EVOLUTION OF RABIES WORLDWIDE AND ITS RELATIONSHIP WITH THE CHARACTERISTICS OF THE COUNTRIES

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Introduction

Rabies is a zoonotic disease that causes about 59.000 deaths every year, mainly in Asia and Africa, despite the fact that the post-exposure treatment is very effective.

It is endemic in all continents but Oceania and Antarctica, though some countries such as Western Europe and Canada, among others, have achieved the eradication of dog-mediated rabies from their territories.

Objectives

The main objective is to determine the demographic, geographic and economic factors related to the presence or absence of rabies in the countries

Furthermore, we want to see the temporal evolution of rabies worldwide.

Materials and methods

The rabies status of each country was obtained from the OIE website (www.oie.int), and it was connected with some geographic, demographic and economic characteristics of the countries.

The presence of rabies in dogs was obtained from a 16 years period and it was divided in four periods (2005-2009, 2010-2014, 2015-2018, 2019-2020) , while two periods were used to define the status of rabies in wildlife (2005-2018 and 2019-2020).

A logistic regression was performed using Deducer-R to establish the relationships between the presence or absence of rabies and some characteristics of the countries

Results

Between 2005 and 2009 there were 141 countries (72%) that had rabies in dogs, while in 2019 there were just 104 (53%), as you can see in figure 1.

The most significant factors are the continent, area, whether it is an isle or not and having infected wildlife nowadays (Table 1).

Africa is the continent with the highest odds of having a country with rabies, while in mainlands the odds are higher than in islands (Table 2).

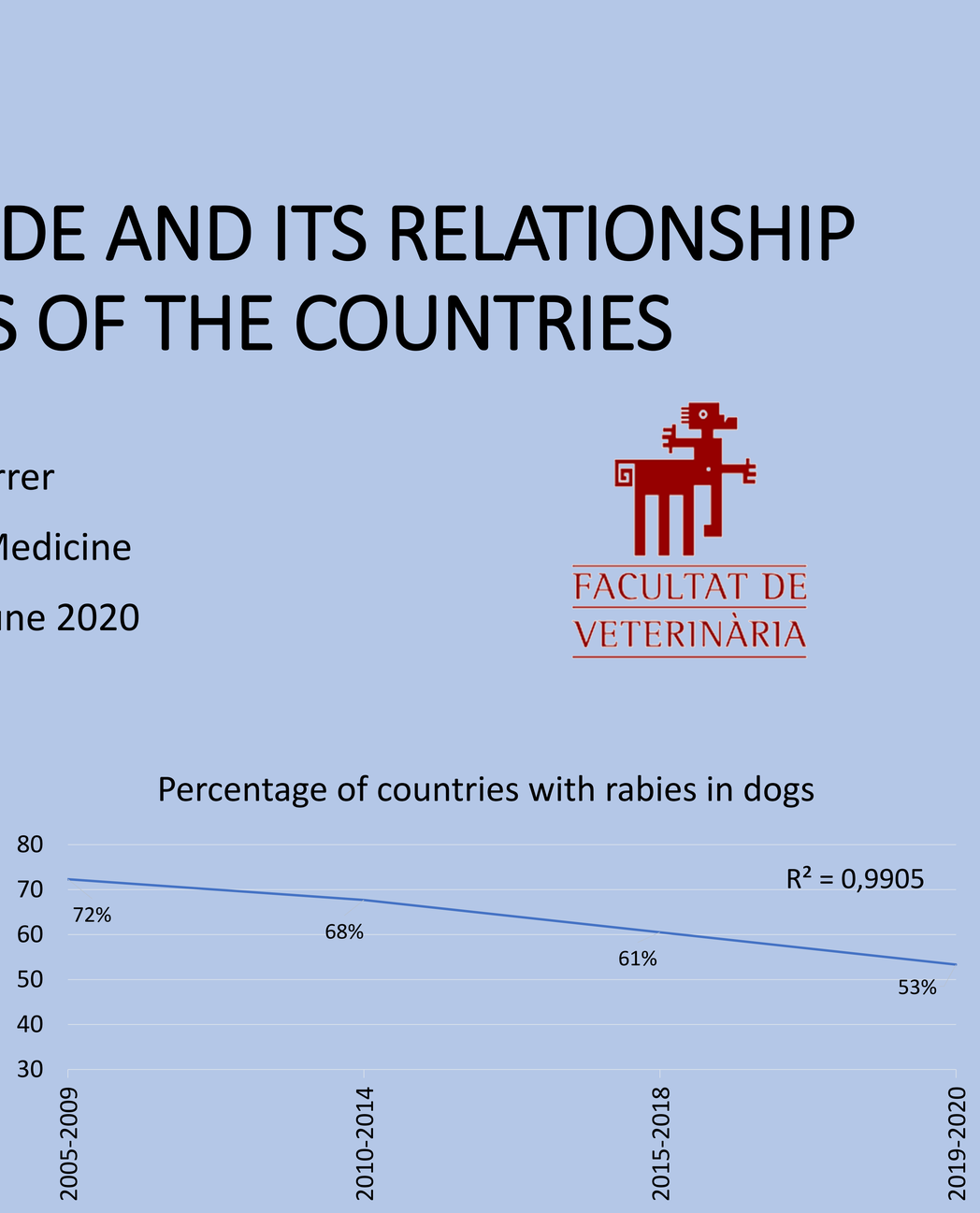

Figure 1. Evolution of the percentage of countries that have rabies in dogs.

Table 1. P-values of each factor obtained in the logistic regression.

Factor	P-value
Rabies in wildlife nowadays	0,003
Population	0,89
Population density	0,27
GDP per capita	0,74
Area	<0,001
Continent	<0,001
Hemisphere	0,94
Meridian	0,92
Island/Continental territory	<0,001

Table 2. Odds ratio (OR) of the “continent” and “island” factors. Oceania was not included since all of the countries were negative

Factor	OR	IC 95%
Europe	1	NA
Africa	45	24-84,1
America	18,8	9,9-35,4
Asia	28,5	15,4-52,7
Oceania	NA	NA
Islands	0,093	0,06-0,15

Conclusions

Countries with cases of dog-mediated rabies are mostly located in Asia and Africa, while Islands are less affected than mainlands.

Additionally, currently having infected wildlife (p-value=0,003) also has a huge influence.

Regarding the temporal evolution of the disease, there is a clear reduction of the number of countries that declare having dog-mediated rabies in their territory and the WHO/OIE goal of eliminating human rabies transmitted from infected dogs could become a reality in 2030.