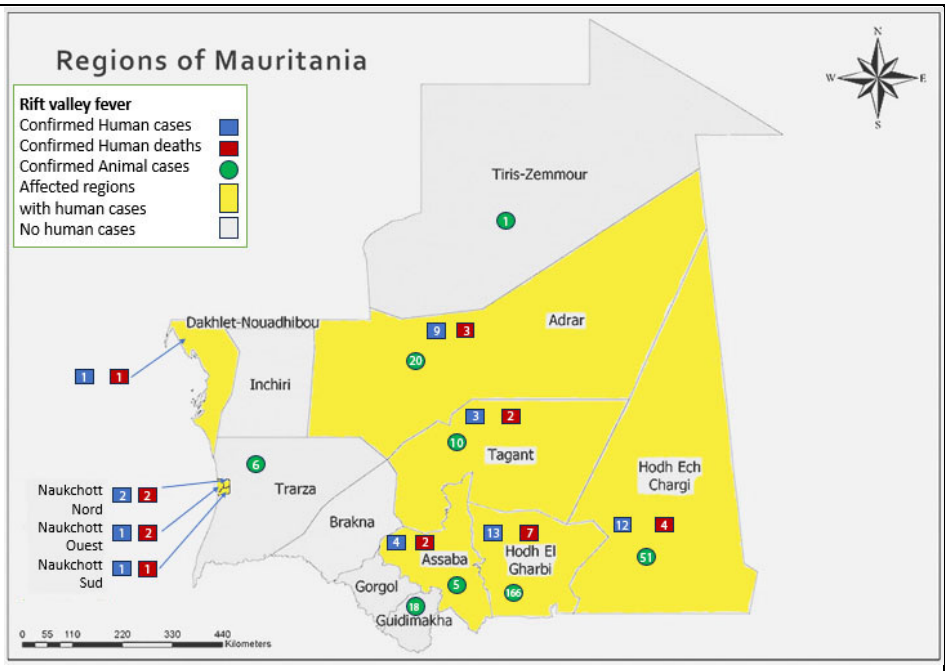
Feedback from operational stakeholders who manage or respond to outbreaks is that they are often too busy to review literature or obtain relevant background information to assist them with acute response. Unlike a traditional analytical outbreak investigation report, ***Watching Briefs*** *are intended as a rapid resource for public health or other first responders in the field on topical, serious or current outbreaks, and provide a digest of relevant information including key features of an outbreak, comparison with past outbreaks and a literature review. They can be completed by responders to an outbreak, or by anyone interested in or following an outbreak using public or open source data, including news reports.*

Watching brief

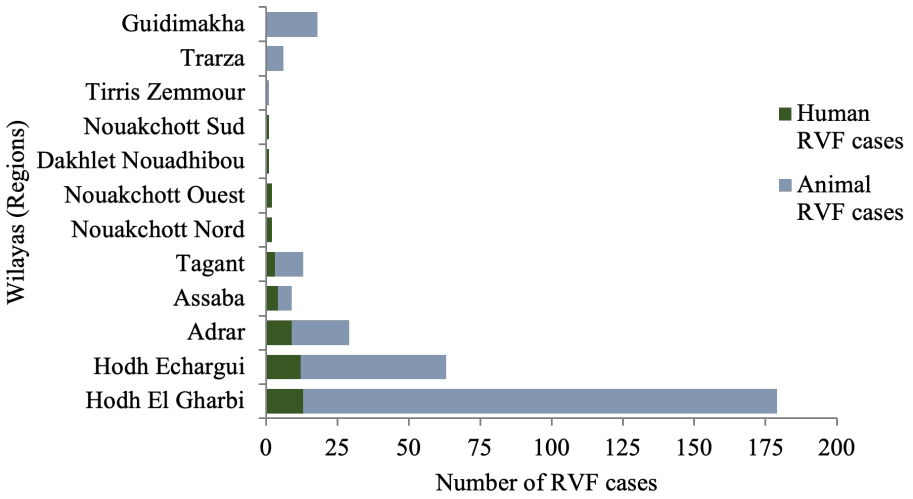
Title	Outbreak of Rift Valley Fever in Mauritania, 2022
Authors	Dr. Nounengulie Kire, Dr. Michelle Lalrinsiami , Dr. Arunpathy P, Dr. M.C.Rajkumar,
Date of first report of the outbreak	1 September 2022
Disease or outbreak	Rift Valley Fever (RVF)
Origin (*country, city, region*)	Index case was a 25-year-old male animal breeder from Tintane moughataa (also known as district), Hodh El Gharbi wilaya, Southern Mauritania [1].
Suspected Source (specify food source, zoonotic or human origin or other)	Zoonotic transmission via direct or indirect contact with the blood or organs of infected animals [1, 2], or contact with newly born livestock and aborted animals [2]. In this outbreak, the index case was an animal breeder and among the 47 confirmed cases, the majority were animal breeders [2].
Date of outbreak beginning	29 August 2022 [1]
Date outbreak declared over	N/A - Ongoing as of 25 September 2022
Affected countries & regions	Nine affected wilayas (regions) in Mauritania are:

	1. Hodh El Gharbi (13 cases, 7 Deaths) 2. Hodh Echargui (12 cases, 4 Deaths) 3. Adrar (9 cases, 3 Deaths) 4. Assaba (4 cases, 2 Deaths) 5. Tagant (3 cases, 2 Deaths) 6. Nouakchott Nord (2 cases, 2 Deaths) 7. Nouakchott Ouest (2 cases, 1 Deaths) 8. Dakhlet Nouadhibou (1 cases, 1 Deaths) 9. Nouakchott Sud (1 cases, 1 Deaths) [1]
Number of cases (specify at what date if ongoing)	47 cases as of 25 September 2022 [1]
Clinical features	Symptoms vary from person to person ranging from mild fever, headaches, malaise, and myalgias, to serious manifestations like ocular symptoms (0.5%−2%), haemorrhagic fever (<1%), and meningoencephalitis (<1%) [3]. Among the 23 deaths in this outbreak, nearly all occurred in hospitals and had symptoms that included severe thrombocytopenia and fever associated with haemorrhagic syndrome (petechiae, hematemesis, gingivorrhagia) [1].
Mode of transmission (dominant mode and other documented modes)	It is a viral disease most commonly seen in cattle like sheep, goats, and camels [1,4,5,6]. Most human infections result from contact with the blood or organs of infected animals, although some human infections result from the bite of infected mosquitoes (mostly Aedes and Culex species) [1,5,6,7,8]. Humans may also become infected by ingesting the unpasteurized or uncooked milk of infected animals [1].
Demographics of cases	Rift Valley fever spread across nine wilayas in Mauritania. **Figure 1.** Geographical distribution of confirmed human cases of Rift Valley fever (n=47), confirmed animal cases (n=277) and confirmed human deaths (n=23) from nine affected wilayas in Mauritania, 30 August - 17 October 2022.



There were more men affected than women (sex ratio of M:F cases = 4.4:1). The median age of the cases was 22 years, ranging from 3 to 70 years [1].

Figure 2. Wilayas (regions) with confirmed human and animal cases of RVF as of 17 October 2022 [1].



Confirmed human cases of RVF reported from nine wilayas, and animal cases from eight wilayas. Five wilayas reported both human and animal cases [1].

Case fatality rate

Table 1. Number of confirmed human Rift Valley fever cases, deaths and Case Fatality Rate in nine affected wilayas, Mauritania, 30 August - 17 October 2022 [1, 9].

Wilaya/Region	Confirmed RVF cases	Deaths	Case fatality rate
Hodh El Gharbi	13	7	54%
Hodh Echargui	12	4	33%
Adrar	9	3	33%
Assaba	4	2	50%
Tagant	3	2	67%
Nouakchott Nord	2	2	100%
Nouakchott Ouest	2	1	50%
Dakhlet Nouadhibou	1	1	100%
Nouakchott Sud	1	1	100%
Total	**47**	**23**	**49%**

Complications

Complications of Rift Valley Fever disease in humans include haemorrhagic syndrome, retinitis, encephalitis and death [2,4,9]. Case fatality rate with haemorrhagic form of RVF is higher, and most fatalities occur in patients who develop haemorrhagic icterus form [10].

Available prevention

Preventive measures are the following [1,22, 23]:

1. Appropriate disposal of dead animals and information campaigns for people at risk.
2. Ensure thorough cooking of animal products like blood, meat and milk before consumption.
3. Observe and report any unusual signs in animals to veterinarian as quickly as possible.
4. Eliminate larvae in breeding sites, and use of bed nets and mosquito repellents.
5. Avoid contact with the blood, body fluids, or tissues of infected animals.
6. Practice good practices in animal husbandry, hand hygiene, use personal protective equipment when handling sick animals, tissues, or during slaughter.
7. Reduce mosquito-borne transmission by staying indoors during peak biting times of the vector species.
8. Ban on movement of livestock from infected to uninfected areas.
9. Prevention outbreaks among animals by routine animal vaccination.

<table>
<tr><td>Available treatment</td><td>There is no specific treatment, only symptomatic management. Most RVF cases are self-limiting and are treated by over-the-counter medications, however, serious cases require hospitalization [11].

Ribavirin has long been considered an efficient antiviral drug choice for the management of RVF due to its in vitro as well as some in vivo efficacy against some other hemorrhagic fever viruses [12,13,14].

An inactivated vaccine has been developed but is neither licensed nor commercially available [10].</td></tr>
<tr><td>Comparison with past outbreaks</td><td>Table 2. Comparison of RVF outbreak in Mauritania 2022 with previous outbreaks [1,15,16,21].

<table>
<tr><th>Features</th><th>2010</th><th>2012</th><th>2015</th><th>2020</th><th>2022</th></tr>
<tr><td>Source of outbreak</td><td>Sick camels</td><td>Sick animals</td><td>Heavy rainfall favoring mosquito breeding</td><td>Sick camels</td><td>Animals</td></tr>
<tr><td>Number of humans affected</td><td>63 cases
13 deaths</td><td>41 cases
13 deaths</td><td>57 cases
12 deaths</td><td>78 cases
25 deaths</td><td>47 cases
23 deaths</td></tr>
<tr><td>Case Fatality Rate (CFR)</td><td>21%</td><td>50%</td><td>23%</td><td>33.3%</td><td>49%</td></tr>
</table>
</td></tr>
<tr><td>Unusual features</td><td>There were no specific features compared to previous outbreaks.</td></tr>
</table>

Critical analysis	Challenges to the mitigation efforts in Mauritania: 1. Environmental conditions: The abundant rainfall recorded this year and flooding in most of these wilayas, combined with the dumping of waste tires, used containers and garbage, enhances the proliferation of vector breeding sites [1]. 2. Many people living in Mauritania and nearby African areas are farm workers. Direct contact with body fluids, blood and meat of the infected animals are major risk factors for the RVF infection among farm workers, capable of initiating a vicious cycle of RVFV transmission [2]. 3. Infection in livestock is asymptomatic in many cases and thus it is not easy to separate the infected and unaffected animals from each other. Moreover, virus is detectable in the blood of infected animals for only seven days [17]. 4. Scientists are still unable to identify the animal host that helps amplify the virus in its enzootic phase [18]. 5. Early symptoms of RVFV are very similar to seasonal flu and other viral infections, which makes it difficult to detect early. Overlapping of signs and symptoms with other viral illness make it quite challenging to diagnose RVF timely and accurately [19]. 6. Repeated outbreaks suggest that the national human surveillance system faces operational challenges ranging from early detection to notification of cases [20]. Recommendations for better control to prevent the re-emergence of RVF outbreaks in Mauritania by: 1. Increase public awareness about preventive measures such as using long sleeved, light coloured clothing, mosquito repellents, bed nets and covering water containers. 2. Practising safe animal husbandry and safe slaughter techniques with proper hand hygiene. 3. Implementing common RVF dedicated communication actions between the public health and the veterinarian sectors a few weeks before the beginning of the rainy season. 4. Forecasting outbreaks by establishing sentinel herds at the right time to predict the arrival of potential RVF outbreaks as early as possible by using risk-mapping modelling. 5. Vaccinating animals in target areas to prevent human infection and to limit widespread viral amplification. 6. Further strengthening of the existing surveillance systems like REMEMA [20] epidemiological surveillance networks and Rift valley fever surveillance system.

Key questions	1. What is the impact of vaccination of livestock in the prevention of future outbreaks? 2. What are the Knowledge, Attitude & Practices of the community about Rift Valley Fever in Mauritania? 3. Is the current regulations on livestock market sufficient for control and prevention of RVF? One Health approach is being used to manage the epidemic response, including the establishment of a One Health technical committee for a coordinated response at the national level. In the affected wilayas, coordination meetings bringing together the human health and animal health sectors are held weekly. 4. What is the risk of spreading to neighbouring countries? Regional spread of the outbreak cannot be ruled out given the proliferation of the vector in the majority of wilayas. Fourteen of Mauritania's 15 wilayas have reported either confirmed human, confirmed animal or suspected animal cases, of which nine border Mali, Senegal or Algeria. RVF is not among the diseases subject to vaccination control of cattle at the borders; and transhumance— a practice characterized by pastoralism and movement of livestock under the care of herders —is frequent within Mauritania and across the borders into Mali and Senegal [1].
Acknowledgements	This Watching Brief is an output of an epidemiology workshop between The National Institute of Epidemiology and EPIWATCH.

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