

infected urine, and can lead to outbreaks in animals and humans who are exposed to the contaminated water.

**Conclusion:** As risk factors include human, agricultural and environmental exposure, an effective prevention program should address all three sectors, which is a One Health approach.

Specific recommendations were formulated for each risk factor in order to prevent transmission.

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### Brucellosis in Cameroon: Seroprevalence and risk factors in beef-type cattle



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**Purpose:** Bovine brucellosis is a well-known zoonosis which also has profound negative impacts on cattle productivity and on international trade. In this study we aimed at investigating seroprevalence and possible risk factors associated to seropositivity of bovine brucellosis in two agro-pastoral ecologic zones of Cameroon: the Western Highland Plateau Savannah (WHPS) and the Guinea Highland Savannah (GHS) as they encompass the most productive regions in the country in terms of cattle production.

**Methods & Materials:** The subdivision and village herds were considered as clusters for a two-stage cluster sampling procedure. To enable us to sample animals by probability proportional to size, cattle population of each village (cluster) was noted against the corresponding village. Each beef-type cattle in Cameroon was assigned to a single cluster (village). Using C-survey 2.0 a final list of villages to be visited was established. Blood samples were collected and screened using the Rose Bengal Plate Test. A field questionnaire was designed and distributed to herd managers during sampling to collect information on intrinsic risk factors (age, sex and breed) and extrinsic risk factors (ecological zone, herd size, herd management system, third trimester abortion, interaction with wildlife, and interaction with sheep and goats during grazing) that can affect *Brucella* sero-status of the target population. Data generated from the field questionnaire were tested for significance against seropositivity using ANOVA and Chi-Square in R-Software<sup>®</sup>.

**Results:** The results of this work confirm that bovine brucellosis is endemic in Cameroon. With an uneven but wide distribution the study revealed a 4.61% and 16% seroprevalence at the animal-level and herd-level respectively. There was a preponderance of seropositivity in the GHS (87.5%) over the WHPS (12.5%). The extrinsic risk factors investigated were all positively correlated with seropositivity. It was interesting to note that cattle interactivity with sheep and goats (small ruminants), wildlife, herd size, administrative division, history of third trimester abortion, ecological zone, and herd management systems had significant effects on seropositivity.

**Conclusion:** To the best of our knowledge, these findings provide the first factual insight into the seroprevalence of bovine brucellosis and some of its associated risk factors in the most livestock-productive agro-pastoral ecozones of Cameroon.

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### Chronic opisthorchiasis: Current situation in the Republic of Kazakhstan



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**Purpose:** Aim: to investigate prevalence of human opisthorchiasis in natural foci of Kazakhstan for 2009–2014.

**Objectives:** 1) to study prevalence of opisthorchiasis in Kazakhstani population; 2) to perform time series analysis, considering ecological zones and administrative division of Kazakhstan.

**Methods & Materials:** Consolidated reports 1, 2 of Ministry of Healthcare of Kazakhstan and data provided by Agency for population statistics of Kazakhstan. Statistical methods: 1) analysis of intensive values; 2) analysis of time series (average annual growth / decline rate (AAG/DR,%); 3) 95% confidence interval (CI)  $1.96 \times SE$  (CI)

**Results:** From 2009 to 2014, average annual incidence rate was  $12.24 \pm 0.86^0/0000$  (95% CI = 10.56–13.92<sup>0</sup>/<sub>0000</sub>). Trends of adjusted incidence rates of helminthiasis increased in Akmola (AAGR = + 19.18%), Kostanay (AAGR = + 16.9%), Aktobe (AAGR = + 15.7%) regions. In other regions morbidity trends declined, with average annual decline of adjusted incidence rates ranging from AADR = -1.84% in West Kazakhstan to AADR = -24.5% in North Kazakhstan.

Significant heterogeneity in distribution of incidence in various regions was observed, caused by specific lifecycle of *Opisthorchis*, prevalence of intermediate hosts of helminthiasis in reservoirs, large country area, including 9 water basins.

Current investigation revealed Ural, Caspian, Irtysh, Ishim, Tobol, Turgay basins (from 18.2<sup>0</sup>/<sub>0000</sub> and 8.08<sup>0</sup>/<sub>0000</sub>) to be regions with high and medium levels of morbidity of opisthorchiasis. They are located in north-western and north-eastern parts of Kazakhstan and are co-integral parts of the two world's largest natural foci of opisthorchiasis - Ob-Irtysh and Volga-Kama.

Nura-Sarysu water basin and Almaty were determined to be regions with low indices (up to 0.08<sup>0</sup>/<sub>0000</sub>). However, majority of cases in Almaty were imported, with no tendency of morbidity reduction due to increase in population migration, trade and economic processes. Imported cases and infection of local population in Ishim water basin area were identified in Astana (23.25<sup>0</sup>/<sub>0000</sub>).

**Conclusion:** Uniqueness of natural environment and specificity of hydrological regime ensure stable functioning of opisthorchiasis foci. Despite the dynamic decline in morbidity during 2009 to 2014 in total population, a steady level of newly diagnosed patients with opisthorchiasis in northern and central regions of Kazakhstan remains.

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