

Emerging Pathogens Review & Update

A Bimonthly Newsletter

The latest news, views, and announcements



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Background:

In the past twenty years, the world has witnessed multiple epidemics/pandemics affecting our daily activities, ranging from the Zika virus epidemic that affected travel to certain geographic locations to the Covid19 pandemic that led to global quarantine and impacted almost every facet of life as we know it. It is inevitable that the next pandemic is now in the making.

At P&G we strive to anticipate the next pandemic before it takes significant ground so we can do our part in helping to alleviate the spread by assisting in breaking the cycle of transmission with our products.

Part of our preparedness strategy is to monitor news and updates from different surveillance networks on evolving pathogens so the businesses can make appropriate and timely business decisions. In this bimonthly newsletter, we will explore the status of emerging pathogens across the globe. The newsletter is intended to simplify public health information by curating the external information (from various surveillance agencies) to identify pathogens of potential business relevance. This will bring awareness and highlight global threats, providing the BU with early information that can provide a competitive advantage. BUs should follow their own internal protocols on how to utilize the information and whether future work is needed.

What is an emerging pathogen?

A pathogen is a micro-organism causing diseases to its host. Pathogens can be bacteria, viruses, fungi, or parasites. Pathogens encounter a host through breathing (airway passage), transmission of bodily fluids like blood, feces, urine, sweat, entering skin cuts or insect bites, or ingestion of contaminated food and/or water.

Our focus here is on **Emerging Pathogens (EP)**, which are defined as pathogens causing infections that have newly appeared in a population or have existed but are rapidly increasing in incidence or geographic range. Emerging pathogens are what will cause future pandemics and numerous surveillance agencies across the world are working diligently to track and monitor.

For P&G surveillance, we will track updates from WHO for global threats, US CDC for national threats, ProMED and EpiCore for on the ground informers.

Agencies Tracking EP Nationally and Globally

Numerous agencies are currently focusing on monitoring, surveying, and tracking EP across the globe. In the US, although EPs are identified and tracked by several agencies, the list of EPs is identified under the guidance of the US Homeland National Security (which determines threat assessment), the Center of Disease Control and Prevention (which governs agencies response and coordinates public communication) and the National Institute of Health (which coordinates research and advance translational sciences).

The World Health Organization (WHO) is the United Nations agency that brings together nations to promote human health. WHO works primarily with governments and their local healthcare systems to

build the bridge in knowledge among their country members and directs and coordinates the world's response to health emergencies. They currently exist in 194 of the 195 countries in the world and provide invaluable resources of information and guidance in times of crisis. Accordingly, WHO has its own list of EPs that it constantly watches. In addition, WHO works diligently to build surveillance teams that monitor any new public health threat of unknown etiology.

Like the US CDC, there is the European CDC, the Africa CDC, the National Center for Disease Control (NCDC) in India, China CDC among others. The WHO acts as a liaison among all those different government agencies to organize and aid disease control and prevention at a global level.

Crowd-Sourced Surveillance

While WHO and its network of government-led agencies provide valuable information that is highly vetted by scientists around the globe, it tends to be slow in communication. Also, governments may delay the dissemination of information for various reasons. This lag in quick communication has led to the creation of a crowd sourcing system that relies on grass root teams of physicians and healthcare

ProMED (ISID):

ProMED (Program for Monitoring Infectious Diseases) stems from the International Society of Infectious Diseases (ISID) and was initiated in 1994 to identify unusual health events related to emerging and re-emerging infectious diseases and toxins affecting humans, animals, and plants. Members of the ProMED team sit in more than 30 countries and are constantly scanning for, reviewing, and posting information related to global health security, independently from WHO, governments or ministries of Health. Over the last 28 years, ProMED has been the first to report on numerous major and minor disease outbreaks and biothreats including SARS, Chikungunya, the early spread of Ebola and Zika, MERS, COVID-19 and many others.

ProMED is an important and longstanding contributor to the global emerging and re-emerging infectious disease surveillance landscape.

Because ProMED plays important role in reporting in real-time clinical reports as they happen and does little to no vetting of its own, there are times when data is not robust and erroneous reports are shared.



EpiCore (Global Disease Surveillance Project):

EpiCore is another crowdsourcing network, who's task is to gather supplementary information to validate rumors and informal reports from ProMed. The EpiCore platform was established via an alliance between four global public health organizations -including the WHO - and is independent of ProMed.

EpiCore uses local knowledge among global community public health responders engaged in human, animal and/or environmental health activities. They respond to requests for information (RFI) sent by ProMED moderators.



EP relevant to your BU.

Not every emerging pathogen is relevant to P&G business. Unless P&G products can play a significant role in mitigating its threat, it may be out of the scope of our work. In this bimonthly summary, we will divide information according to the relevant BU of interest. We will review the information obtained from WHO, CDC, ProMED and EpiCore collectively as the news sources for public health and will share out only P&G relevant information as displayed in the table below.



BU	Infection and/or Transmission route
FHC/PGP	Pathogens transmitted via contaminated surfaces
PHC	Upper respiratory tract infections
OC	Oral Cavity Pathogens & Upper respiratory Tract Infections
PCC	Pathogens transmitted via poor hand hygiene
PGV	Pathogens transmitted via insects/arthropods
BFF	Pathogens transmitted via bodily excrements, can linger in diapers or feminine pads

Table 1: Table displaying the general understanding of different BU's scope of interest and pathogens that may disrupt or affect their product portfolio. This diagram is only a suggestion, and we encourage BU members to be informed on all pathogens in the list.

Current Best Approach for Utilizing the EP Newsletter:

1. Identify an individual or team to be responsible for reading, understanding and communicating to appropriate leaders the contents of the newsletter.
2. Set expectations for this individual/team:
 - A) Obtains and reads the newsletter timely.
 - B) Gets more information if unclear
 - C) Raises information to appropriate leaders when appropriate and relevant to the BU.
3. The designated person/team/BU representative should determine if the information present request internal discussion at their relevant BU teams.
4. Each BU should follow their internal protocol on EP accordingly.
5. The newsletter editorial team is available for consultation on the EP threat level if needed.

Current EP Status in August and September of 2023:

Pathogen	Type	Relevant BU	EP Status	Location of outbreak
<i>Campylobacter jejuni</i>	Bacteria	FHC	Limited outbreak	Peru
MERS-CoV	Virus (E)	PHC/FHC	Limited outbreak	UAE
Echovirus 11	Virus (small NE)	PGP/FHC/BFF	Multinational outbreak	Europe
Dengue virus	Virus (E)	ZEVO	Multinational outbreak	Latin America & Asia
Salmonella spp.	Bacteria	PCC	National outbreak	USA
Influenza A (H1N2)v	Virus (SE)	PHC/FHC	Sporadic Infection	USA
<i>This table displays the current outbreaks for pathogens that are on the watch list as emerging.</i>				

Campylobacter jejuni

A bacteria associated with raw and undercooked food causing 1.5 million illnesses annually around the world. It can be transmitted through using contaminated dishes and kitchen tools such as cutting board. Infection with this bacterium may result in incidence of Guillain-Barre neurological syndrome.

MERS-CoV

Middle East Respiratory Syndrome coronavirus (enveloped) is a fatal disease with 35% mortality rate. Human to human transmission has been reported but is limited. The virus infection has been reported in 27 countries mostly in the Middle East with more than 2,600 reported infections. Source of infection for MERS-CoV remains undetermined although contact with bat feces or camels are the main reported source. The virus remains inefficient for human-to-human transmission though cases have occurred and been documented.

Ecovirus-11

A member of enterovirus family, (small, non-enveloped), this virus infects neonatal units, and is transmitted via multiple pathways, from mother to the newborn during delivery, via respiratory droplets or

via oral fecal route in infected nurseries by caregivers. The infection can cause severe illness including sepsis, myocarditis, and meningitis.

Dengue (Break bone fever)

This mosquito-borne virus is highly endemic in half the world. An outbreak of significant magnitude has been reported in Latin America in 2023 with ~ 3 million cases reported including 1302 deaths.

Salmonella Spp

Multistate (47) outbreaks of salmonella are associated with backyard poultry. Infection occurred through contact with contaminated feces via poor hand hygiene. Currently 690 illnesses have been reported.

Influenza A (H1N2)^v

This swine origin influenza subtype variant are currently at a limited animal to human transmission with no human to human transmission documented. There has been only 37 human infections with this variant documented, with limited human to human transmission.

Keywords:

- **Endemic:** consistent presence of a disease but limited in the number of cases being reported and the geographic location where it happens
- **Epidemic:** an unexpected increase in the number of disease cases in a specific geographical area
- **Pandemic:** A pandemic is defined as “an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people
- **Outbreak:** outbreak is the occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season.
- **Mosquito-borne pathogen:** a microbial agent that is transmitted from one host to the other via mosquito bite.

