



# 2024 Outbreaks, A Primer for Otolaryngologists

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## Introduction

- In light of recent global infectious disease outbreaks (i.e. COVID-19, mpox), **it is prudent for healthcare providers to maintain a working knowledge of global disease trends** that have the potential to affect our patients
- To this end, we seek herein to provide **an overview of global outbreaks in 2024** and to highlight **relevant otolaryngologic symptoms** that are associated with these diseases.

## Methods

- The World Health Organization (WHO) releases information about confirmed acute public health events and emerging disease outbreaks through **Disease Outbreak News (DON) reports**
- Events are classified as notable based on case numbers in excess of normal expectancy, changes in global distribution, or new clinical presentation
- We reviewed DON reports released from January to December 2024 to compile a list of global health events in 2024
- We selected a subset to review further the following inclusion criteria: **WHO global risk assessment of moderate or high, lesser-known diseases, and/or better-known diseases with new features**
- Next we conducted a **literature review of English language articles using disease names and otolaryngology-related terms** on Pubmed Central and Embase through January 25th, 2025
- For each disease, we **compiled information on the disease pathophysiology, geographic distribution, and presentation, including otolaryngologic signs and symptoms**

## Results

- 46 DON reports were released in 2024 on 17 diseases.** We selected the following 12 diseases to review given their respective inclusion criteria:

INCLUSION CRITERIA	Name of Outbreak	2024 Outbreak Dates and Regions	Disease Background	Signs/Symptoms (ENT-specific manifestations in bold)
	Dengue	May-July 2024 - Global, particularly in region of the americas	Mec: flavivirus with four serotypes (DENV-1 to DENV-4), infects humans primarily through Aedes mosquito bites. Disease severity is largely immune-mediated: during secondary infection with a different serotype, non-neutralizing antibodies enhance viral entry into Fc receptor-bearing cells—a process known as antibody-dependent enhancement (ADE) resulting in high viral loads, excessive cytokine release, endothelial dysfunction, and plasma leakage Tx: currently no treatment - symptomatic management only. Live, attenuated vaccine available, but only for those who have been infected prior	Fever (high-grade, often biphasic), headache (retro-orbital pain common), myalgias, rash, <b>facial flushing</b> , abdominal pain, nausea/vomiting, hemorrhagic manifestations ( <b>epistaxis, gum/oral bleeding, erythematous taste buds</b> )
MODERATE/HIGH RISK	Hypervirulent Klebsiella Pneumoniae Sequence Type 23	Jan-July 2024 - Algeria, Argentina, Australia, Canada, India, Iran, Japan, Oman, Philippines, Switzerland, Thailand and the United Kingdom	Mec: Gram-negative bacteria belonging to the family Enterobacteriaceae naturally found in the environment as well as mammalian mucous membranes. Of new concern, sequence type 23 carries resistance to the carbapenem antibiotics Tx: alternative antibiotics, such as polymyxins, tigecycline, or combination antibiotics	Range of presentations given type of infection, but include pneumonia, urinary tract infections, and bloodstream infection (bacteremia) or meningitis
MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS	Middle East Respiratory Syndrome Coronavirus	8/13/23-2/1/24 to 4/10/24-4/17/24 - Saudi Arabia	Mec: a zoonotic virus closely related to SARS-CoV but typically causing a more rapid progression to respiratory failure. Human infections are believed to originate either directly from bats or via an intermediate host (the dromedary camel). MERS-CoV primarily targets the respiratory tract, infecting and replicating within the epithelial cells of both the upper and lower airways Tx: currently no treatment or vaccine - symptomatic management only	Fever, cough, shortness of breath, <b>odynophagia, nasal congestion</b> , nausea, vomiting, diarrhea
LESSER KNOWN	Marburg Virus	9/28-12/20/24 - Rwanda	Mec: caused by orthoebolaviruses and orthomarburgviruses, infected after prolonged exposure to mines/caves inhabited by fruit bat colonies that is the natural host. Spreads between people via direct contact through mucosal surfaces with the blood or other bodily fluids of infected people. Incubation period varies from two to 21 days. High fatality rate of up to 90% Tx: currently no treatment or vaccine - symptomatic management only	Fever, headache, <b>odynophagia, hiccups, malaise, diarrhea, rash, abdominal pain and cramping, nausea, vomiting, hemorrhagic manifestations (bleeding from mucosal surfaces like the nose, esophagus, ear, and mouth), encephalopathy</b>
NEW FEATURES	Oropouche Virus	1/1-11/25/24 - Bolivia, Brazil, Canada, Caymans, Colombia, Cuba, Ecuador, Guyana, Panama, Peru, USA, EU	Mec: arboviral disease caused by the Oropouche virus (OROV), a segmented single-stranded RNA virus. The <i>Culicoides paraensis</i> midge, found in forested areas and around water bodies, or certain <i>Culex quinquefasciatus</i> mosquitoes, serve as vectors, transmitting the virus from infected humans to other humans Tx: currently no treatment or vaccine - symptomatic management only	Fever, headache, cough, <b>nasal congestion, odynophagia, abdominal pain, joint stiffness/pain, chills, nausea and vomiting, can progress to encephalitis or meningitis</b>
	Chandipura Virus	Early 6/24 to 8/15/24 - India, largest outbreak in 20 years	Mec: single-stranded RNA virus of the Rhabdoviridae family, first isolated in 1965 in Chandipura village, India. Transmitted by infected sand flies from an unknown reservoir and is a major cause of pediatric encephalitis in India. The virus invades neuronal cells and leads to neuronal apoptosis, cerebral edema, and rapid progression to encephalitis Tx: currently no treatment or vaccine - symptomatic management only	Fever (high-grade, acute onset), seizures, altered mental status, vomiting, headache, encephalitis, rapid progression to coma or death
	Psittacosis	End of 2023 to start of 2024 - Austria, Denmark, Germany, Sweden and the Netherlands	Mec: caused by the bacteria chlamydophila psittaci, transmitted by contact with secretions from infected birds, limited reports of human-human transmission though it can occur Tx: antibiotics (doxycycline)	Fever/chills, cough, sore throat, dyspnea
	Nipah Virus	2023 - 2024 - Bangladesh	Mec: non-segmented, negative-sense RNA virus of the Paramyxoviridae family, Henipavirus genus, with Pteropus (fruit) bats serving as the primary natural reservoir. Transmission to humans occurs through direct contact with infected animals (bats or pigs), consumption of contaminated fruit or raw date palm sap, or human-human transmission. Spreads to the CNS through the olfactory cleft Tx: currently no treatment or vaccine - symptomatic management only	Fever, headache, cough, sore throat, leading to acute respiratory distress, seizures, myoclonus, and fatal encephalitis
	Western Equine Virus	1/30/24 - Uruguay	Mec: mosquito-borne viral disease that affects both equines and humans; with birds acting as a reservoir. Most infections are asymptomatic or present as mild febrile illness, but in a subset of patients (especially pediatric patients) symptoms can progress to severe neurologic disease Tx: vaccine is available for equines but not humans, diagnosed by detection of WEE IgM in CSF	Fever, headache, lethargy, photophobia, vomiting, <b>neck stiffness, vertigo</b> , encephalitis
	Circulating Vaccine-Derived Poliovirus	12/20/23 and 12/27/23 - Indonesia	Mec: a member of the Picornaviridae family, the virus is transmitted primarily through the fecal-oral route, entering the body via the mouth or nose and replicating initially in the oropharyngeal and intestinal mucosa, particularly in the tonsils, cervical lymph nodes, and Peyer's patches, from where it can also invade the CNS. Two types of vaccination are in use globally: inactivated poliovirus vaccine (used in the US) and oral poliovirus vaccine, which contains live attenuated virus and carries a rare risk of vaccine-derived poliovirus (VDPV) due to viral reversion to neurovirulence Tx: Vaccination and supportive care for severe/long-term survivors	In mild cases: fever (mild, resembling a flu-like illness), <b>odynophagia, headache</b> . In severe cases: <b>neck stiffness/pain, muscle weakness, acute flaccid paralysis, respiratory muscle paralysis</b> . In long-term survivors, residual muscle weakness.
	Mpox Clade 1b	8/14 through end of 2024 - Global	Mec: double stranded DNA virus in the orthopoxvirus genus in the poxviridae family, along with variola virus (smallpox), cowpox virus, and vaccinia virus (virus used in smallpox vaccines), natural hosts include monkeys, rope and tree squirrels, Gambian poached rats, and dormice. Tx: currently no treatment or vaccine - symptomatic management only	Fever/chills, headaches, <b>vesicles, pustules</b> involving the skin and <b>oral cavity</b> , perilesional lymphadenopathy (including <b>cervical lymphadenopathy</b> )
	Bovine Influenza A	4/1/24 - USA	Mec: caused by the Orthomyxoviridae family, negative-sense single-stranded RNA viruses that cause acute respiratory disease in different hosts including birds, humans, and cows, this specific outbreak is caused by prolonged exposure of humans to the virus in H5N1-infected cattle Tx: oral oseltamivir for patient and for prophylaxis	Cough, conjunctivitis

Table 1 (Left): Global Outbreaks in 2024, Disease Background, and Otolaryngologic Symptoms

## Discussion

- Diagnostic vigilance:** Otolaryngologists serve as many patients' main points of contact in our diverse healthcare system and should have a working awareness of global health trends that may affect our patient population
- Overlap of symptoms:** Many emerging infections present with upper respiratory or ENT-related complaints (e.g., sore throat, nasal congestion, anosmia, dysphagia, lymphadenopathy)
- Global connectivity:** With increased international travel, otolaryngologists in non-endemic countries should maintain awareness of imported cases
- Enhanced transmission risk:** Many ENTs in practice frequently perform aerosol-generating procedures (e.g., endoscopy, suctioning, tracheostomy) that may heighten transmission risk

## Disclosures

All authors have no financial contributions to disclose.

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