

# *Cholera*

# BACKGROUND

- Cholera, is a Greek word, which means the gutter of the roof.
- It is caused by bacteria: *Vibrio cholerae*  
→ discovered in 1883 by Robert Koch during a diarrheal outbreak in Egypt.

# Definition

- A serious acute intestinal disease → V.C
- characterized by sudden onset, profuse, effortless watery stools, vomiting, rapid dehydration, muscular cramps, acidosis and circulatory collapse.
- CFR in untreated > 30 – 40%
- inapparent and wholly asymptomatic infections are many times more frequent than clinically recognized cases, especially El Tor.

# Magnitude of the Problem

- For centuries cholera has been one of the most feared diseases. Even today
- a global threat to public health and one of the key indicators of social development.
- no longer poses a threat to countries where minimum standards of hygiene are met
- a challenge in those countries where access to safe water and adequate sanitation can't be guaranteed.

- Six cholera pandemics caused by the classical biotype
- The seventh pandemic caused by El tor.
- Cholera biotype El Tor has almost completely replaced classical cholera.

# Epidemiological determinants

## ■ Agent factors

### (a) Agent:

- antigenic classification of vibrios depends on the specific somatic (O) Ag. The flagellar antigen (H) is non-specific and common to all.
- >200 serogroups based on somatic O-antigen. O1 and O139 serogroups are responsible for epidemic cholera.
- O1 serogroup subdivided into two biotypes: El Tor and classical.
- Each have three serotypes: ogawa, inaba, hikojima

- Epidemiologically, cholera due to El Tor biotype differs from classic.
- In El Tor :
  - ❖ There is a higher incidence of mild and asymptomatic infection.
  - ❖ There are fewer secondary cases in the affected families
  - ❖ Occurrence of chronic carriers are common
  - ❖ Since El Tor vibrios are more resistant than classical cholera vibrios, they survive longer in the extra intestinal environment and hence epidemics continue longer.

**(b) Toxin production:** Vibrios multiply in the lumen of small intestine and produce enterotoxins which act on cAMP system of mucosal cells and produce diarrhea

**(C) Reservoir of infection :** a case or a carrier, but also environmental reservoirs exist, as copepods in brackish water or estuaries.

Duration of carrier period is short, about 4 or 5 days.

Chronic carriers are rare.



**(d) Infective material** : Stools and vomit of cases and carriers are infectious in nature.

N.B: carriers excrete < vibrios than cases.

**(e) Period of communicability** :

case is infectious → 7-10 days.

convalescent carriers → 2 - 3 weeks

chronic carrier → one month to 10 y. or more.

# Host Factors

-Cholera usually affects persons belonging to the low SES because of poor environmental sanitation.

In endemic areas, attack rate is distinctly higher for children than for adults.

## At risk groups;

- All ages but children & elderly are severely affected.
- Subjects with blood group "O" are more susceptible- Those with type AB are at least risk.
- Subjects with reduced gastric acid or on PU Rx.

- **Environmental factors:**

Contaminated water and food are the most important environmental factors in the causation of cholera.

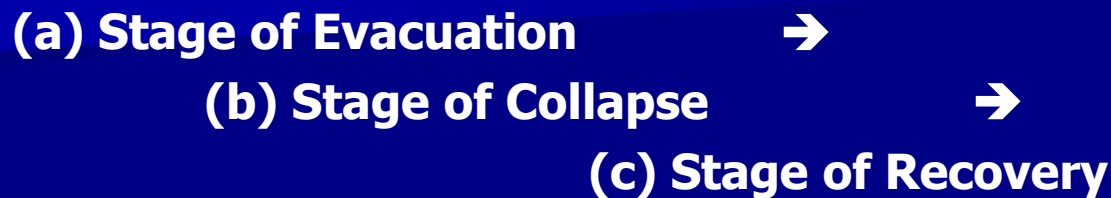
- **Mode of Transmission:**

Infection by *V. cholerae* is invariably by ingestion. Most important mode of transmission is through contaminated water.

- **Incubation Period:**

It varies from a few hours upto 5 days, but commonly 1 to 2 days. Infectivity of cholera is high, but the disease rate is low; as a rule, although many members of family may be infected, usually one of them falls ill.

# Clinical Features



- The classical form of severe cholera occurs in only 5 – 10 percent of cases.
- In the rest, the disease tends to be mild characterized by diarrhea with or without vomiting or marked dehydration.
- As a rule, mild cases recover in 1-3 days.

# Laboratory Diagnosis of Cholera

- Stool culture on (TCBS) agar.
- Dipsticks for the rapid detection of *V.C* → rectal swabs
- Transporting of the sample should be in peptone water or sea water.

# Management

- The mainstay of treatment is rehydration, and with appropriate and effective rehydration therapy mortality has decreased to less than 1%.
- Oral rehydration is usually adequate, but intravenous therapy is occasionally required.

- *ORS* → Mildly dehydrated 50 mL/kg in the first 4 hours, followed by a maintenance dose of 100 mL/kg daily until the diarrhoea stops.

For moderate dehydration, ORS 100 mL/kg is given within the first 4 hours followed by 10-15 mL/kg/hour.

- *Intravenous rehydration* is required only for severely dehydrated individuals with features of collapse. Several litres of intravenous fluid (Ringers Lactate) are usually required to overcome the features of shock. Maintenance of hydration is effectively carried out by oral rehydration solutions.



## *Antibiotics :*

- Doxycycline given in a single dose of 300 mg orally or Tetracycline given 500 mg orally QID for three days for adults (except pregnant women) and for children and pregnant women
- Co - trimoxazole in a dose of 30 mg/kg given orally in a single dose help to eradicate the infection, decrease stool output, and shorten the duration of the illness. Drug resistance is becoming an increasing problem, and ciprofloxacin is now used more frequently.

# Prevention & Control

## **(a) Improvement of environmental sanitation:**

- Health education
- Adequately chlorinated and protected water supply
- Proper disposal of excreta
- Safe food supply.

**(b) Immunization:** types of cholera vaccines are;

- (i) *Whole cell killed vaccine:* given parenterally, provides protection for 5 months, has significant side effects and low efficacy.
- (ii) *Oral Cholera Vaccines (OCV):* appear to provide herd immunity in endemic setting but role during outbreak less well defined.

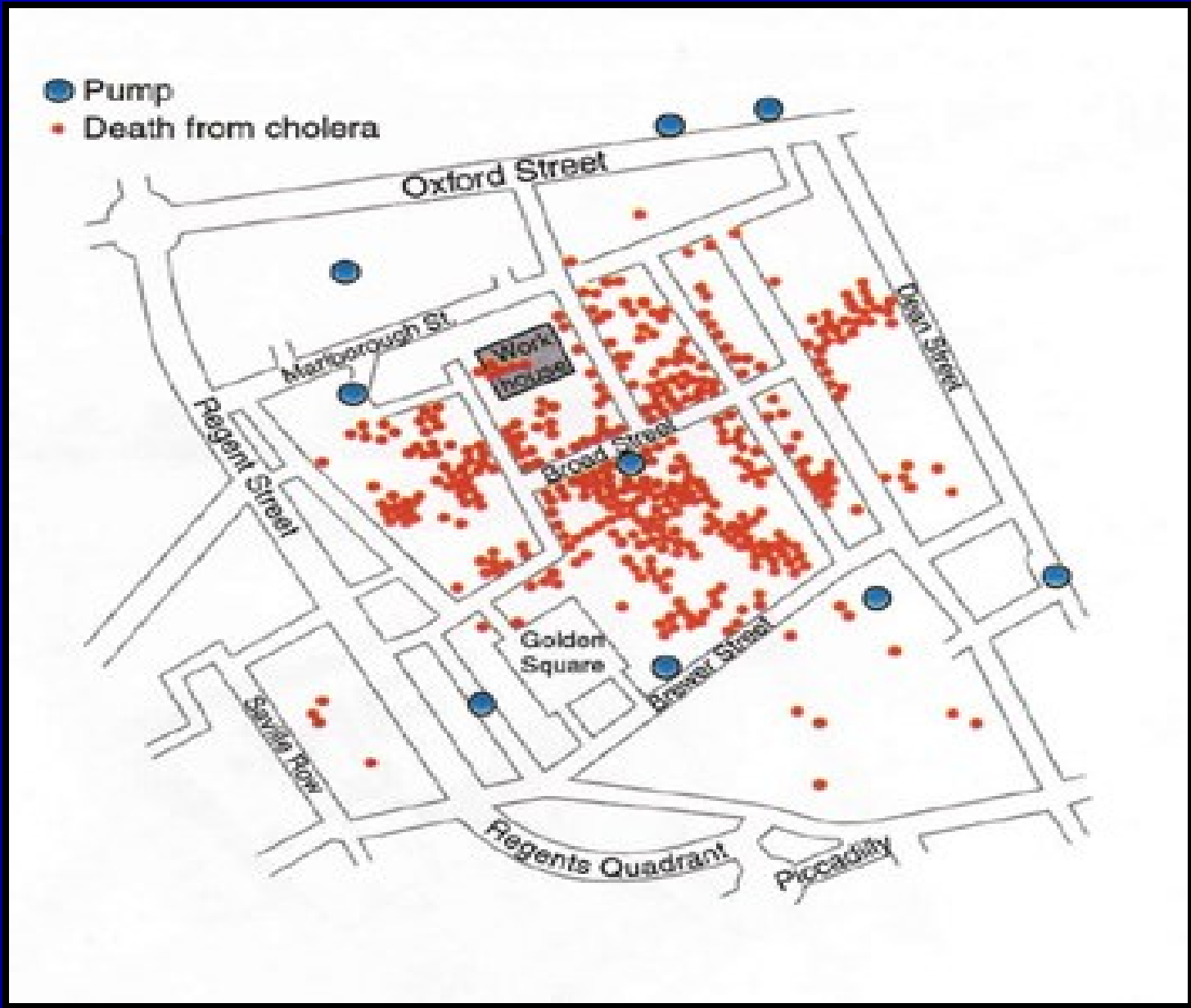
As such, immunization against cholera is not regarded as an effective means of preventing the spread of cholera internationally.

- **(c) Action on Occurrence of the Disease**
  - (i) Notification**
  - (ii) Disinfection**
  - (iii) Isolation**
  - (iv) Contacts**

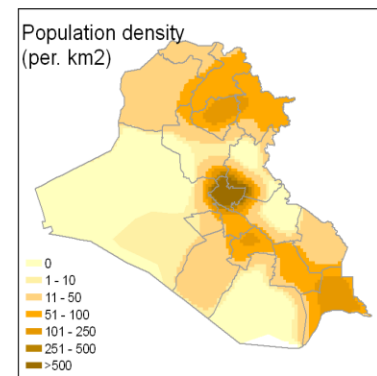
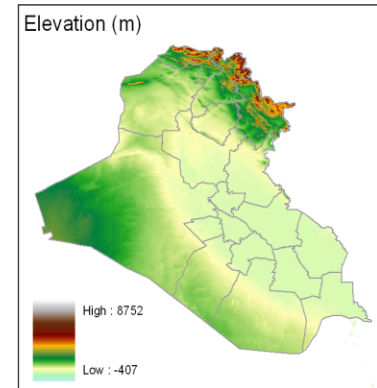
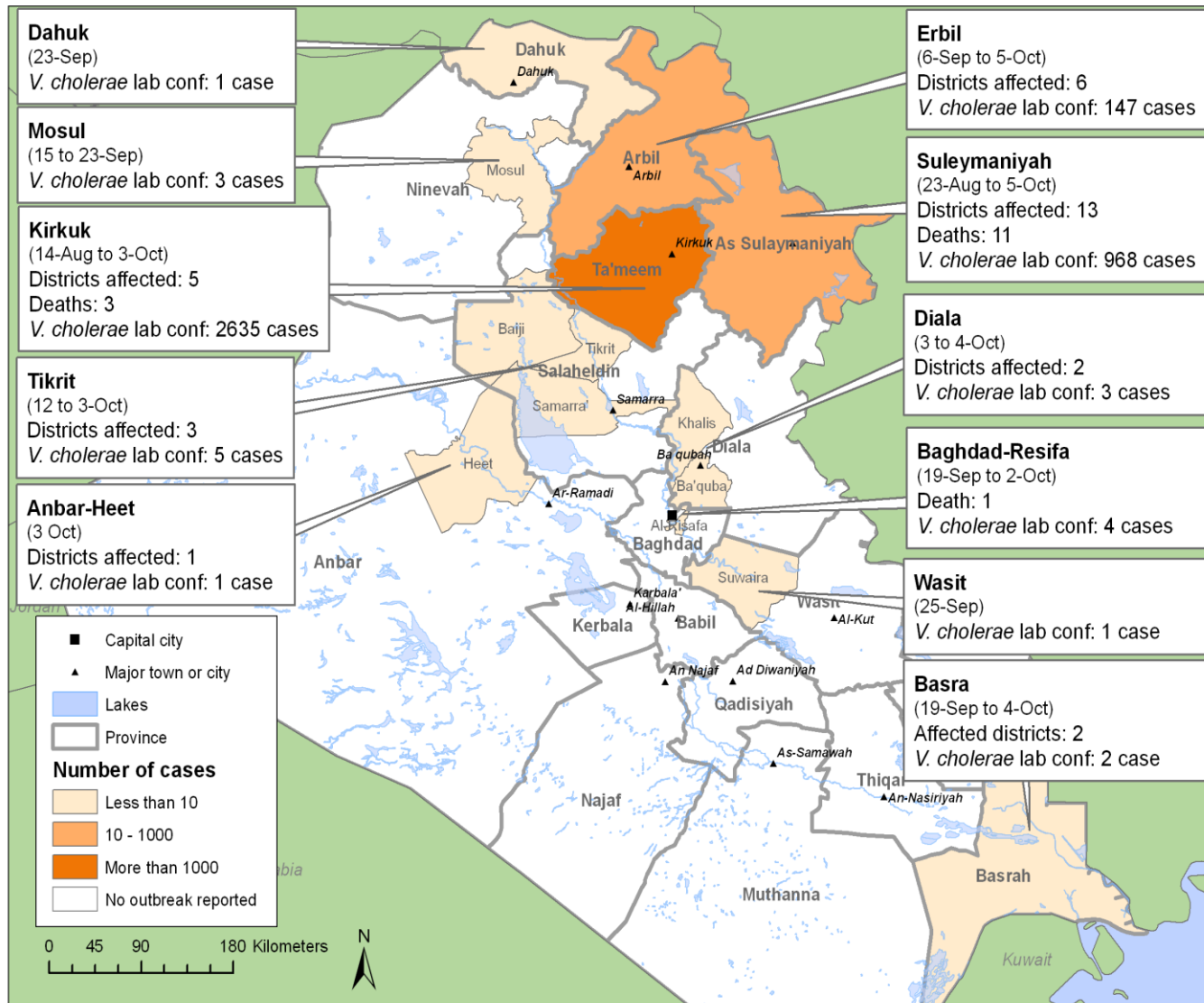
**(v) Food and Drinks:** Control of food and drinks is the most important method of control of an outbreak. The following rules should be followed in the presence of an outbreak in the community:

- Drinking water should be super chlorinated.
- Milk must be boiled.
- Uncooked vegetables and fruits which are customarily eaten unpeeled should be avoided during epidemics.
- All food must be protected against flies.

A search for mild cases should be carried out by examination of the stools of all those who are suffering from diarrhea. All diarrhea cases, however, should be treated with suspicion until



# Cholera in Iraq: Lab confirmed cases, 14 August - 5 October 2007



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Data Source: WHO Office, Iraq Summary, DCW, GTOPO  
 Map Production: Public Health Mapping and GIS Communicable Diseases (CDS), World Health Organization.  
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