OVERVIEW OF ENZOOTIC BOVINE LEUKOSIS IN LITHUANIA 2017 – 2019

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Introduction

Enzootic bovine leukosis is a disease of cattle caused by bovine leukemia virus (BLV). According to the 2018 report, 22 countries in Europe, including Lithuania, successfully demonstrated freedom from EBL (1). In 1986 serological investigations together with an eradication were initiated in Lithuania. EBL eradication program was successful and seroprevalence of infected cattle herds steadily decreased from 7.29 % in 1990 to less than 0.2 % from 2012 (2). Nevertheless, following active disease surveillance, the EBL is still present in Lithuania. A detailed retrospective analysis of EBL outbreaks is useful to develop new strategies to decrease the prevalence of the disease and improve national surveillance program not only in Lithuania but also in other countries where EBL is still not fully eradicated.

Objectives

- To describe regional pattern of EBL 2017 – 2019 outbreaks in Lithuania;
- To analyze the difference between BLV infected and non-infected cattle and find possible risk factors associated to EBL;

Materials and Methods

- Data of EBL outbreaks 2017 – 2019 in Lithuania was obtained from National animal health database and ADNS (animal disease notification system);
- Study population and time: 69 EBL infected cattle herds in 2017 - 2019: 206 EBL seropositive cattle. 21 EBL infected cattle herds in 2019: 180 tested cattle (27 EBL seropositive, 153 EBL seronegative cattle);
- Logistic regression was used to construct a multivariable model of variables with $p<0,05$ (“Animal Test”, “Age”, “Animal Movement” of infected and noninfected cattle in outbreak herds of 2019).

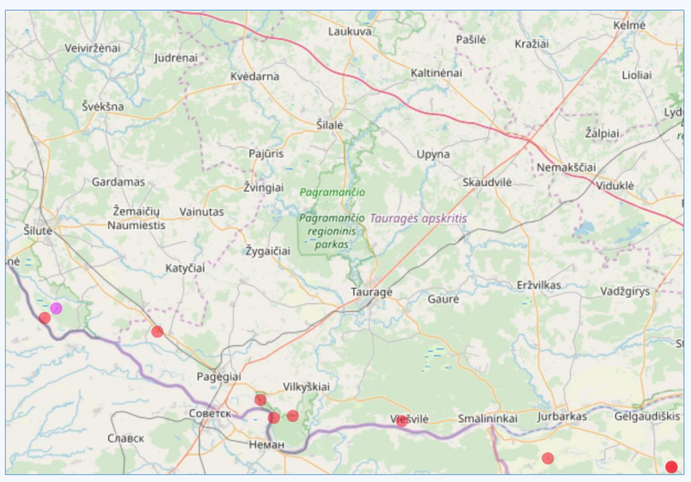

Fig. 2. EBL outbreaks 2017 – 2019 in Tauragė district

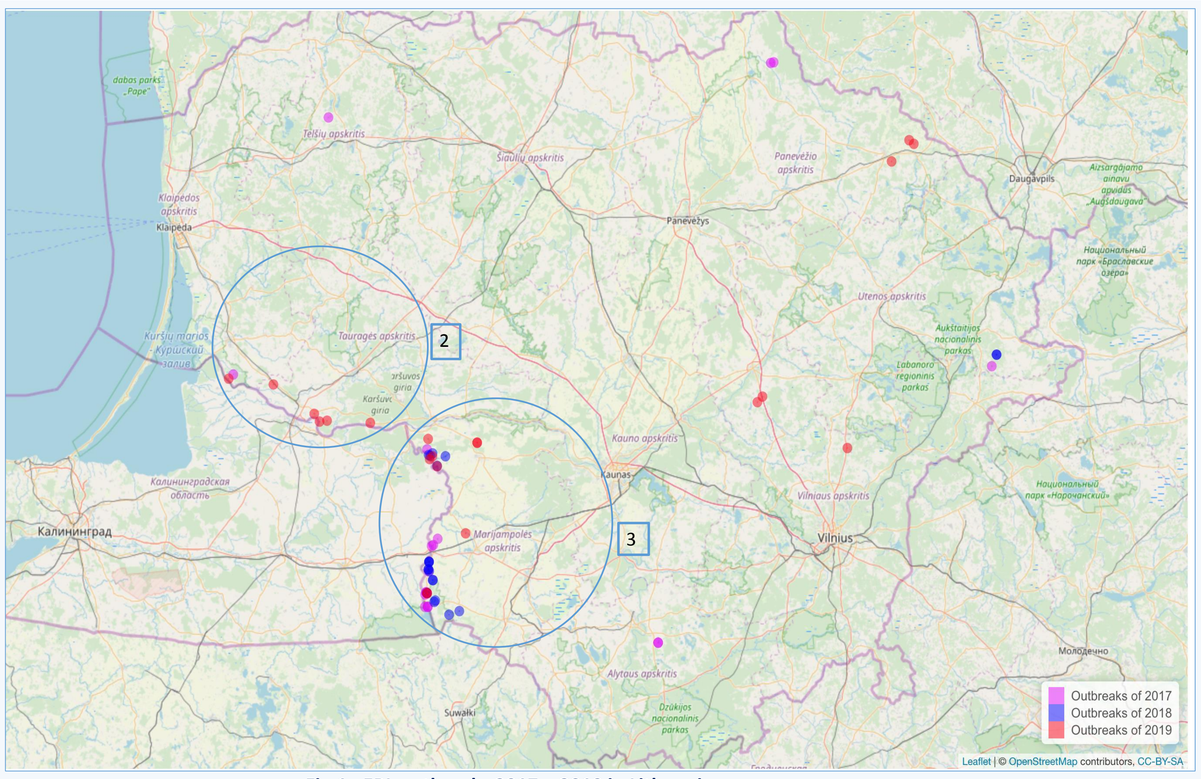

Fig.1. EBL outbreaks 2017 – 2019 in Lithuania

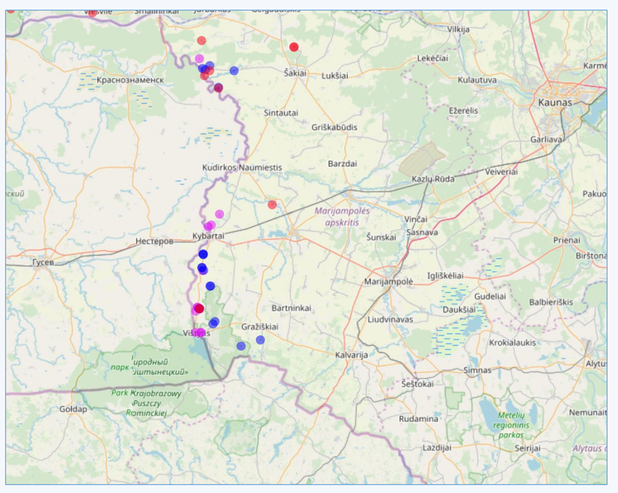

Fig. 3. EBL outbreaks 2017 – 2019 in Marijampolė district

Table 1. Assessment of risk factors of EBL by logistic regression in Lithuania 2017 - 2019

Variables	β coefficient	p value	OR[1]	CI[2]	
				2.5 %	97.5 %
Age	1.89	0.00822	1.02	1.01	1.03
Animal Test	2.57	0.03974	1.05	1.01	1.09
Animal Movement	1.78	0.00284	4.67	1.61	14.23

1- odds ratio, 2- confidence interval

Results

Regional pattern of EBL outbreaks 2017 – 2019 is showed in map (fig. 1). The majority of outbreaks (49 of 69) is concentrated in south – west of Lithuania (districts of Marijampolė and Tauragė). During 2017 – 2019 period in Marijampolė district there were 40 outbreaks of 69 (fig. 3), in Tauragė district 9 outbreaks of 69 (fig. 2). Other 20 of 69 EBL cases in 2017 – 2019, distributed individually in the territory of Lithuania.

Multivariable logistic regression analysis showed three variables ($p<0.05$) associated with the seropositivity of EBL (Table 1). According to the data, the risk of cattle being seropositive increases with age (OR= 1.01, 97.5% CI 1.01 to 1.03). Also, model showed that if the duration in between EBL testing prolongs, the odds for cattle being seropositive is higher (OR=1.05, 97.5% CI 1.01 to 1.10). The odds for seropositivity were higher for cattle who has been imported to the outbreak herd (OR=4.67, 97.5% CI 1.61 to 14.23).

Discussion and future work

The EBL outbreaks of 2017 – 2019 are mostly clustered in south – west of Lithuania. This area is just next to the border with Russian Federation (RF), the district of Kaliningrad, where the prevalence of EBL is unknown. According to the ADNS data, there is an obvious cluster of EBL outbreaks in Poland next to the border with RF. Nevertheless, there is no significant evidence that the occurrence of these clustered EBL outbreaks in Lithuania and Poland next to the border of RF is related. At the moment, outbreaks of Marijampolė and Tauragė districts requires comprehensive research to find out the causes of outbreaks and to prevent further disease spread.

The multivariate logistic regression model showed that the odds of cattle being EBL seropositive increases with age, prolonged period between EBL testing and with animal movement. Although, we are not able to predict the disease with three associated risk factors.

References
1 - EC “Bovine and swine diseases situation 2017”, 2018
2 - J. Acaite et al., "The eradication experience of enzootic bovine leukosis from Lithuania", 2007

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