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Dear Friends in Tourism,

## **RE: CHOLERA – Emergency Press Release**

### **Information on the reported "Cholera Pandemic"**

Questions have been directed to the **TRM Contact Centre** from SATIB clients and because of the topical nature of this issue we are sending out information proactively to all players in the industry in order to arm you with the information you need when guests, staff or business partners ask you questions about cholera. Dr Simon King has compiled the following information in the interest of educating as many people as possible about the disease.

#### **How do people get it?**

Cholera acts by releasing a toxin within the intestine. It has to get into your gut via your mouth (not absorbed through skin by bathing or showering) and it has to survive the hostile acidic stomach on the way. If it makes it to the small bowel it is well adapted to survive there; each germ is capable of "swimming" by wiggling its tail to counteract the intestine's propulsive movement which would tend to push it down and out. It is resistant to bile salts and can adhere to the intestinal wall as well. You get it by ingesting it either in water or contaminated food. The contamination comes from another individual who has cholera - fecal excretion contaminates hands or water supplies and passes the germs along. Washing food in contaminated water is a problem and swallowing water bathing or showering or while brushing teeth can pass it along. Washing hands is very important in preventing it, as is very careful food handling, washing and preparation.

#### **Is your operation at risk?**

There is a lot of concern being raised about South African sites being swept away in the Zimbabwean pandemic. The important understanding is that no-one is at any more risk of contracting cholera than they are many other illnesses spread via the fecal-oral route. Even in the midst of a community suffering an epidemic you can avoid contracting it as an individual if you are very careful about what you touch and use and how you clean and wash your hands and disinfect and manage food and what you eat and drink. It is not like an airborne spread illness which can strike no matter what you do to protect yourself.

#### **How do I know if someone has cholera?**

Perhaps this is one of the most important questions because there is a lot of minor viral based gastroenteritis going around right now which causes diarrhea and vomiting and stomach cramps along with fever and aches and pains and may look like cholera. The bottom line in picking up potential cholera patients is symptom severity. MASSIVE diarrhea is how it is typically described. Certainly patients look very ill, dehydrate quickly and it is nothing more than the consequences of rapid and massive dehydration that kill patients. Dehydration leads to kidney failure because with

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too little fluid the blood flow through the kidneys is too low and they "shut down". This worsens the electrolyte abnormalities caused by diarrhea with its fluid and electrolyte loss. Both these result in acid-base problems (the body becomes more acidic and this state of acidosis is harmful to all organ systems - our pH body-wide has to remain within very tight limits or things just don't work and get damaged. Worsening this is that low potassium states (you lose a lot of potassium in diarrheal stool) are a big problem for the heart because the heart muscle relies on potassium flow across its cell membranes in order to pump properly. So low potassium states mean heart failure, rhythm disturbances and even cardiac arrest.

#### **How much time do I have to respond?**

With cholera patients can go from symptoms to dehydration to death in under 4 hours. That's a bit extreme but not impossible. Certainly the patient gets very ill within a 12-24 hour period. The message is that if you are in a remote area, which many of our clients are, and you suspect cholera, don't wait until the next day to make a decision on what to do. Phone for help immediately.

#### **What can I do about it?**

Cholera's mortality untreated is about 50-60% in places. Treated though, the mortality is easily dropped tenfold. The treatment is almost exclusively aimed at reversing the dehydration, providing the correct rehydration fluid and volumes, either intravenously or orally. Call the TRM Contact Centre if you suspect anyone of contracting cholera - we can risk stratify the patient for you right over the phone and walk you through correct management. If you are stuck without communication for whatever reason remember that with cholera and extreme diarrhea you can't really give too much fluid so give as much as someone can feasibly drink and keep down and remember not to give just water but salt and sugar or electrolyte solution powder mixed into the water in correct proportions.

Below is an excerpt from the Online Bacteriology Textbook which gives more detail for those interested in reading this in more detail.

Sincerely,

Dr. Simon King  
**Managing Director**  
**TRM Contact Centre**

#### ***Vibrio cholerae* and Asiatic Cholera (page 1)**

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(This chapter has 4 pages)

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## Introduction

The genus *Vibrio* consists of Gram-negative straight or curved rods, motile by means of a single polar flagellum. Vibrios are capable of both respiratory and fermentative metabolism. O<sub>2</sub> is a universal electron acceptor; they do not denitrify. Most species are oxidase-positive. In most ways vibrios are related to enteric bacteria, but they share some properties with pseudomonads as well. The Family **Vibrionaceae** is found in the "Facultatively Anaerobic Gram-negative Rods" in Bergey's Manual (1986), on the level with the Family **Enterobacteriaceae**. In the revisionist taxonomy of 2001 (Bergey's Manual), based on phylogenetic analysis, **Vibrionaceae**, **Pseudomonadaceae** and **Enterobacteriaceae** are all landed in the **Gammaproteobacteria**. Vibrios are distinguished from enterics by being oxidase-positive and motile by means of polar flagella. Vibrios are distinguished from pseudomonads by being fermentative as well as oxidative in their metabolism. Of the vibrios that are clinically significant to humans, *Vibrio cholerae*, the agent of cholera, is the most important.

Most vibrios have relatively simple growth factor requirements and will grow in synthetic media with glucose as a sole source of carbon and energy. However, since vibrios are typically marine organisms, most species require 2-3% NaCl or a sea water base for optimal growth. Vibrios vary in their nutritional versatility, but some species will grow on more than 150 different organic compounds as carbon and energy sources, occupying the same level of metabolic versatility as *Pseudomonas*. In liquid media vibrios are motile by polar flagella that are enclosed in a sheath continuous with the outer membrane of the cell wall. On solid media they may synthesize numerous lateral flagella which are not sheathed.

Vibrios are one of the most common organisms in surface waters of the world. They occur in both marine and freshwater habitats and in associations with aquatic animals. Some species are bioluminescent and live in mutualistic associations with fish and other marine life. Other species are pathogenic for fish, eels, and frogs, as well as other vertebrates and invertebrates.

*V. cholerae* and *V. parahaemolyticus* are pathogens of humans. Both produce diarrhea, but in ways that are entirely different. *V. parahaemolyticus* is an invasive organism affecting primarily the colon; *V. cholerae* is noninvasive, affecting the small intestine through secretion of an enterotoxin. *Vibrio vulnificus* is an emerging pathogen of humans. This organism causes wound infections, gastroenteritis, or a syndrome known as "primary septicemia."

*Campylobacter jejuni* (formerly *Vibrio fetus*), is now moved to the class **Epsilonproteobacteria** in the family **Campylobacteraceae**. *Campylobacter jejuni* has been associated with dysentery-like gastroenteritis, as well as with other types of infection, including bacteremic and central nervous

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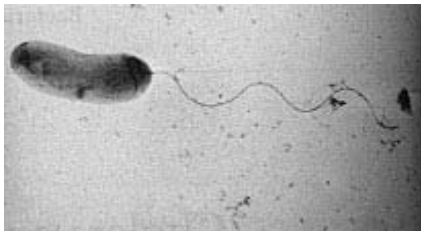


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system infections in humans. Another vibrio-like organism, *Helicobacter pylori* causes duodenal and gastric ulcers and gastric cancer. It is also reclassified into the class **Epsilonproteobacteria** family **Helicobacteraceae**.



*Vibrio cholerae*

## Cholera

**Cholera** (frequently called **Asiatic cholera** or **epidemic cholera**) is a severe diarrheal disease caused by the bacterium *Vibrio cholerae*. Transmission to humans is by water or food. The natural reservoir of the organism is not known. It was long assumed to be humans, but some evidence suggests that it is the aquatic environment.

*V. cholerae* produces **cholera toxin**, the model for enterotoxins, whose action on the mucosal epithelium is responsible for the characteristic diarrhea of the disease cholera. In its extreme manifestation, cholera is one of the most rapidly fatal illnesses known. A healthy person may become hypotensive within an hour of the onset of symptoms and may die within 2-3 hours if no treatment is provided. More commonly, the disease progresses from the first liquid stool to shock in 4-12 hours, with death following in 18 hours to several days.

The **clinical description** of cholera begins with sudden onset of massive diarrhea. The patient may lose gallons of protein-free fluid and associated electrolytes, bicarbonates and ions within a day or two. This results from the activity of the cholera enterotoxin which activates the adenylate cyclase enzyme in the intestinal cells, converting them into pumps which extract water and electrolytes from blood and tissues and pump it into the lumen of the intestine. This loss of fluid leads to dehydration, anuria, acidosis and shock. The watery diarrhea is speckled with flakes of mucus and epithelial cells ("rice-water stool") and contains enormous numbers of vibrios. The loss of potassium ions may result in cardiac complications and circulatory failure. Untreated cholera frequently results in high (50-60%) mortality rates.

**Treatment of cholera** involves the rapid intravenous replacement of the lost fluid and ions. Following this replacement, administration of isotonic maintenance solution should continue until the diarrhea ceases. If glucose is added to the maintenance solution it may be administered orally, thereby eliminating the need for sterility and iv. administration. By this simple treatment regimen, patients on the brink of death seem to be miraculously cured and the mortality rate of cholera can be reduced

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more than ten-fold. Most antibiotics and chemotherapeutic agents have no value in cholera therapy, although a few (e.g. tetracyclines) may shorten the duration of diarrhea and reduce fluid loss.