

**To the Editor**

**Case definitions in Leptospirosis: a note to Sri Lankan researchers**

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Leptospirosis is emerging as a major public health threat in Sri Lanka. Though there are gaps in research in the field of leptospirosis in Sri Lanka, an increase in research output has been observed since 2008. In contrast to research in other major infectious diseases, investigations in the field of leptospirosis are hampered by the unavailability of diagnostic facilities within the country. Because of this resource limitation, it is difficult to conduct research based on confirmed cases in the Sri Lankan setting. On reviewing published literature during the period 2007-2012, it was obvious that proper case definitions were not used in most published studies. The purpose of this letter is to provide an overview of internationally accepted diagnostic case definitions for leptospirosis based on World Health Organizations' Leptospirosis Epidemiology Reference Group consensus<sup>1</sup>. The use of these case definitions in future studies will be helpful for all Sri Lankan researchers to understand and interpret their data.

**Laboratory-confirmed cases of leptospirosis**

A laboratory confirmed case of leptospirosis is defined as,

“a patient with clinical signs and symptoms consistent with leptospirosis and any one of the following:

1. fourfold increase in Microscopic Agglutination Test) (MAT) titre in acute and convalescent serum samples;
2. MAT titre  $\geq 1:400$  in single or paired serum samples;
3. isolation of pathogenic *Leptospira* species from a normally sterile site;
4. detection of *Leptospira* species in clinical samples by histological, histochemical or immuno-staining technique;
5. pathogenic *Leptospira* species DNA detected by PCR”

In this case definition, MAT is referred to as a test done using either a regionally optimized panel of serovars or a broad panel of serovars in case of lack of data of prevalent serovars in the area or country. In Sri Lanka, MAT is not done using a broad panel of serovars. Instead Sri Lanka uses the genus specific patoc strain for MAT, results of which could not be included into the category of “laboratory confirmed” cases. In global disease estimates, only studies with confirmed cases are selected for the meta analysis of LERG, and this lack of studies with confirmed cases grossly underestimates the disease burden in Sri Lanka.

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### **Probable cases of leptospirosis**

A probable case of leptospirosis is defined as,

“a patient with clinical signs and symptoms consistent with leptospirosis and one of the following:

1. presence of IgM or a fourfold increase in IFA antibody titre in acute and convalescent serum samples;
2. presence of IgM antibodies by enzyme-linked immunosorbent assay (ELISA) or dipstick;
3. MAT titre  $\geq 1:100$  in single acute-phase serum sample in non-endemic regions”

### **Possible cases of leptospirosis**

Possible cases of leptospirosis are generally based on clinical definitions. In real life situations, this clinical definition has a wide individual variations between treating physicians. However, WHO recommends a surveillance case definition<sup>2</sup> for possible cases of leptospirosis for surveillance purposes. The Epidemiology unit of Sri Lanka uses the following case definition<sup>3</sup>.

A possible case of leptospirosis is defined as,

“Acute febrile illness, with headache, myalgia, and prostration associated with any of the following.

Conjunctival suffusion/haemorrhage

1. Meningeal irritation
2. Anuria/oliguria/haematuria/proteinuria
3. Haemorrhage – intestinal bleeding, lung bleeding or purpuric rash
4. Cardiac arrhythmias/failure

Plus:

History of exposure to infected animals/environment contaminated with animal urine”

Nevertheless the utility of this case definition in the scientific literature is limited due to validity issues of the surveillance case definition. A study done by Dassanayaka et al reported high sensitivity (92%) and specificity (74%)<sup>4</sup> for the WHO case definition for leptospirosis. However, the findings of this particular study is questionable due to the use of the abridged version of MAT as the gold standard. In another large prospective study done in Sri Lanka, in which the gold standard diagnostic tests were used to confirm cases, sensitivity and the specificity of the surveillance case definition was reported as 76% and 65% respectively<sup>5</sup>.

In conclusion, it is recommended to report the case definitions used in each study and use confirmed cases as much as possible to avoid confusion and allow better understanding of results.

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