

**EFEK CUACA DAN BANJIR TERHADAP SEBARAN SPASIAL-
TEMPORAL KEJADIAN LEPTOSPIROSIS DI KABUPATEN BANTUL
TAHUN 2010-2018**

ABSTRAK

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Latar belakang : Dekade terakhir, efek variabilitas iklim dan kejadian cuaca ekstrem mampu menggeser pola geografis dan trend penyakit menular, termasuk leptospirosis. Leptospirosis sebagai *neglected tropical disease* membutuhkan perhatian global terkait hubungannya dengan perubahan iklim, banjir, pertumbuhan penduduk dan urbanisasi. Pemanfaatan analisis spasial-temporal berbasis SIG mampu mendeteksi pola sebaran kasus leptospirosis, prediksi beban penyakit akibat iklim, alokasi sumberdaya dan perencanaan program kontrol dan surveilans yang efektif di daerah endemis.

Tujuan : Menganalisis efek cuaca (suhu, kelembapan, curah hujan) dan banjir terhadap sebaran spasial-temporal kejadian leptospirosis di Kabupaten Bantul tahun 2010-2018.

Metode : Penelitian studi ekologi ini dilakukan di Kabupaten Bantul, Yogyakarta selama periode 9 tahun. Analisis spasial-temporal menerapkan model *space-time permutation* dari SaTScanTM, uji korelasi Pearson dan korelasi *time-lag* dari STATA, dan grafik *time-series*.

Hasil : *Most likely cluster* ditemukan di tiap tahun 2010 dan 2018, serta multi tahun 2010-2012 dan 2010-2018. Tiga dan dua dari 75 desa masing-masing dilaporkan endemis dan non-endemis leptospirosis selama periode studi. Banjir pasca badai siklon diikuti peningkatan kasus leptospirosis pada tahun 2017. Secara temporal, korelasi tertinggi terjadi pada suhu udara 3 sebelumnya ($r=0.2493$), kelembapan udara 1 bulan sebelumnya ($r=0.2921$), curah hujan 3 bulan sebelumnya ($r=0.5297$) dengan kejadian leptospirosis.

Kesimpulan : Sebaran kejadian leptospirosis mengelompok secara spasial-temporal. Kejadian leptospirosis berhubungan dengan efek *time-lag* suhu, kelembapan dan curah hujan yang terjadi beberapa bulan sebelumnya. Diperlukan sistem kewaspadaan dini pemerintah dan masyarakat di daerah endemis menghadapi ancaman leptospirosis selama musim hujan.

Kata kunci : *cuaca; banjir; clustering; spasial-temporal; leptospirosis*

**EFFECTS OF WEATHER AND FLOOD ON SPATIOTEMPORAL
DISTRIBUTION OF LEPTOSPIROSIS IN BANTUL DISTRICT,
2010-2018**

ABSTRACT

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Background : Last decade, effects of climate variability and extreme weather events have been able to shift the geographical pattern and trend of human infectious diseases, including leptospirosis. Leptospirosis as neglected tropical disease requires global attention related to its relationship with climate change, flooding, population growth and urbanization. Utilization of GIS-based spatiotemporal analysis may help detecting distribution patterns of leptospirosis cases, predicting of disease burden due to climate, allocating resources and planning an effective control and surveillance programs in endemic areas.

Objective : To analyze the effects of weather (temperature, humidity, rainfall) and flood on spatiotemporal distribution of leptospirosis in Bantul District, 2010-2018.

Method : This ecological study was conducted in Bantul District, Yogyakarta for 9-year period. Spatiotemporal analysis applies space-time permutation model by SaTScanTM, Pearson's correlation and time-lag correlation by STATA, and time-series graphs.

Results : Most likely clusters are found in 2010, 2018, multi years 2010-2012 and 2010-2018. 3 and 2 of 75 villages were reported as endemic and non-endemic leptospirosis during study period. Post cyclone floods were followed by increase leptospirosis cases in 2017. Temporally, the highest correlation showed significant positive with 3-month lag of temperature ($r=0.2493$), 1-month lag of humidity ($r=0.2921$), 3-month lag of rainfall ($r=0.5297$) within leptospirosis cases.

Conclusion : Distribution pattern of leptospirosis is spatiotemporally clustered. The incidence of leptospirosis is correlate to time-lag effect of temperature, humidity and rainfall that occurred previous months. Early warning systems are required by government and inhabitant in endemic areas facing the threat of leptospirosis during the rainy season.

Keywords : weather; flood; clustering; spatial-temporal; leptospirosis