



# Ebola Update

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**7 FEBRUARY 2023**



**@unsymbolize**

# In Memoriam



- I have no financial relationships with commercial entities to disclose.

# Ebolavirus (genus)

- Family: Filoviridae
- Enveloped, non-segmented, negative-sense, single-stranded RNA virus, seven genes
- Six species: Zaire, Sudan, Ivory Coast, Bundibugyo, Reston, and Bombali

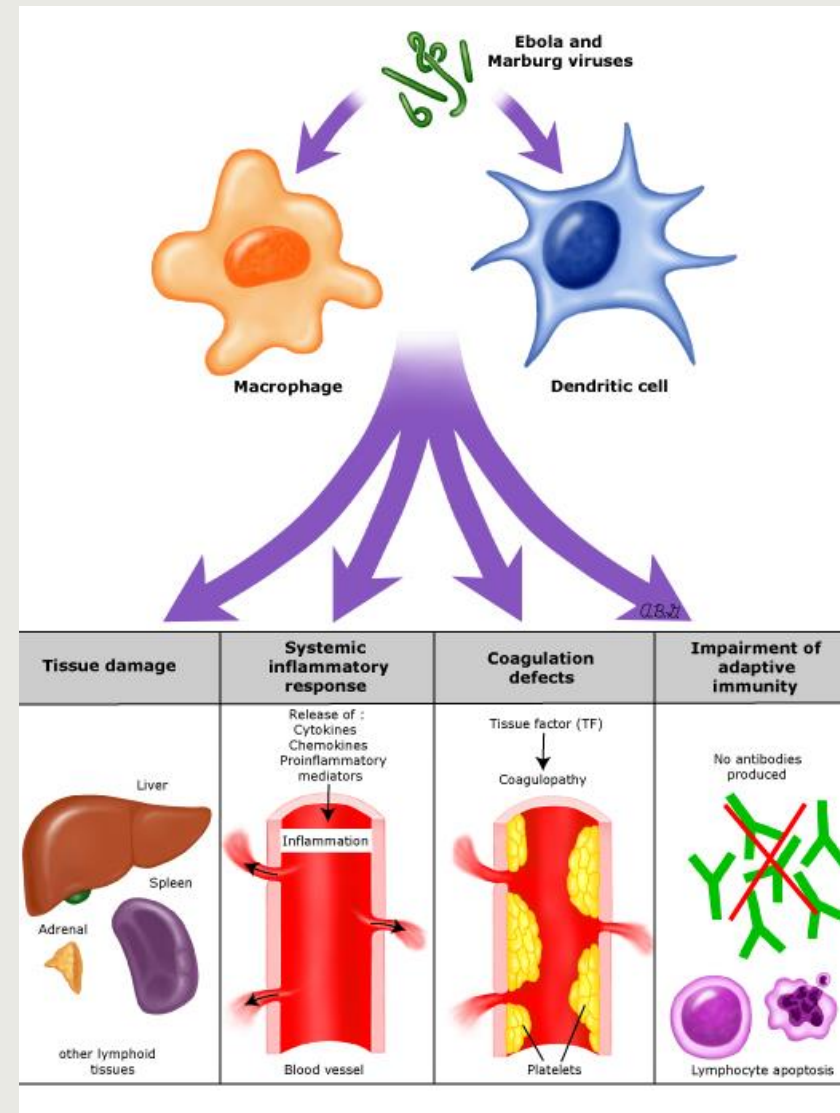


Source:  
CDC



# Pathogenesis

- Cell entry and tissue damage
  - Gastrointestinal dysfunction
  - Systemic inflammatory response
  - Coagulation defects
  - Impairment of adaptive immunity
- Source: UpToDate



# Sierra Leone







# Suspect case definitions

Source: WHO ETC  
Clinical Guidelines

**1**

CONTACT WITH SUSPECTED/PROBABLE/KNOWN EBOLA CASE  
AND  
ACUTE FEVER\* (>38°C if able to measure)

**OR****2**

CONTACT WITH SUSPECTED/PROBABLE/KNOWN EBOLA CASE  
AND  
ANY 3 OF THE SYMPTOMS LISTED BELOW IN BOX 3

**OR****3**

ACUTE FEVER\* (>38°C if able to measure)  
AND  
ANY 3 OF:

- HEADACHE
- SEVERE FATIGUE
- GENERAL BODY PAIN / PAINFUL MUSCLES/JOINTS
- BREATHING DIFFICULTY
- LOSS OF APPETITE (ANOREXIA)
- NAUSEA / VOMITING
- DIARRHOEA
- ABDOMINAL PAIN
- DIFFICULTY SWALLOWING
- HICCUP
- (Child – crying ++ (< 5yr); difficulty breathing, rash, conjunctivitis)

**OR****4**

UNEXPLAINED BLEEDING OR MISCARRIAGE























Table. Ebola care regimen for inpatients at the Hastings treatment center.

Intervention	Dose / Frequency	Days / Duration	Rationale for Use
IM vitamin K	10mg once	At admission	Assists with blood clotting
IM artemether	160mg once	At admission	Treats malaria
IV ceftriaxone	1g every 12 hours	Days 1-3 (first 72 hours after admission)	Treats secondary bacterial infections
IV metronidazole	500mg every 8 hours	Days 1-3 (first 72 hours after admission)	Treats secondary bacterial and parasitic infections
Ringer's lactate	500ml every 8 or 12 hours	Days 1-3 (first 72 hours after admission)	Provides hydration and reduces electrolyte imbalances
Dextrose saline	500ml every 8 or 12 hours	Days 1-3 (first 72 hours after admission)	Provides hydration and energy
Zinc sulfate tablet	20mg daily	Throughout inpatient care	Supports immune function
Ibuprofen tablets	400mg every 12 hours	Throughout inpatient care	Reduces inflammation and pain
IV metoclopramide	10mg	As needed	Reduces nausea and vomiting
Artesunate-lumefantrine combination therapy tablets	daily	Days 4-6 (3 days total)	Treats malaria
Cefuroxime tables	500mg every 12 hours	Days 4-8 (5 days total)	Treats secondary bacterial infections
Metronidazole tablets	400mg every 8 hours	Days 4-10 after admission (7 days total)	Treats secondary bacterial infections
Ibuprofen tablets	400m every 12 hours	As needed	Reduces inflammation and pain
Immunoboost nutrition supplement	1 capsule daily	Throughout duration of inpatient care	Supports nutritional status
ORS solution		As needed	Reduces dehydration and electrolyte imbalances

Patients also have access to other essential drugs as needed for their individual conditions, including acetaminophen (for fever and pain), diazepam tablets (for anxiety), furosemide (for anuria and acute renal failure), omeprazole tablets (for epigastric pain), and roxithromycin (for acute pharyngitis).

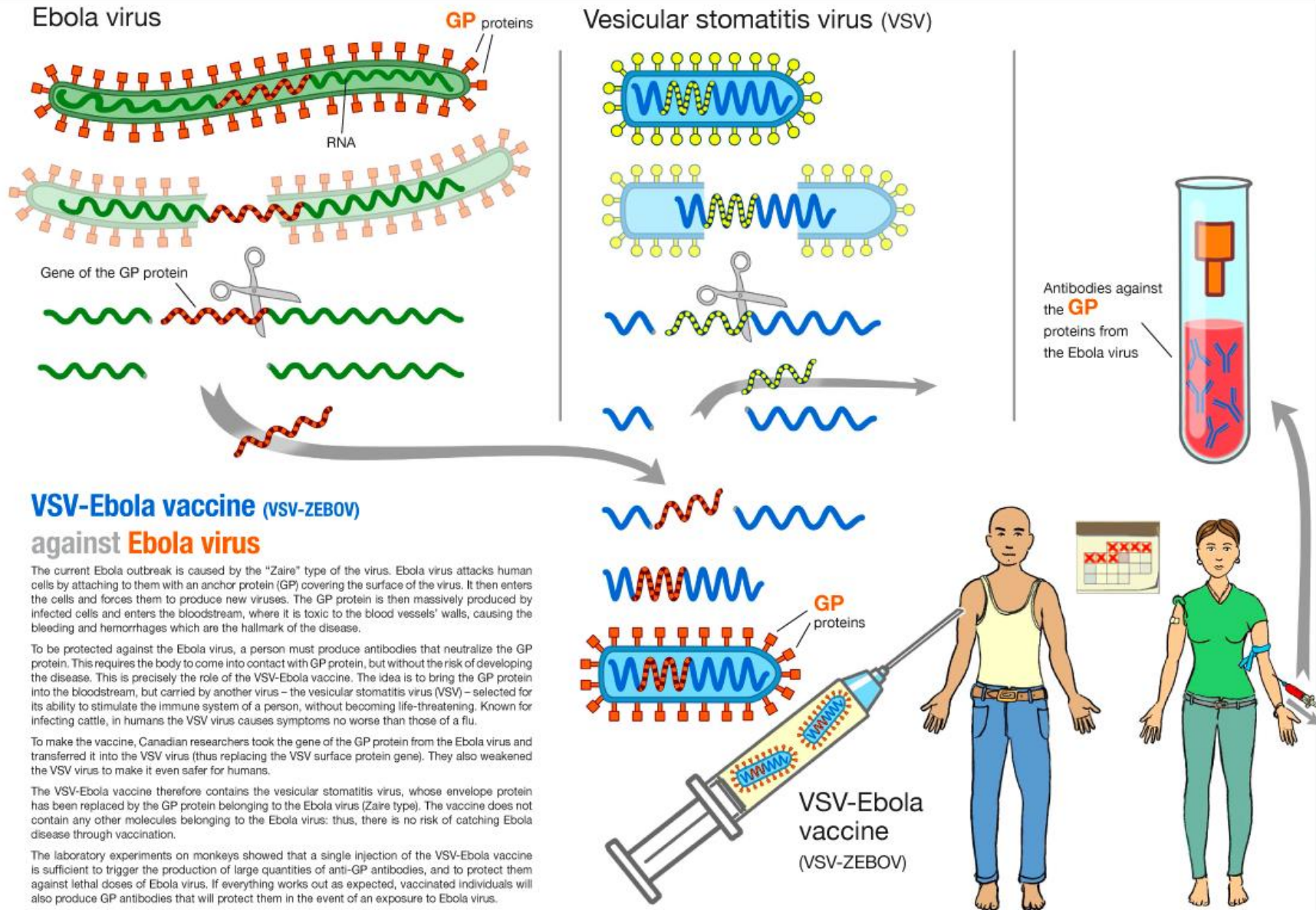
# Democratic Republic of Congo



# Vaccine



# rVSV-ZEBOV



- Derived from human adenovirus serotype 26 (Ad26) expressing the Ebola virus Mayinga variant glycoprotein
- Second component is the Modified Vaccinia Virus Ankara – Bavarian Nordic (MVA-BN) Filo-vector which contains ZEBOV, SEBOV, Marburg Virus GP and Tai Forest nucleoprotein inserts.

# Diagnosics









# Alima



# Therapeutics

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- 1) Zmapp - composed of three monoclonal antibodies, initially harvested from mice exposed to Ebola virus proteins, that have been chimerized with human constant regions. Manufactured in the tobacco plant (pharming).
- 2) Remdesivir - a novel nucleotide analogue prodrug.
- 3) Regeneron - cocktail of three human monoclonal antibodies that target the Ebola virus glycoprotein.
- 4) MAb114 - A single monoclonal antibody that targets the receptor-binding domain of Ebola virus glycoprotein

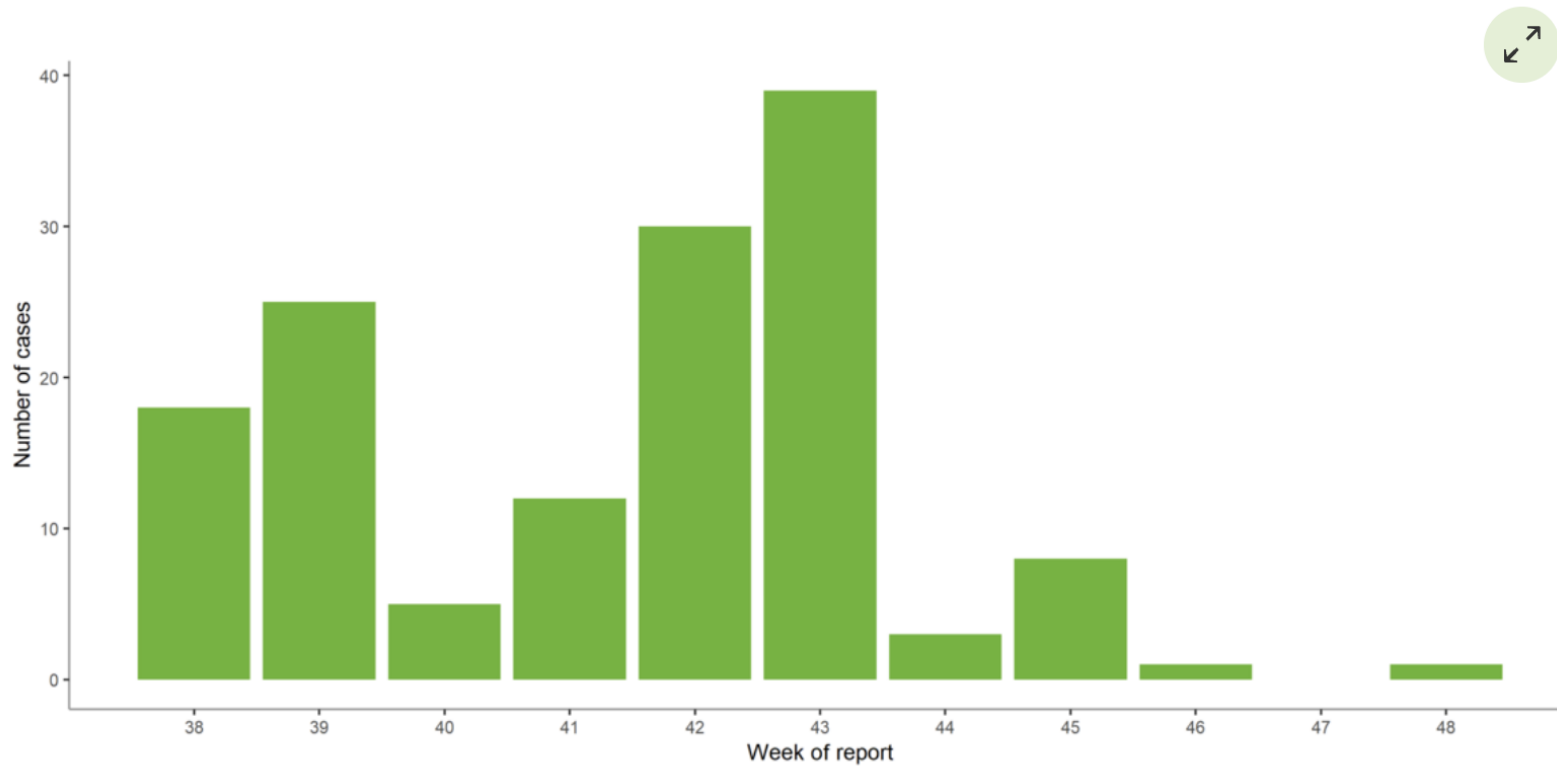
# Uganda 2022-23

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- Sudan ebolavirus
- 142 confirmed cases of Sudan virus disease (SVD) were reported, of which 55 died (CFR: 39%), and 87 recovered.
- In addition, 22 deaths among probable cases were reported in individuals who died before samples could be taken (overall CFR: 47%). At least 19 healthcare workers were infected, of whom seven died.
- Over 4000 contacts were followed up for 21 days.
- Declared over on 11 January 2023.

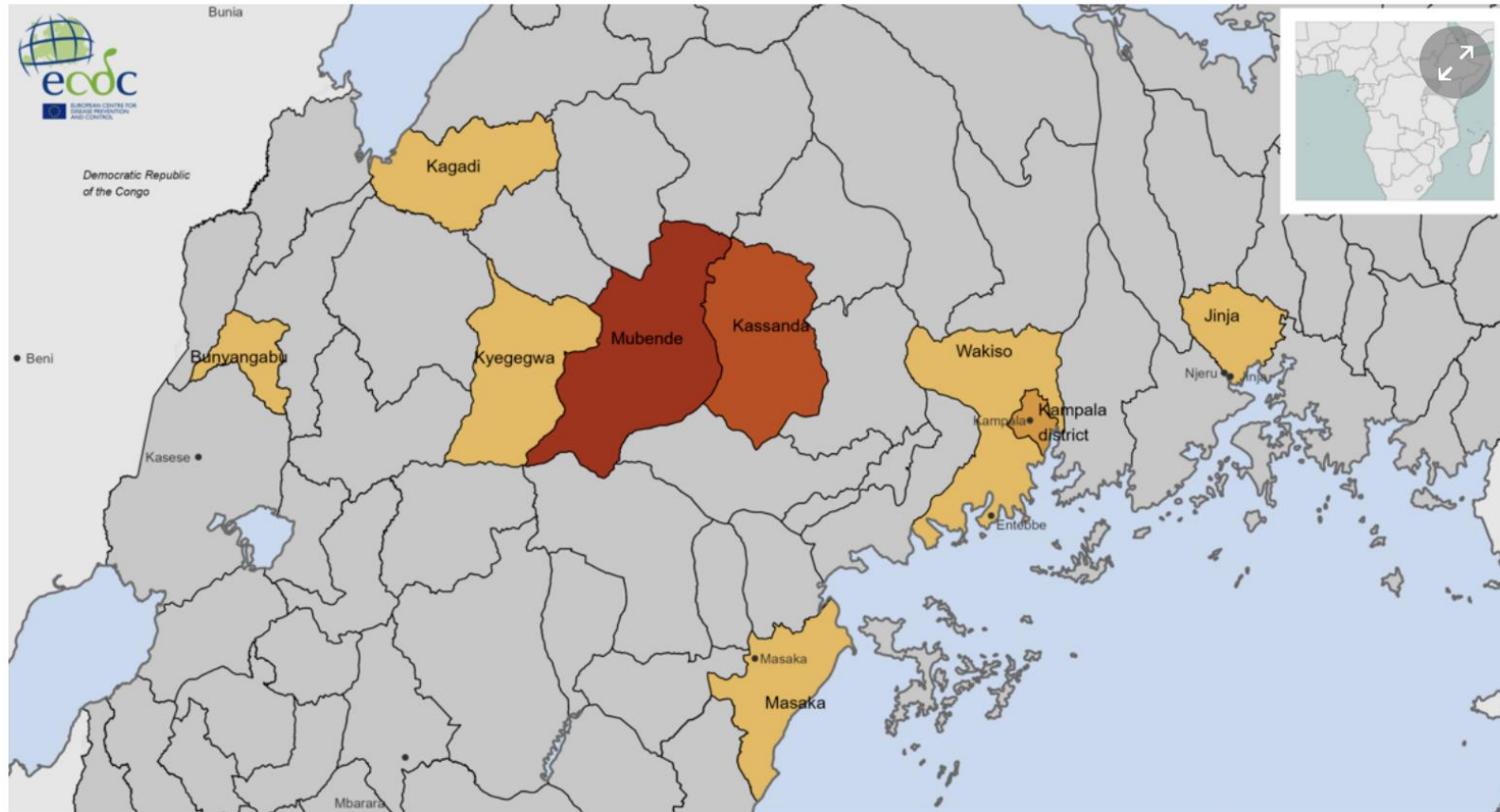


## Ebola cases in Uganda, 2022



**i** Ebola cases in Uganda 2022. Source: WHO; Ministry of Health, Uganda; Government of Uganda

# Geographical distribution of SVD cases in Uganda, 2022











Number of Ebola virus disease cases reported in Uganda as of 11 January 2023

0	1-9	10-39	40-59	>=60
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Administration boundaries: © Eurographics  
The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC. Map produced on 11 January 2023. Data collected from official sources. Dots indicate cities with population above 50 000.

## Vaccines ready for clinical testing in Uganda

Type of vaccine	Vaccine developer	Viruses targeted	No. of doses	Immunogenicity + safety in humans?	Efficacy against SUVD in animals? <sup>1</sup>
cAd3	Sabin Vaccine Institute + US NIH	Sudan ebolavirus	Single 	Yes 	Yes 
cAdOx1	University of Oxford	Sudan + Zaire ebolaviruses	Single 	Yes 	Yes 
rVSV <sub>SUVD</sub>	Merck/IAVI	Sudan ebolavirus	Single 	No	Yes 

<sup>1</sup> Each vaccine incorporates the ebolavirus surface protein into a harmless adenovirus (Ad). Both vaccines can protect animals against a potentially lethal dose of the Sudan ebolavirus.



## HEALTH

# An early lesson from the Uganda Ebola vaccine trial: Shots must be ready to go before the next outbreak strikes

- “If we’re being truly strategic, what we should be doing is have ready-to-go trial platforms in a set of countries with products ready to go. But that requires ... a huge effort on everyone’s part and potentially an effort that doesn’t result in immediate results,” Ryan said in an interview with STAT. “You could develop these products, have them in clinical lots, you could develop the trials platforms, and never use them.”

“Powerful and timely.”  
—Cornel West

# Epidemic Illusions

On the Coloniality of Global Public Health



Eugene T. Richardson  
foreword by Paul Farmer

THANK YOU

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