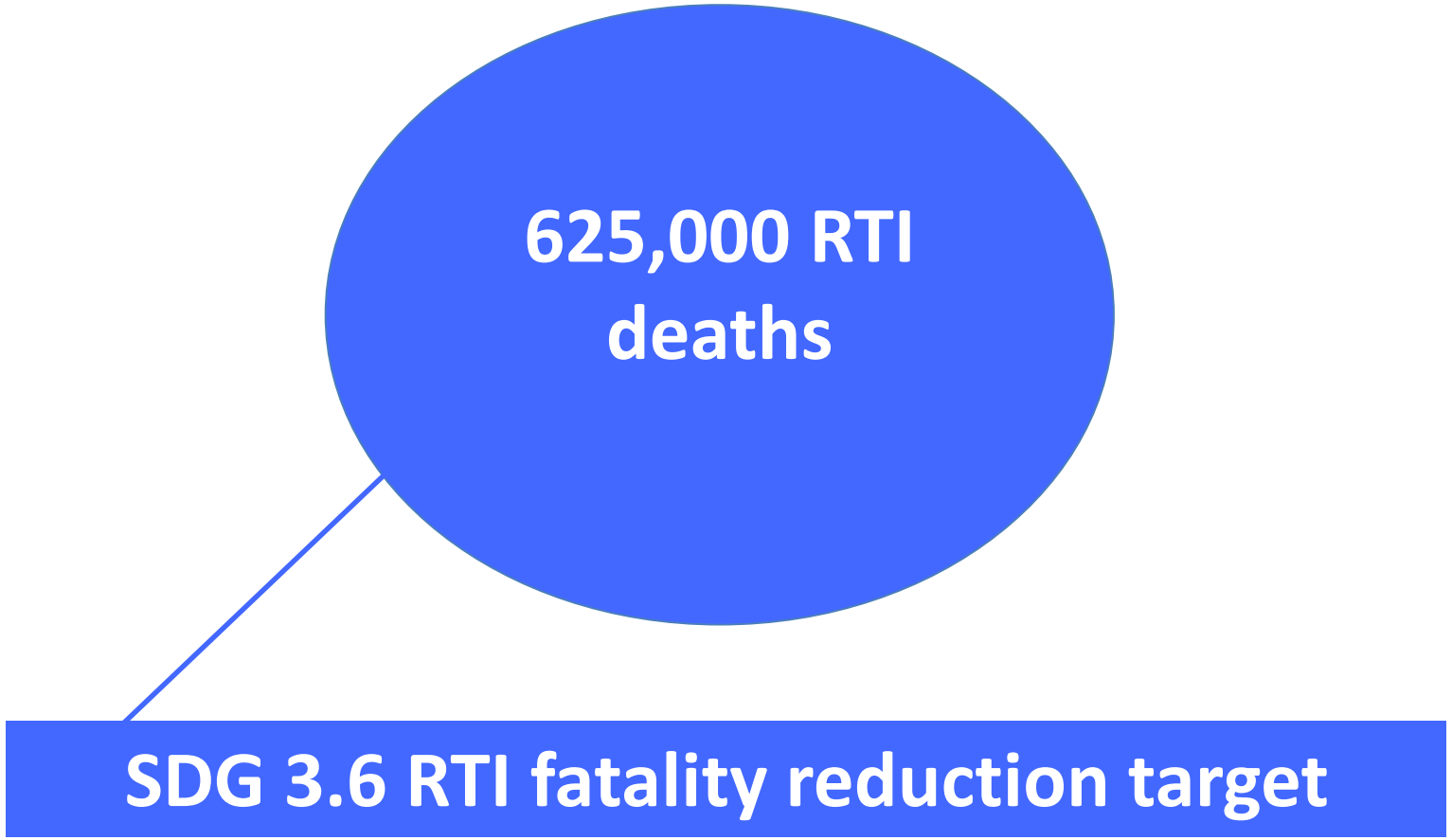
SYSTEMS

REHABILITATION

SUSTAINABLE DEVELOPMENT GOALS

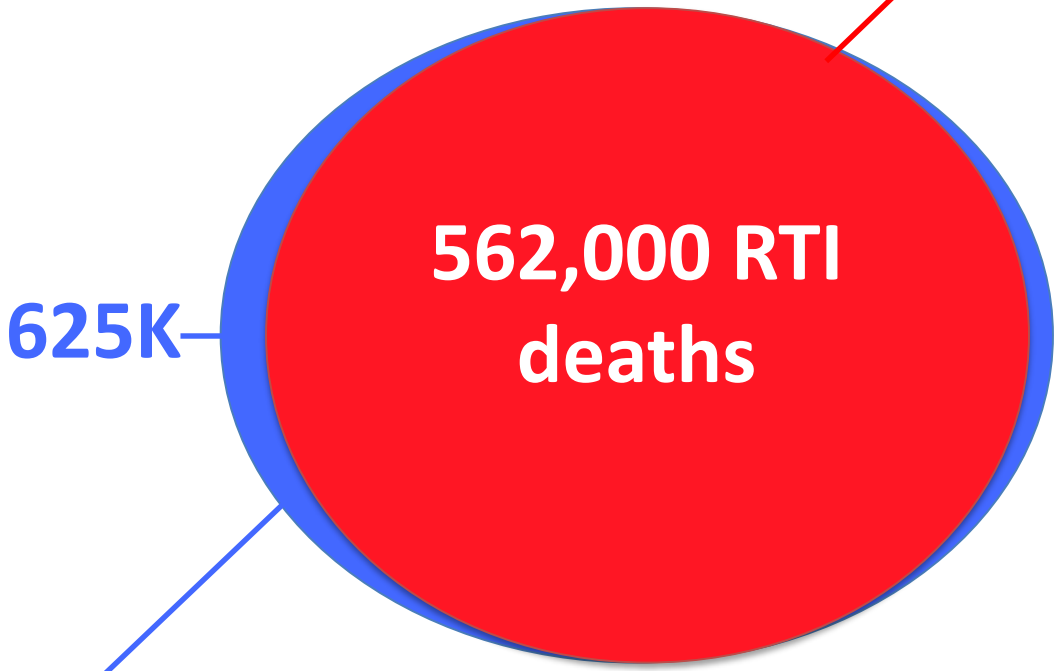
Ensure healthy lives and promote well-being for all at all ages

Make cities and human settlements inclusive, safe, resilient and sustainable



Mock et al. (2012) An Estimate of the Number of Lives that Could be Saved through Improvements in Trauma Care Globally. WJS

Lives potentially saved every year in LMIC by improvements in trauma care



SDG 3.6 RTI fatality reduction target

Mock et al. (2012) An Estimate of the Number of Lives that Could be Saved through Improvements in Trauma Care Globally. WJS

Emergency Care and SDG Targets

3.1: Reduce by three quarters, between 2015 and 2030, the maternal mortality ratio

Treatment for obstetric emergencies

3.2: Reduce by three quarters, between 2015 and 2030, the under-five mortality rate

Treatment for diarrhea and pneumonia

3.3: Reverse the incidence of malaria and other major diseases and ensure that deaths caused by these diseases are reduced by a half in 2030

Treatment of acute infections and sepsis

3.4: By 2030, reduce by one-third premature mortality from NCDs

Treatment of exacerbations of NCDs

3.5: Strengthen the treatment of substance abuse

Emergency unit care and harm reduction interventions

3.6: Halve the burden due to global road traffic crashes by halving the number of fatalities and serious injuries by 2030 compared to 2010.

Post-crash emergency care

3.8: Achieve universal health coverage including financial risk protection and access to quality essential healthcare services

Emergency care is an essential component of health care

11.5: By 2030, significant reduce the number of deaths and people affected caused by disasters

Disaster preparedness and response for resilient health systems

The WHO Emergency Care System Framework and associated assessment tool are designed to characterize system gaps, set planning and funding priorities, and establish monitoring and evaluation strategies for system strengthening and development.

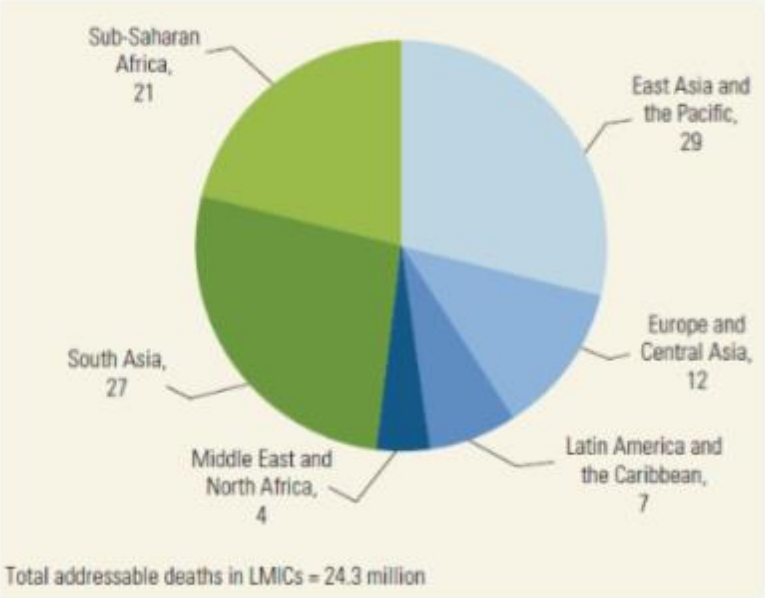
Emergency care system strengthening will be essential for increasing global capacity for the emergency procedures DCP essential packages at each level of the health system include.

Need to summarize and synthesize evidence of the effectiveness of emergency care interventions and provide comparative economic evaluation of policies to implement those interventions.

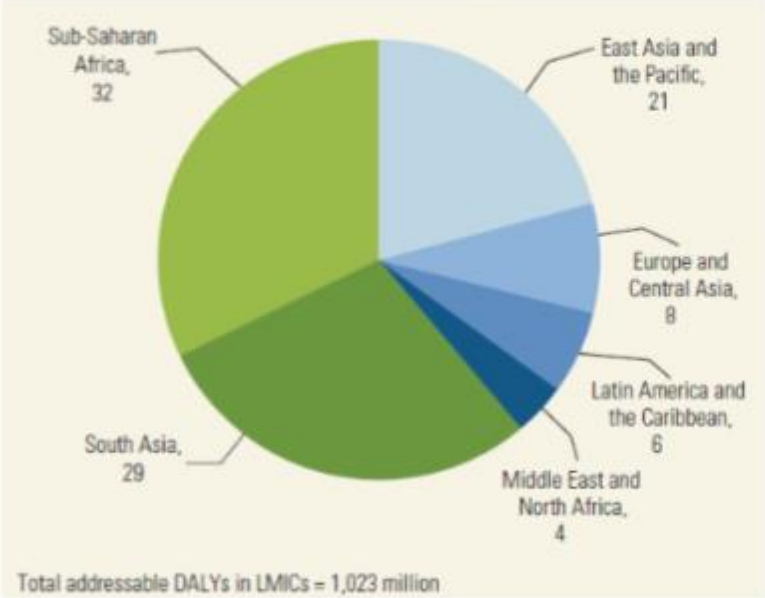
PRE-HOSPITAL CARE

Figure 1 Burden Addressable by Prehospital Care

Regional Distribution of Deaths Addressable by Prehospital and Emergency Care in LMICs



Regional Distribution of DALYs Potentially Addressable by Prehospital and Emergency Care in LMIC



**Note: All figures are percentages. These graphs include all deaths and DALYs avertable by prehospital care, not just those from road traffic injuries.*

DCP3 Disease Control Priorities