**Overview**

Human botulism is a serious, potentially fatal disease caused by *Clostridium botulinum*, which produces spores that are heat-resistant and exist widely in the environment, and in the absence of oxygen they germinate, grow and then excrete toxins. There are seven distinct forms of botulinum toxin, types A–G. Four of these (types A, B, E and rarely F) cause human botulism. Botulinum toxins are ingested through improperly processed food in which the bacteria or the spores survive and produce the toxins. Though mainly a foodborne intoxication, botulism can also be caused by intestinal infection in infants, wound infections and by inhalation.

** Symptoms**

Early symptoms are marked fatigue, weakness and vertigo, usually followed by blurred vision, dry mouth and difficulty in swallowing and speaking. Vomiting, diarrhoea, constipation and abdominal swelling may also occur. The disease can progress to weakness in the neck and arms, after which the respiratory muscles and muscles of the lower body are affected. The paralysis may make breathing difficult. There is no fever and no loss of consciousness.

The symptoms are not caused by the bacterium itself, but by the toxin produced by the bacterium. Symptoms usually appear within 12 to 36 hours (within a minimum and maximum range of four hours to eight days) after exposure. Incidence of botulism is low, but the mortality rate can be high. The disease can be fatal in 5 to 10% of cases.

**Foodborne botulism**

*Clostridium botulinum* is an anaerobic bacterium, meaning it can only grow in the absence of oxygen. Foodborne botulism occurs when *Clostridium botulinum* grows and produces toxins in food prior to consumption. *Clostridium botulinum* produces spores and they exist widely in the environment including soil, river and sea water.

The botulinum toxin has been found in a variety of foods, including low-acid preserved vegetables, such as green beans, spinach, mushrooms, and beets; fish, including canned tuna, fermented, salted and smoked fish; and meat products, such as ham and sausage. Occasionally, commercially prepared foods are involved.

Though spores of *Clostridium botulinum* are heat-resistant, the toxin produced by bacteria growing out of the spores under anaerobic conditions is destroyed by boiling (for example, at internal temperature >85°C for five minutes or longer).

Food samples associated with suspect cases must be obtained immediately, stored in properly sealed containers, and sent to laboratories in order to identify the cause and to prevent further cases.

**Infant botulism**

Infant botulism occurs mostly in infants under six months of age. Different from foodborne botulism caused by ingestion of pre-formed toxins in...
food, it occurs when infants ingest *Clostridium botulinum* spores, which germinate into bacteria that colonize in the gut and release toxins.

**Wound botulism**

Wound botulism is rare and occurs when the spores get into an open wound and are able to reproduce in an anaerobic environment.

**Inhalation botulism**

Inhalation botulism is rare and does not occur naturally, i.e. it is associated with accidental or intentional (e.g. bioterrorism) events which result in release of the toxins in aerosols. Inhalation botulism exhibits a similar clinical footprint to foodborne botulism. The median lethal dose for humans has been estimated at two nanograms of botulinum toxin per kilogram of bodyweight, which is approximately three times greater than in foodborne cases.

**Other types of intoxication**

Waterborne botulism could theoretically result from the ingestion of the pre-formed toxin. However, as common water treatment processes (e.g. boiling, disinfection with 0.1% hypochlorite bleach solution) destroy the toxin, the risk is considered low.

Botulism of undetermined origin usually involves adult cases where no food or wound source can be identified.

**Diagnosis and treatment**

Diagnosis is usually based on clinical history and clinical examination followed by laboratory confirmation including demonstrating the presence of botulinum toxin in serum, stool or food, or a culture of *Clostridium botulinum* from stool, wound or food. Misdiagnosis of botulism sometimes occurs as it is often confused with stroke, Guillain-Barré syndrome or myasthenia gravis.

Antitoxin should be administered as soon as possible after a clinical diagnosis. Early administration is effective in reducing mortality rates.

**Prevention**

Prevention of foodborne botulism is based on good practice in food preparation particularly preservation and hygiene. Botulism may be prevented by the inactivation of the bacterial spores in heat-sterilized or canned products or by inhibiting bacterial growth in other products. Commercial heat pasteurization (vacuum packed pasteurized products, hot smoked products) may not be sufficient to kill all spores and therefore the safety of these products must be based on preventing bacterial growth and toxin production. Refrigeration temperatures combined with salt content and/or acidic conditions will prevent the growth of the bacteria and formation of toxin.

The WHO Five Keys to Safer Food are:

- keep clean
- separate raw and cooked
- cook thoroughly
- keep food at safe temperatures
- use safe water and raw materials.

'Botox'

The bacterium *Clostridium botulinum* is the same bacterium that is used to produce Botox, a pharmaceutical product predominantly injected for clinical and cosmetic use. Botox treatments employ the purified and heavily diluted botulinum neurotoxin type A.

**WHO’s response**

Botulism outbreaks are rare but are public health emergencies that require rapid recognition. WHO’s role in responding to outbreaks of botulism that may be of international concern is as follows.

- Surveillance and detection
- Risk assessment: consideration of whether the outbreak is natural, accidental, or, possibly, intentional.
- Containment at the disease source: coordinates with national and local authorities in order to contain outbreaks at their source.
- Delivery of assistance: coordinates between international agencies, experts, national laboratories, airlines and commercial organizations to mobilize response equipment, materials and supplies, including the provision and administration of botulinum antitoxin.

**Sources:**


Compiled by Dr. C U D Gunasekara of the Epidemiology Unit.
<table>
<thead>
<tr>
<th>Division</th>
<th>Dengue Fever</th>
<th>Encephalitis</th>
<th>Enteric Fever</th>
<th>Food Poisoning</th>
<th>Leptospirosis</th>
<th>Typhus Fever</th>
<th>Viral Hepatitis</th>
<th>Whooping Cough</th>
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<tbody>
<tr>
<td>A</td>
<td>387</td>
<td>6</td>
<td>3</td>
<td>2</td>
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Timeliness refers to returns received on or before 01 May, 2015. Total number of reporting units: 337. Number of reporting units data provided for the current week: 209. C*-Completeness
### Table 2: Vaccine-Preventable Diseases & AFP

<table>
<thead>
<tr>
<th>Disease</th>
<th>No. of Cases by Province</th>
<th>Number of cases during current week in 2015</th>
<th>Number of cases during same week in 2014</th>
<th>Total number of cases to date in 2015</th>
<th>Total number of cases to date in 2014</th>
<th>Difference between the number of cases to date in 2014 &amp; 2015</th>
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<tbody>
<tr>
<td>Diphtheria</td>
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<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
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<td>Mumps</td>
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<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
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<td>%</td>
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<td>00 00 00 00 00 00 00 00 00</td>
<td>%</td>
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<tr>
<td>Tuberculosis</td>
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<td>60 234 3261</td>
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</tbody>
</table>

### Key to Table 1 & 2

- **Provinces:** W: Western, C: Central, S: Southern, N: North, E: East, NC: North Central, NW: North Western, U: Uva, Sab: Sabaragamuwa.
- **Data Sources:**

- AFP and all clinically confirmed Vaccine Preventable Diseases except Tuberculosis and Mumps should be investigated by the MOH

### Dengue Prevention and Control Health Messages

**Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them**

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to chepid@sltnet.lk. Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication.

ON STATE SERVICE

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