

# Leptospirosis in human groups at risk in Uruguay.

Meny P<sup>1\*</sup>, Menéndez C<sup>1</sup>, Ashfield N<sup>1</sup>, Ríos C<sup>2</sup>, Iglesias<sup>1</sup>, Quintero J<sup>1</sup>, Olinisky M<sup>3</sup>, Schelotto F<sup>1</sup> and Varela G<sup>1</sup>

<sup>1</sup>- Hygiene Institute, Universidad de la República (UdelaR), Uruguay <sup>2</sup>- Veterinary Faculty, UdelaR. <sup>3</sup>- Family and Community Medicine Department, UdelaR.

**Introduction.** In Uruguay, Leptospirosis is not fully recognized by Health system staff in rural workers or other human risk groups. It can yet lead to significant Health damage, with social and economic disturbance.

**Objectives.** We evaluated the association with animal infection and seroprevalence of specific antibodies in slum dwellers, waste recyclers in contact with urban rats, rice workers, dairy farmers and veterinarians.

- To investigate or identify the presence and spread of the disease Leptospirosis in workers with occupational risk
- To train workers on disease, hazards and prevention measures in their jobs
- To sensitize and provide information to the staff of the Health System, veterinarians and managers of production facilities

**Methods.** Printed information and spoken interactive education with imaging support was provided to workers in **32 visits**

- Serum samples and written personal survey of risk factors were obtained from **304 persons: veterinarians, dairy workers, waste recyclers, rice workers and slum dwellers**

- Canine and equine blood samples (**50 and 22**), bovine urine and water samples were also taken from living or working environments, for contributing to disease prevention.

- Technique: Micro-Agglutination Test (MAT) in all blood serum samples; IgM Indirect Immunofluorescence<sup>1</sup> (IFI) was done only in human samples.

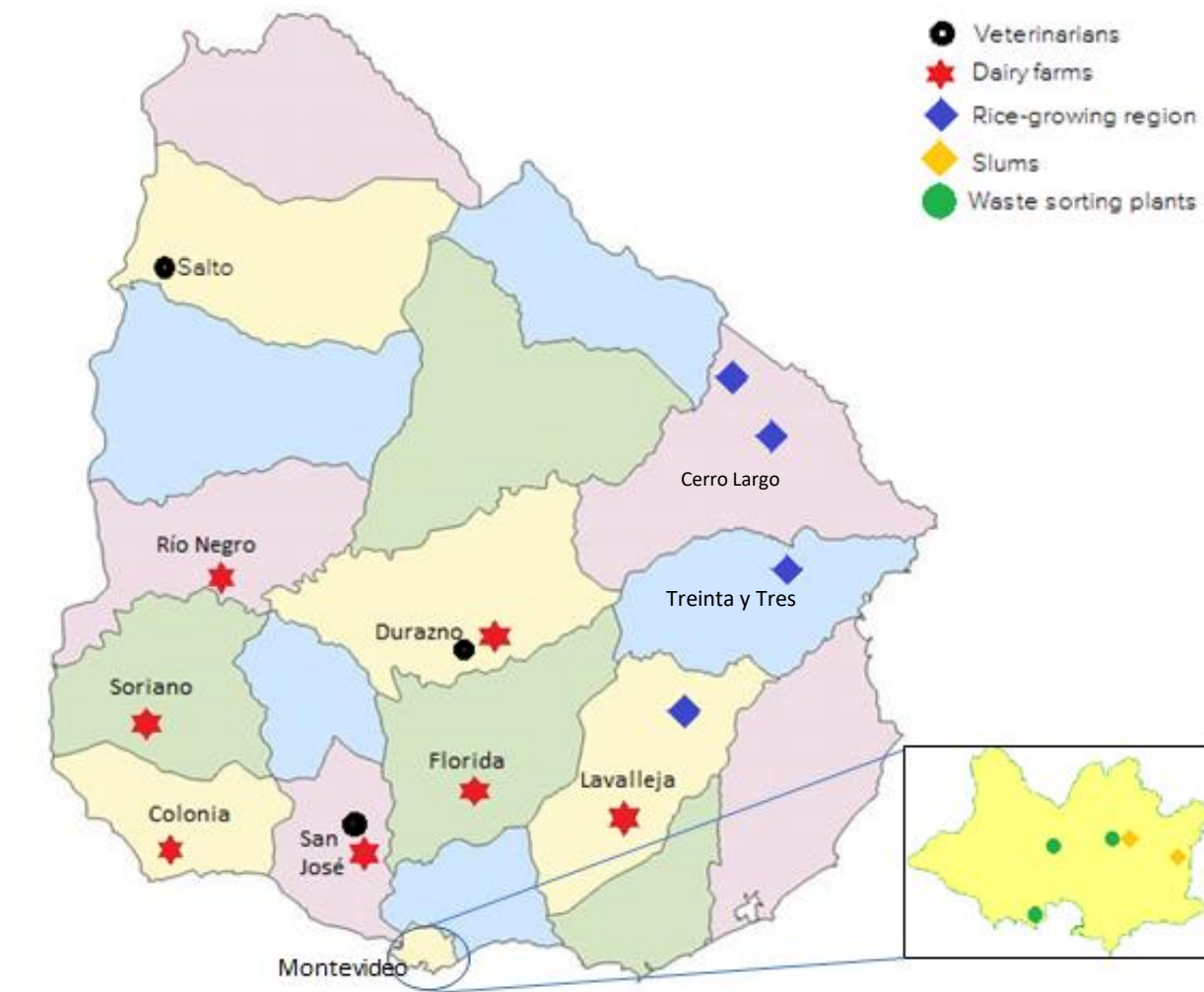


Image 1. Sampling map

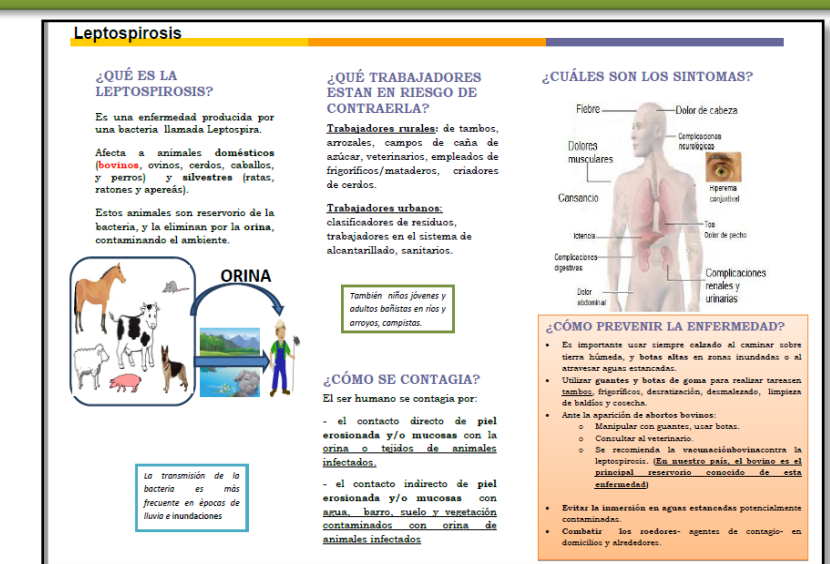


Image 2. Informative triptych

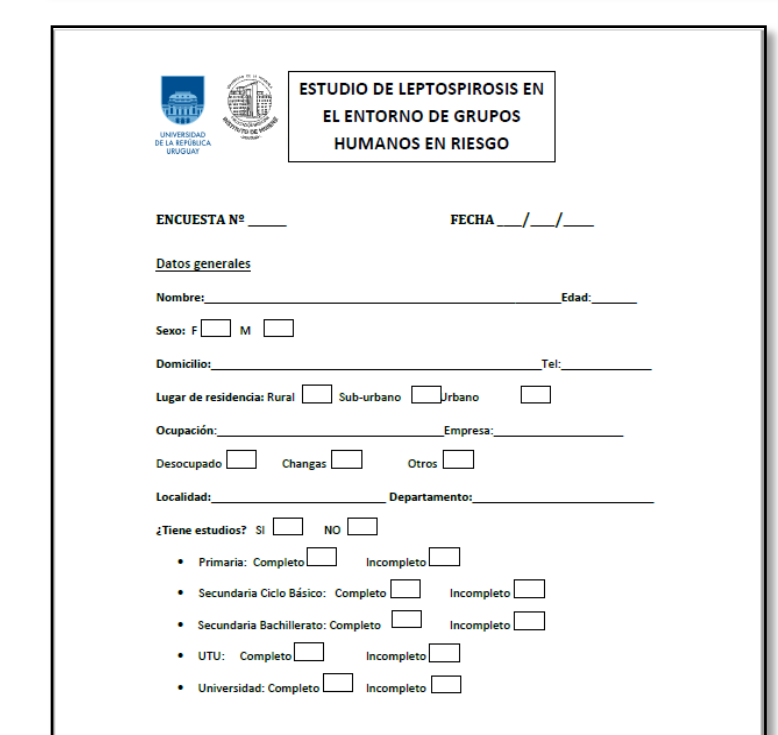


Image 3. Inquiry about risk factors

**Results.** IgM indirect immunofluorescence (IFI) and Micro-Agglutination Test (MAT) revealed a high frequency of previous contact with *Leptospira*. Highest values were observed in slum inhabitants and specially in dairy farm workers

MAT	Human serum samples	Percentage of total realized (%)
NOT REACTIVE	267	87.8
REACTIVE or POSITIVE	37	12.2
TOTAL	304	100.0

Table 1. MAT in the total of workers' sera. *Reactive*: two or more serovars with title 50, or one or more serovars with title 100. *Positive*: title ≥400 or seroconversion.

IFI	Human serum samples	Percentage of total realized (%)
NEGATIVE	163	62.0
POSITIVE	100	38.0
TOTAL	263	100.0

Table 2. IgM Indirect Immunofluorescence in workers' sera.

MAT	IFI		
	NEGATIVE	POSITIVE	TOTAL
NO TITLE	149	80	229
REACTIVE or POSITIVE	14	20	34
TOTAL	163	100	263

Table 3. Relationship between IFI and MAT for 263 workers' sera.

GROUP	MAT			PERCENTAGE POSITIVE (%)
	NOT REACTIVE	REACTIVE AND POSITIVE	TOTAL	
SLUMS	12	7	19	36.8
URBAN WASTE RECYCLER	85	2	87	2.3
RICE WORKER	108	19	127	15.0
DAIRY FARMER	20	6	26	23.1
VETERINARIAN	30	3	33	9.1
OTHER	12	0	12	0.0
TOTAL	267	37	304	12.2

Table 4. MAT in workers' sera, by groups. (p<0.001)

GROUP	IFI			PERCENTAGE POSITIVE (%)
	NEGATIVE	POSITIVE	TOTAL	
SLUMS	4	15	19	78.9
URBAN WASTE RECYCLER	51	27	78	34.6
RICE WORKER	82	44	126	34.9
DAIRY FARMER	7	9	16	56.3
VETERINARIAN	12	3	15	20.0
OTHER	7	2	9	22.2
TOTAL	163	100	263	38.0

Table 5. IFI in workers' sera, by groups. (p<0.001 when regrouped in 4 groups with similar percentage)

GROUP	UNFAVORABLE EVENTS (percentage)		
	One or neither	Two or more	Total
SLUM	66.7	33.3	100.0
URBAN WASTE RECYCLER	26.4	73.6	100.0
RICE WORKER	24.4	75.6	100.0
DAIRY FARMER	4.0	96.0	100.0
VETERINARIAN	9.1	90.9	100.0
OTHERS	41.7	58.3	100.0
TOTAL	24.8	75.2	100.0

Table 6. Unfavorable events, organized by group of workers (p<0.001).

An indicator was formulated to detect **unfavorable working conditions**, combining the following variables: cleaning in sheds and deposits, work in spaces with rodents, rodent manipulation, activities with farm animals and contact with their urine. The created categories were:

- Presence of an unfavorable event
- Presence of 2, 3, 4 or 5 (all) unfavorable events
- Neither

Seroprevalence in dogs was **22.9%**, but in horses it was unexpectedly high (**81.8%**), deserving further studies

Bovine urine cultures yielded only one *L. interrogans* isolate from a dairy establishment with confirmed cases of human leptospirosis. Water samples mainly contained non-pathogenic *Leptospira*<sup>2</sup>

## Conclusions.

1. These results confirm an elevated infection rate in human risk groups, and suitable environmental conditions for spread of pathogenic strains.
2. The finding of non-pathogenic leptospires in water suggests that there are also favorable environmental conditions for the circulation of serovars with pathogenic capacity.
3. The study of animals revealed the frequent presence of infective contact in horses, which motivates our intention to program their organized study.

### References

- 1- Meny P, Hernández E, Schelotto F, Varela G. *Valoración de un procedimiento de inmunofluorescencia indirecta para la detección de anticuerpos tipo IgM (IF-IgM) utilizado en el diagnóstico temprano de leptospirosis.* (Evaluation of an IgM IFI procedure for early antibody detection in Leptospirosis diagnosis) Rev. Médica del Uruguay. 2014; 30: 88–92.  
 2- Meny P, Menéndez C, Ashfield N, Ríos C, Quintero J, Schelotto F, Varela G, Zaranonelli L, Nieves C, Buschiazio A, Suanes A, Buroni F, Salaberry X, Rivero R, Briano C, Dutra F, Fraga M and Riet-Correa F *Leptospira* isolates from rural workers, abattoirs and infected bovine herds in Uruguay. 10<sup>th</sup> International Leptospirosis Society Meeting 27 Nov – 1 Dec 2017, New Zealand