



# KENYA EMERGENCY SUPPLY CHAIN PREPAREDNESS AND RESPONSE: A One Health Approach to Disease Outbreaks

**USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM**

Procurement and Supply Management

Afya Ugavi



**USAID**  
FROM THE AMERICAN PEOPLE

**USAID Global Health Supply Chain Program – Procurement and Supply Management**

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# Introduction

- Global Health Security Agenda (GHSA) is a partnership of international organizations and non-governmental stakeholders
- **Aim:** Build countries' capacity towards a world safe and secure from infectious disease threats
- **Approach:** to strengthen both the global and individual nations' capacity to prevent, detect, and respond to health threats
- **Current Kenya Situation**
  - Kenya subscribes to GHSA goal of a secure world and in response has developed the Kenya GHSA 5-Year Roadmap 2015 – 2020 and established an IHR national Focal Point.
  - One of the weaknesses revealed in response by the Joint External Evaluation (JEE) of IHR Core Capacities is in deployment of medical countermeasures (MCMs) and medical personnel during public health emergencies.
  - Kenya scored a low 1 and JEE recommends prioritization to improve efficiencies in response.

# Objectives and Approach

- **One Health lens:** Focusing on public health emergencies caused by diseases with human, animal, and environmental factors. EOC/ESC team comprised of Officers from Ministries of Health, Agriculture, Environment and Wildlife.
- Afya Ugavi and EOC/ESC team worked collaboratively to customize the ESC framework (previously known as playbook).
- **Goal:** Ensure there is a national framework for sending and receiving medical & non-medical countermeasures during health emergencies at the country level
- **Partners:** Government-appointed departments and units, development partners, and international and local NGOs which currently give support in short- or long-term emergencies

# WHAT IS EMERGENCY SUPPLY CHAIN PREPAREDNESS AND WHY DOES IT MATTER?



**Definition of emergency supply chain preparedness:** Establish a system ahead of an emergency to manage all the commodities necessary to respond to an outbreak and ensure they get to the point of care as efficiently as possible.

## WHY IS EMERGENCY SUPPLY CHAIN IMPORTANT?



### Emergencies present unique supply chain challenges



Demand is **unpredictable** and requires timely delivery to save lives



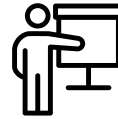
Emergencies put a **strain on existing logistics systems**



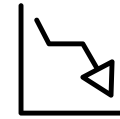
Resources required to respond to emergencies are **complex and expensive**



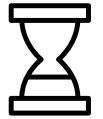
### Investments in preparedness pay off



Preparedness saves lives by **getting essential medicines to the front lines rapidly**



Money invested in preparedness reduces the amount of response funds by **2x**



Time invested in preparedness speeds response **by over a week on average**

SOURCE: UNICEF/WFP Return on Investment for Emergency Preparedness Study, January 2015. Emergency management logistics must become emergency supply chain management, Young and Peterson.

# An emergency supply chain is organized around three components

TOPICS

OUTPUT

1

## People and processes

**What are the structures that enable the ESC to function?**

- Governance and organizational structure
- Financing
- Triggers

**Clear governance and processes to run the emergency supply chain**

2

## Commodity planning

**What commodities will the ESC be responsible for, and how will it handle them?**

- Commodity forecasting
  - Procurement and sourcing
- Prepositioning/Stockpiling

**Stockpiled commodities based on an up-to-date hazard assessment**

3

## Transport and logistics

**How will the commodities get to where they need to go?**

- Warehousing and storage
- Transport and waste management
  - Data visibility

**Storage and transportation arrangements in place to move commodities**

# Overview of Kenya Emergency Supply Chain Framework

The Emergency Supply Chain Framework consists of:

1. A Best Practices Report
2. An Emergency Supply Chain Playbook (Guide)
  - General Playbook
  - Country-specific Customized Playbook
3. A Simulation Exercise



# Customization of Emergency Supply Chain Framework to the Kenyan Context

## Customization of the three modules of the Emergency Supply Chain Playbook

Using One Health Approach, customization of ESC framework was completed

Through a series of meetings, the ESC Core customized the generic framework

- **People and processes** – Governance, Org. Structure, Triggers, Financing
- **Commodity planning** – Forecasting, Procurement and sourcing, Stockpiling
- **Transport and Logistics** – Mapping and determining capacity, including storage space and waste disposal sites



# Disease prioritization matrix

- Lowest risk
- High risk, ESC may prepare
- Moderate risk
- Very high risk, ESC must prepare

<b>Likelihood</b>	Almost certain		Dengue Brucellosis	Measles Polio	Cholera	RVF
	Highly likely			Chikungunya		Ebola/ PHEIUE
	Likely			Leishmaniasis Typhoid Shigellosis SARS/influenza	MERS, CCHF Lassa, Malaria West Nile Marburg	Yellow fever Meningococcal meningitis
	Unlikely			Trypanosomiasis	Anthrax	HPAI Rabies
	Very unlikely			Plague		
		Minimal	Minor	Moderate	Major	Severe
		<b>Severity</b>				



# Relevant Triggers Per Disease Codified Based on Six General Principles

- Occurrence of one case or a positive environmental sample of a disease targeted for global elimination e.g. polio
- Occurrence of one case of a highly pathogenic disease of international and national concern e.g. Ebola, Marburg, MERS Cov
- Occurrence of one case of a highly pathogenic disease in the region
- Spread of disease from one county to neighboring counties
- An outbreak of disease within internally displaced persons
- National government is aware that the county is overwhelmed i.e. disease is not controlled within a reasonable duration



## Sample triggers

### Polio

- 1 confirmed case
- 1 confirmed environmental sample

### Ebola

- 1 confirmed case
- Country is at high risk of importing a case from another country
- 1 suspected case

### Typhoid fever

- 5 cases in a week in one county
- Reports of disease from > 1 county

### Brucellosis (in animals)

- 50 confirmed cases in dairy sector

# Types of Outbreaks and Potential Implications for Country-level Emergency Supply Chain Managers

	Description	Implications for country-level ESC officers
<b>Localized outbreak</b>	<ul style="list-style-type: none"><li>▪ Outbreak starts and is contained within national borders</li></ul>	<ul style="list-style-type: none"><li>▪ Coordinate with international partners early and get their expert advice, particularly on quantity forecasting</li><li>▪ Make use of regional stockpiles of commodities</li></ul>
<b>Regional outbreak</b>	<ul style="list-style-type: none"><li>▪ Outbreak starts in a neighboring country</li></ul>	<ul style="list-style-type: none"><li>▪ Monitor progression of disease and prepare emergency supply chains even if disease has not hit your border yet</li><li>▪ Coordinate with neighboring governments and international organizations</li></ul>
<b>Widespread pandemic</b>	<ul style="list-style-type: none"><li>▪ Widespread pandemic affecting multiple regions of the world</li></ul>	<ul style="list-style-type: none"><li>▪ Global organizations will likely be stretched thin, potentially with limited ability to support your country</li><li>▪ Suppliers of key commodities will likely be out of stock; you should coordinate with suppliers directly to obtain what commodities you can</li></ul>

# Sample ESC Databases

## Commodities database - human

This tab is based on the commodity lists on the Response Job Aids. User should input specifications (in yellow columns only) for each necessary commodity based on priority disease list. The quantity required for an outbreak will be automatically calculated. To add additional commodities, input manually at the bottom where "New Commodity" is written, or replace non-essential commodities on this worksheet. Consumption per cases for each disease must be added for New Commodities as well.

RefNum	Main Category	Sub Category	Item Names	Selected specification description	Stockpile (1/0)	Largest quantity required	Response scenario
317	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Midazolam 5mg/ml injection		0	100	0
318	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Metoclopramide injection 5mg/mL (2mL amp)		0	100	5
319	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Metoclopramide oral liquid 5mg/5mL		0	100	5
320	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Metoclopramide tablet 10mg		0	100	5
321	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Nifurtimox tablet 30mg		0	200	0
322	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Oral Rehydration Salts (ORS) PFOL (to make 500mL) Sachet (WHO low-osmolality formula)		0	8000	3000
323	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	ORS + Zinc sulphate Co-pack (4 sachets + 10 tablets) 500mL sachets (dispersible)		0	8000	3000
324	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Oseteltamivir capsule 75 mg		0	8000	0
325	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Oxygen gas		0	6520	0
326	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Paracetamol oral liquid 125mg/5mL		0	12800	1000
327	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Paracetamol suppository 125mg		0	10000	1000
328	Pharmaceuticals/Vaccines/Anti-Septics/Disinfectants	Pharmaceuticals	Paracetamol tablet (scored) 500mg		0	19200	1000

# Procurement worksheet - animal

This tab serves as a database to store all procurement information on suppliers for necessary commodities. User can compare capacity to Response Scenario needs. Make sure any new commodities are inputted

## Commodity list and corresponding suppliers

				Supplier 1				
	Item Names	Necessary quant for outbreak response (based on response scenario)	Cost	Name	Location (Address)	Unit of Measure	Capacity (Number of units)	Cost per unit (KES)
	<b>Animal health</b>							
1	Jembes/hoes	6000	4,500,000.00	Mount Royal Ltd	Nairobi	No.	15	KES 750.00
2	Shovels	6000	4,200,000.00	Mount Royal Ltd	Nairobi	No.	30	KES 700.00
3	Vacutainer, 7ml with EDTA/Heparin	7500	5,250,000.00	Serinda Agencies Ltd	Kikuyu			
4	Universal bottle, 20ml	1300	-	Serinda Agencies Ltd	Kikuyu			
5	Vacutainer needle	7500	-	Plasima Trading Co.	Nairobi			
6	Vacutainer needle holder	50	129,300.00	KEMSA	Nairobi	Pack of 1000S	50	KES 2,586.00
7	Microscope slides	2500	22,500.00	Cathan Logistics Supplier	Nairobi			
8	First Aid kit	2500	22,500,000.00	Mount Royal Ltd	Nairobi	Kits	25	KES 9,000.00
9	GPS receivers and batteries	2500	75,000,000.00	Albsym Enterprises	Nairobi	No.	20	KES 30,000.00
10	Dry ice	1000	500,000.00	Carbacid Ltd	Nairobi	Kgs	1000	KES 500.00
11	Asphyxiation bags	1000	20,000,000.00	Kistar Enterprises	Nairobi	Packs of 100	100	KES 20,000.00
12	Tarpaulins and tool kit	1000	6,000,000.00		Nairobi	Sheets	50	KES 6,000.00
13	Mobile foot baths (Baby swimming pool)	1000	2,000,000.00	Mount Royal Ltd	Nairobi	No.	20	KES 2,000.00
14	Barbed wire	1000	4,500,000.00	Kistar Enterprises	Nairobi	25 Kg rolls	50	KES 4,500.00
15	Fencing poles	20000	12,000,000.00	Mount Royal Ltd	Nairobi	No.	100	KES 600.00
16	Cordon tape	100	200,000.00	Amtran Supplies	Nairobi	Rolls of 500 metres	500	KES 2,000.00
17	Burdizzo	1000	10,000,000.00	Javi Services	Karatina	No.	24	KES 10,000.00

# Transport Options Database

This tab serves as a database to store all potential transport options and compare to Response Scenario needs

	Capacity Gap	
	Regular	Cold Chain
Transport Required	2,308	115.4
Existing Government and Partner Capacity	26231.5	100
Gap Between Total Transport Capacity and Required	-23923.5	15.4

Estimated % of total storage that is CC	5%
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Provider Type	Name	Vehicle type	POC (vehicle type)	POC (contact information)	Geography	Unit type	# Vehicles	Volume (per vehicle)	Cold Chain?	Max weight capacity (kg)	Accessible Terrain	Usable during response?	Total usable capacity (Standard)	Total usable capacity (CC)	Assumed cost (% of commodity value)
NGO	Kenya Redcross	Truck	Abbas Gullet	<a href="mailto:gullet.abbas@redcross.co.ke">gullet.abbas@redcross.co.ke</a>	National	kilometers	5	13,000	N	13,000	Road	Y	13000	0	5%
NGO	Kenya Redcross	Land Cruisers (Light Vehicles)	Abbas Gullet	<a href="mailto:gullet.abbas@redcross.co.ke">gullet.abbas@redcross.co.ke</a>	National	kilometers	15	13,000	N	13,000	Road	Y	13000	0	5%
3PL	KEMSA	Truck	Ignatius Kaburu	<a href="mailto:ignatius.kaburu@kemsa.co.ke">ignatius.kaburu@kemsa.co.ke</a>	Regional	Weight/Distance				40	Road	Y	40		5%
3PL	KEMSA	Truck	Ignatius Kaburu	<a href="mailto:ignatius.kaburu@kemsa.co.ke">ignatius.kaburu@kemsa.co.ke</a>	Regional	weight/distance			N	40	Road	Y	40	0	5%
3PL	KEMSA	Truck	Ignatius Kaburu	<a href="mailto:ignatius.kaburu@kemsa.co.ke">ignatius.kaburu@kemsa.co.ke</a>	Regional	weight/distance			N	40	Road	Y	40	0	5%
3PL	KEMSA	Truck	Ignatius Kaburu	<a href="mailto:ignatius.kaburu@kemsa.co.ke">ignatius.kaburu@kemsa.co.ke</a>	National	weight/distance			Y	10	Road	Y	10	10	5%
3PL	KEMSA	Truck	Ignatius Kaburu	<a href="mailto:ignatius.kaburu@kemsa.co.ke">ignatius.kaburu@kemsa.co.ke</a>	National	weight/distance			N	2	Road	Y	1.5	0	5%
KEMSA	KEMSA	Truck	Ignatius Kaburu	<a href="mailto:ignatius.kaburu@kemsa.co.ke">ignatius.kaburu@kemsa.co.ke</a>	National	weight/distance			N	10	Road	Y	10	0	5%
3PL	MEDS	Truck	Dr. Jane Masiga	<a href="mailto:jmasiga@meds.or.ke">jmasiga@meds.or.ke</a>	National	weight/distance	8		Y	80	Road	Y	80	80	5%
3PL	MEDS	Truck	Dr. Jane Masiga	<a href="mailto:jmasiga@meds.or.ke">jmasiga@meds.or.ke</a>	National	weight/distance	2		Y	10	Road	Y	10	10	5%
3PL	MEDS	Plane	Dr. Jane Masiga	<a href="mailto:jmasiga@meds.or.ke">jmasiga@meds.or.ke</a>	Regional	weight/distance			Y		Air	Y			5%
	UNICEF														
	MSF														
	UN														
	Kenya Army														
	AMREF														

# Waste Disposal Site Database

This tab serves as a database to store all potential Waste Disposal options

Site Name	POC (Name)	POC (contact information)	tonnage/day	Cost (KES)	Coordinates	Region	Types of Waste Treated
Garissa PGH	Dr. Zeinab A.					North Eastern	hazardous
Biosafety			10,000			Kajiado	non-hazardous
Envirosafe Limited	Edwin Owino	<a href="mailto:edowino@live.co.uk">edowino@live.co.uk</a>	10			Kajiado	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Nairobi	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Garissa	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Kericho	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Nakuru	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Eldoret	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Karatina	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Mariakani	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Witu	hazardous; non-hazardous
Directorate of Veterinary Services	DVS	<a href="mailto:infodvs@kilimo.go.ke">infodvs@kilimo.go.ke</a>				Ukunda	hazardous; non-hazardous
Central Veterinary Lab						A	hazardous
Kenya Clayworks							
MTRH							
KNH?							
Nyeri PGH							
Coast PGH							
Embu PGH							
Jaramogi Oginga Odinga TRH							
Nakuru PGH							

# Simulation Exercises to Test Supply Chain Preparedness for Emergency Outbreaks

- **A simulation exercise to test the framework undertaken**
  - Two day simulation exercises
  - Three disease scenarios
    - **Ebola in a neighboring country**
    - **Anthrax outbreak in the wild**
    - **Global Influenza pandemic**
- **Documented lessons learned and updated the ESC framework**
  - Lessons learned were incorporated in the ESC framework

## Best practice in communication and coordination reinforced through simulation exercises

### Pre-emergency preparedness

- Map all stakeholders and define roles
- Collect and distribute contact information of all ESC stakeholders and international partners
- Hold monthly coordination meetings with country government ESC managers and international partners
- Set up email and/or SMS-based listserv for broader stakeholder group
- Coordinate to manage stockpiles

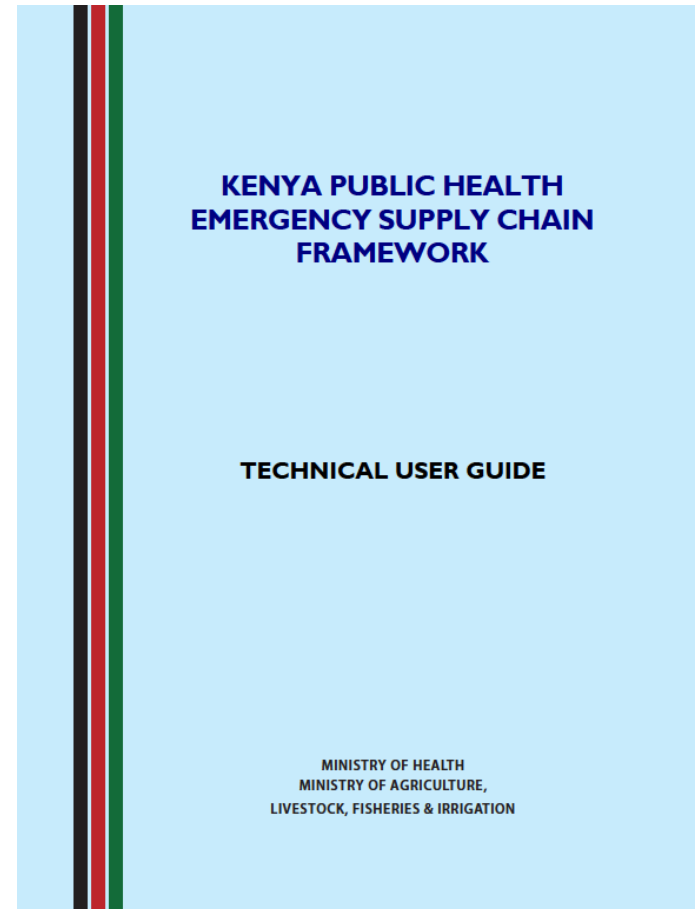
### Coordinating during an emergency

- Immediately contact all people on ESC stakeholder list
- Hold daily meetings of ESC managers and international partners
- Co-locate key stakeholders at the EOC (Emergency Operations Center)
- Communicate clearly and often under uncertainty
- Effectively manage asymmetric information by actively sharing with all partners
- Respond collectively under pressure from political leaders and the media



# Final Outputs of the GHSA Activity

- **ESC framework document**
- **ESC framework Excel Tool composed of:**
  - Governance and Finance
  - Triggers and Commodity Forecasting
  - Procurement and Stockpiling
  - Storage and Warehousing
  - Transport and Waste Management
  - Data Visibility
- **Other ESC Tools**
  - User guide
  - Disease specific job aids
  - Management checklist
  - Response quick guides/protocols for response



## Expected Impact

- Improved response to emergency disease outbreaks through a One – Health Approach
- Kenya joins the league of countries with ESC framework for Global Health Security
- Improved Kenya emergency preparedness and response for deployment of medical and non-medical countermeasures– JEE scores expected to progressively improve from score 1.0 (no capacity) to 3.0 (capacity in place)

# THANK YOU

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The USAID Afya Ugavi Activity strengthens supply chain systems and promotes commodity security. We support USAID programs and Presidential Initiatives in Kenya, focusing on HIV/AIDS, malaria, and population and reproductive health commodities.