

## Transmission of Crimea Congo Hemorrhagic fever in Albania

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### Abstract

The aim of this study is to identify possible causative agents that have a role in the transmission and spread of Crimean Congo hemorrhagic fever in different areas in Albania, to determine the impact of factors and to evaluate the clinical forms of the disease in Albania. This study was conducted at the Institute of Public Health in Tirana in cooperation with the University Hospital Mother Teresa in Tirana and with district hospitals (Kukes, Has, Ersekë, Berat) where cases with CCHF were found. This is a retrospective study, where all the data was taken from the Institute of Public Health in Tirana and clinical records of the patients. It will be given a clear picture of the spread of Crimean Congo hemorrhagic fever in Albania in the period of time from 2000 to 2016. We have identify and analyzed the risk factors that have a role in the spread of the disease in humans, we found the type of ticks that transmit the disease and we evaluate the clinical condition of the patients with CCHF. In Albania two outbreaks of Crimea Congo hemorrhagic fever was occur, the first outbreak was seen in 2003 and the second outbreak was seen in 2010. The majority of the cases was from Has and Kukes. The seasonality was related with the spread of the disease. The high-risk groups are people that live in rural area and work in agriculture and animal husbandry.

**KEYWORDS:** CCHF, risk factors, Albania.

### Introduction.

Crimean-Congo hemorrhagic fever (CCHF) is a human disease with a high case fatality rate. The virus of Crimean - Congo hemorrhagic fever (CCHFV) is spread by ticks and humans contract. It is the most geographically widespread tick-borne viral infection of humans, occurring from western China through southern Asia and the Middle East to southeastern Europe and Africa. There is currently no commercially available vaccine and no specific treatment.

Albania is a small country situated on southeastern Europe's Balkan Peninsula. As other countries of Balkan, even Albania has reported cases with Crimean-Congo hemorrhagic fever. The first case of CCHF found in Albania was in 1986.

Outbreaks of CCHF are seen in different countries in Balkan. In Albania, from 1986 (were the first case of CCHF was found), to 1990 two outbreak of CCHF are described. An outbreak of CCHF was described in 1986-1987, and another one in 1989.

Since 1990, sporadic cases of CCHF have been reported each year. The majority of cases was found in Has and Kukes district. The following data were obtained from the Epidemiology Office in Kukes (Table 2)

Year	Nr. CCHF	Period of occurrence
1993	7	June – September
1994	3	May – July
1995	1	March
1996	2	June-August
1997	0	-
1998	1	June
1999	0	-

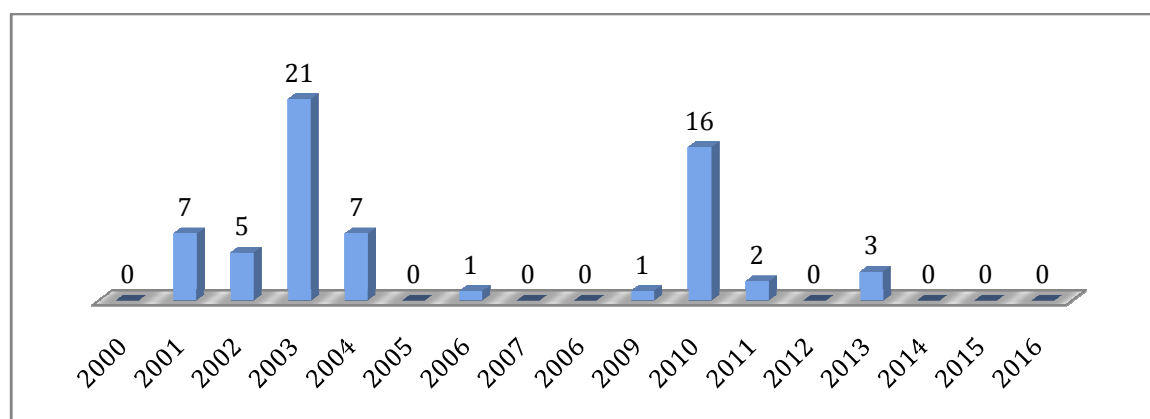
Table 1. Geographic distribution of CCHF in Albania from 1993 to 1999 (Source: Epidemiologist Office in Kukës)

### Methodology

This is a retrospective study, in which we give a clear picture of the epidemiology of CCHF in Albania. This is a descriptive study, where cases confirmed with CCHF from January 2000 to December 2012 were taken. The data were collected from the Institute of Public Health in Tirana and from the clinical records of patients. After the identification of cases confirmed with CCHF, data as age, gender, occupation, living environment (rural/urban), period of disease, signs and symptoms, laboratory findings and prognosis of the disease were collected. After the identification of the districts with the higher cases of CCHF, we analyzed various characteristics of these districts, regarding geographic position, seasonality, the use of agriculture, economic level of the patients and the diversity of bird species in that area. A map with the distribution of cases with CCHF in Albania was produced.

### Results

In this retrospective study where we collect all the data from the Institute of Public Health in Tirana and from the clinical records of patients; we found that the number of cases confirmed with Crimean-Congo hemorrhagic fever from 2000 to 2012 is sixty.



Graphic 1. The distribution of cases with CCHF from 2000 to 2016 in Albania

As we can see from Graphic 1, there are two outbreaks of cases with CCHF in Albania from 2000 to 2012. The first outbreak was in 2003. In this year 21 cases of CCHF were confirmed, and the most part of them were from Has. From 21 cases represented in 2003, 16 of them belong to the same clan members.

The second outbreak was reported in 2010, where 16 cases or 27% of all cases with CCHF were found. Even in 2010 the majority of patients was from Has and Kukës.

In 2001 and in 2004 we have 7 cases confirmed with CCHF. In 2002 only 5 cases with CCHF were confirmed. No cases are reported in the other years.

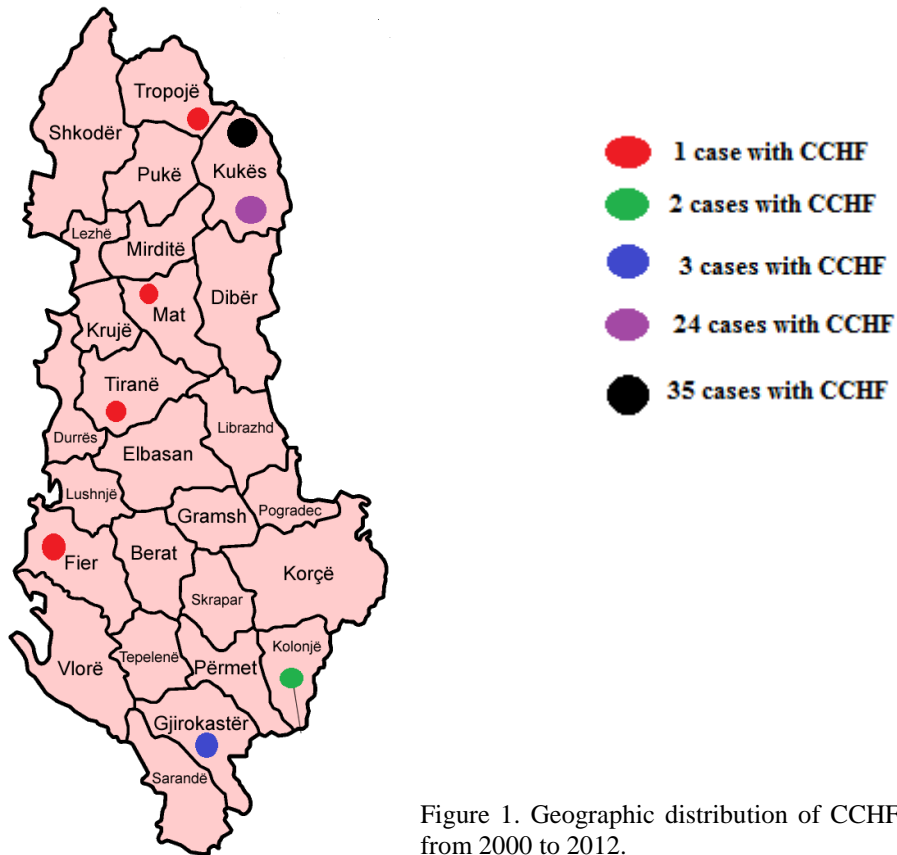
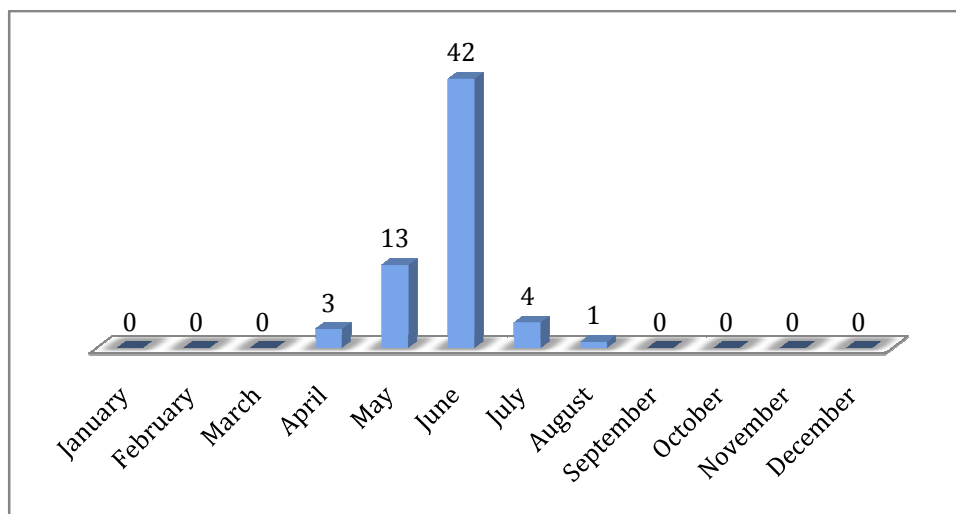


Figure 1. Geographic distribution of CCHF in Albania from 2000 to 2012.

In the figure 1 we have represent the geographic distribution of cases with CCHF in Albania from 2000 to 2012. As we can see from figure 1 the district more affected by CCHF is Has which report 35 cases, followed by Kukes with 24 cases.

Almost all cases are concentrated in these districts.

Districts that have only 1 case are Tropoja, Mat, Tirana and Fier, 2 cases are seen in Kolonja and 3 cases in Gjirokaster. In the other districts is not seen any case(see figure 5).



Graphic 2. The distribution of cases with Crimean Congo hemorrhagic fever by months

Graphic 2 represent the distribution of cases with CCHF by month. As we can see the month with more cases is June which has 40 cases or 67% of all cases. In May we found 12 cases or 20%, in April 3 cases, in July 4 cases and in August 1 case. In other months was not observed any case of CCHF.

### **Discussion**

Previous reports have documented a wide geographical distribution of CCHF virus ranging from Eastern Asia to Africa and Europe with 15-60% mortality rates (Vorou 2009). The first human case of CCHF in Albania was described in 1986. A total of 35 suspect or confirmed cases were reported between 1986 and 1990 (Anna Papa et al. 2008).

The first part of this study describes the epidemiological situation of cases with CCHF viruses in Albania from 2000 to 2012. As we can see from the results, there are two outbreaks in Albania, in 2003 with 21 cases or 35% of all cases with CCHF, and in 2010 with 16 cases. The majority of cases confirmed with CCHF were from Has and Kukes. Has and Kukes are two districts that are situated in northeastern part of Albania, which is close to Kosovo border. In Kosovo we have 2 outbreaks; one is in 2001 with 31 cases and in 2002 with 16 cases (Humolli et al. 2010).

As Has and Kukes are in borderline with Kosovo the outbreak in 2003 in Albania may have been influenced by Kosovo outbreak. This may have happened because sylvatic animals may have crossed the border and bring with it the spread of the ticks that are infected with CCHF. So the migration of animals from Kosovo to Albania may be a risk factor for the spread of ticks with CCHFV.

The majority of cases with CCHF in Albania are from Has and Kukes, both situated in the north-east part of Albania. The northeastern part of Albania is characterized by a Mediterranean climate with a hot dry summer. The average summer temperature is 23-24° C. Winter is wet with the possibility of frost. Rainfall is higher. These climatic conditions are suitable for crops such as maize, vegetables, forages, vines and fruit trees (Seim et al. 2012). Albania is one of the most vulnerable in the region to changing climate trends. In 15 years the weather has changed with the increasing temperatures (Menne 2012). These changes in climate and their resulting effects on agriculture have an impact on the spread of the disease, because tick activity and CCHF risk increase with rising temperature (Gray 2008).

Regarding the occupation of people that live in Has and Kukes, the majority of them are farmer and housewife. They work in agriculture and animal husbandry, as the geographic position and climate favor these two kinds of occupations.

Different studies have shown a higher prevalence of Hyalomma tick in sheep and cattle (Shemshad et al. 2012), (Dehaghi et al. 2011), (Liebisch 1997). Sheep and cattle are raised in Kukes and Has, which increases the possible contact of people with the animals and the ticks that have the virus of CCHF.

People working in agriculture and animal husbandry, has reported a high number of cases with CCHF in our study. Both of these occupation categories are at risk of tick contact. Other epidemiological studies have reported that CCHF is also frequent in

regions with forest, so living in rural areas has been described as a risk factor (Arikan et al. 2010), (Vançelik, Avşar, and Aktürk 2012), (Khurshid et al. 2015).

As we know tick activity and CCHF risk increase with rising temperature in spring (Gray 2008). In our study the cases with CCHF were reported in May with 12 cases or 20% of all cases and in June with 40 cases or 67% of all cases. May and June are the months with high temperature in Albania, and people that live in Has and Kukes work in agriculture and animal husbandry in this period. Also in this period of time, the Hyalomma ticks have the reproductive phase. So, the contact with Hyalomma ticks is this time is higher.

The seasonality, especially the period spring-summer, is a risk factor for the spread of CCHF virus as the contact with animals is higher and Hyalomma ticks have their period of reproduction. Different studies have reported the period spring-summer as a risk factor for the spread of CCHF (Chapman et al. 1991), (ANSARI et al. 2015).

### Conclusion:

As a conclusion from our study, we can say that Crimean-Congo hemorrhagic fever is high-risk in people that lives in rural area and work in agriculture and animal husbandry, especially during the months of May and June.

The Economic condition, geographic structure, climate and habitat had an important role in the distribution of the infection in Albania.

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