

Seroprevalence of anti-Leptospira IgG and IgM among the urban poor communities in Wilayah Persekutuan, Kuala Lumpur

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INTRODUCTION

Malaysia has undergone cumulative growth of urbanization from 43.2% (1989) to 71% (2010) resulting in an urban population boom from 27% (1970) to 71% (2010)¹⁸ and a downward trend in the incidence of urban poverty over the past three decades from 16.5% in 1970 to 3.8% in 2009. However, urban poor communities still exist in pockets of the cities.

Leptospirosis is a zoonotic disease caused by pathogenic bacteria from the genus *Leptospira*. Human infection is known to be associated with poor waste management, in addition to recreational, occupational, or domestic activities. Infection is primarily acquired through contact with soil or water contaminated with the urine of carrier animals primarily rodents.

MATERIALS AND METHODS

Sample collection (Blood)



Figure 1: Blood drawn from participant



Figure 2: Blood samples in blood collection tubes

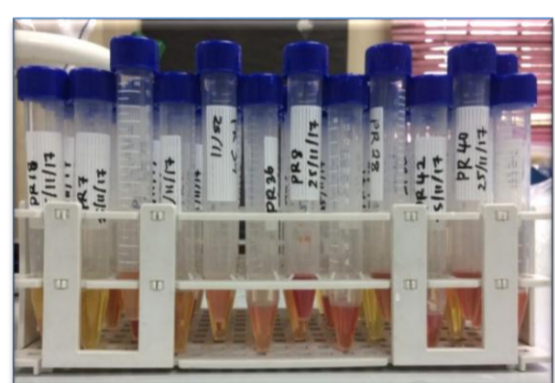


Figure 4: Falcon tubes containing blood serum of subjects

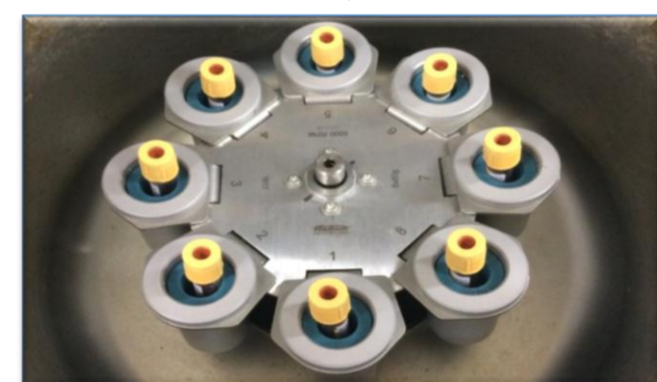


Figure 3: Centrifuge

Leptospirosis screening using ELISA kit



Figure 5: IgM *Leptospira* ELISA kits

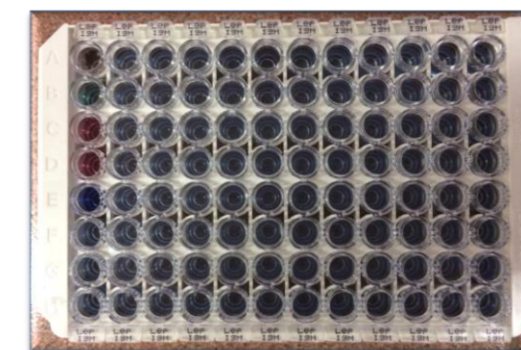


Figure 6: Dilution sample

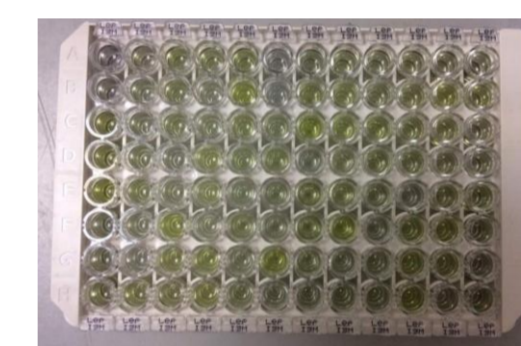


Figure 7: Adding stop solution

View at 405 nm

- Incubation at 37°C
 - Wash
 - Added :
Conjugate solution (APC)
Substrate solution (pNPP)
Stopping solution
- *repeated washing and incubation*

RESULTS

Number of participants : 532

Seroprevalence in the population was low with :

- 8.1% (n=43/532) being seropositive for anti-*Leptospira* IgG indicating past infection
- 4.9% (n=26/532) for anti-*Leptospira* IgM indicating current infection.

Table 1: Socio-demography on seroprevalence of IgM antibodies to *Leptospira* infections

Socio-demography		Seroprevalence of leptospirosis infection (%)
Sex	Male (n = 206)	2.9
	Female (n = 326)	6.1
Age*	< 12 (n = 13)	15.4
	13 - 17 (n = 15)	40.0*
	18 - 24 (n = 23)	13.0
	25 - 34 (n = 51)	0.0
	35 - 44 (n = 107)	7.5
	45 - 54 (n = 144)	2.1
Religion	> 55 (n = 179)	2.2
	Islam (n = 480)	4.8
	Buddhist (n = 5)	0.0
	Hindu (n = 42)	7.1
Occupation	Christian (n = 3)	0.0
	Others (n = 2)	0.0
	Employed (n = 187)	3.7
	Not employed (n = 345)	5.5

Table 2: Knowledge on infection in relation to seroprevalence of IgM antibodies

Knowledge on the infection		Seroprevalence of leptospirosis infection (%)
Basic knowledge of leptospirosis* P=0.017	Yes (n = 344)	3.2
	No (n = 188)	8.0 *
Leptospirosis is a fatal disease	Yes (n = 312)	3.5
	No (n = 220)	6.8
Leptospirosis is transmitted by rat	Yes (n = 399)	4.3
	No (n = 133)	6.8

Table 3: Environmental health factors in relation to seroprevalence of IgG antibodies to infections

Factors	IgG+		
	%	P - value	
Environmental health			
Accommodation	PPR or Flat house (n = 448)	7.6	0.335
	Village house or Squatter house (n = 84)	10.7	
Water sources*	Pipe and boil (n = 363)	9.6	0.043
	Mineral water (n = 169)	4.7	
Waste disposal nearby housing area	Yes (n = 345)	8.7	0.481
	No (n = 187)	7.0	
Domestic animals nearby housing area	Yes (n = 182)	6.6	0.363
	No (n = 350)	8.9	

DISCUSSION AND CONCLUSION

The seropositivity of leptospirosis infection among urban poor communities in is relative low.

Two significant factors; age ($p < 0.01$) and knowledge of disease transmission ($p = 0.017$) significantly influenced the presence of anti-*Leptospira* IgM. While detection for anti-IgG indicating past infection was influenced by the presence of clean water sources (pipe and boil) for drinking ($p = 0.043$).

Despite the low prevalence, the findings suggest the importance of knowledge on the transmission of infection among the communities through public awareness programs.

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ACKNOWLEDGEMENT

This research was financially supported by AJ Biologics (PV006-2017). The authors also like to thank to all the communities that participated in the program.