

# HUMAN ECHINOCOCCOSIS IN KYRGYZSTAN

## INCIDENCE AND GEOGRAPHICAL DISTRIBUTION

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## 1. SUMMARY

Human echinococcosis is a neglected parasitic zoonosis caused by tapeworms of the genus *Echinococcus*. Given that human echinococcosis is a serious threat to human health in Kyrgyzstan, we investigated its incidence and geographical distribution to target public health interventions and foster further research on potential associated risk factors in this country.

## 2. BACKGROUND

Human echinococcosis is global public health problem. It affects over one million people worldwide, with highest impact on pastoral communities.

The disease has a complex multi-host life cycle, and two main forms: **cystic echinococcosis (CE)** caused by *Echinococcus granulosus* s.l. and **alveolar echinococcosis (AE)** caused by *Echinococcus multilocularis*. Kyrgyzstan is considered hyperendemic for CE and is facing an emerging epidemic of AE.

## 3. METHODS

We **A** mapped all CE and AE surgical cases reported between 2014 and 2016 according to the patients' residence – the assumed location of the infection.

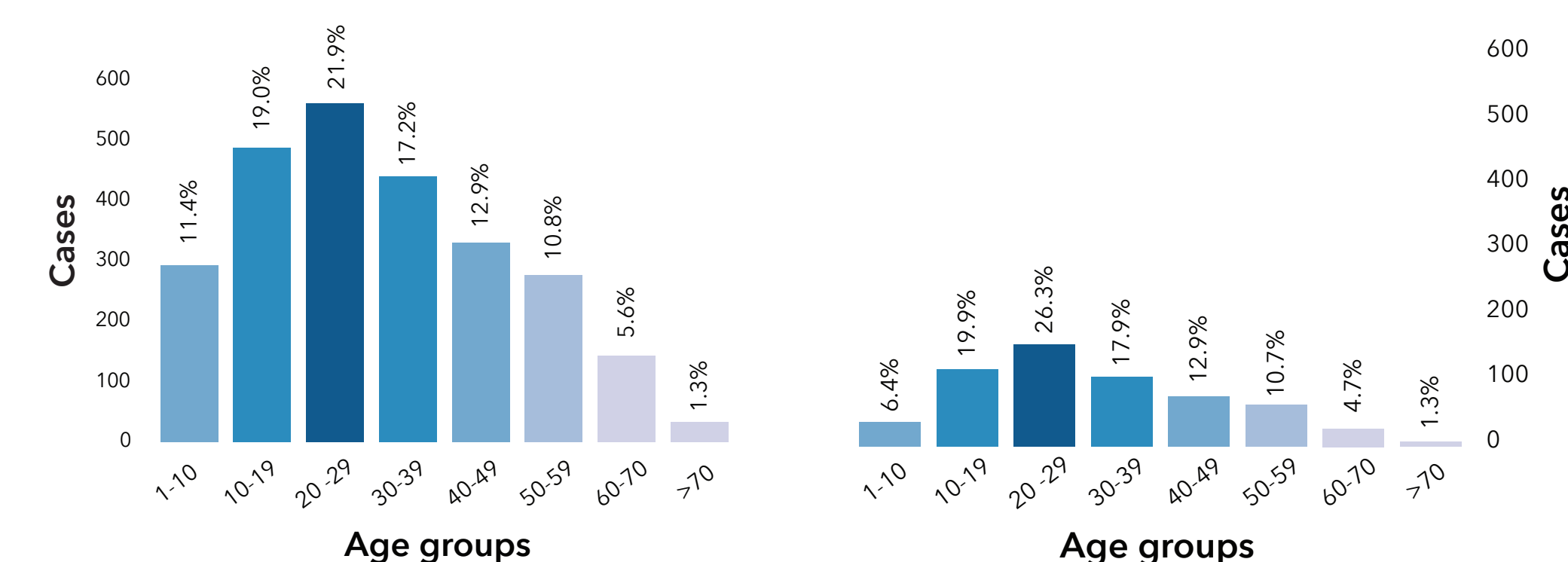
We then analyzed patients' demographics and **B** computed crude incidence rates (IR) and standardized incidence ratios (SIR) based on age and sex at country, regional, district, and local community levels.

Lastly, we tested the standardized ratios for **C** global and local spatial autocorrelation through the Moran's I statistics and the Local Indicators of Spatial Association (LISA) to identify disease hotspots.

## 4. RESULTS

### A REPORTED SURGICAL CASES (2014-2016)

Cystic Echinococcosis (CE)			Alveolar Echinococcosis (AE)				
	Total	2,536	100.0%	Total	598	100.0%	
	Relapses	204	8.0%	Relapses	52	8.7%	
Sex	Female	1,399	54.6%	Sex	Female	377	63.0%
	Male	1,164	45.6%		Male	221	37.0%



## 5. CONCLUSIONS

Our study provides an insight into the incidence and geographical distribution of the surgical cases of CE and AE in Kyrgyzstan. In particular, we estimated crude and standardized incidence rates and ratios, and assessed hotspots of human echinococcosis.

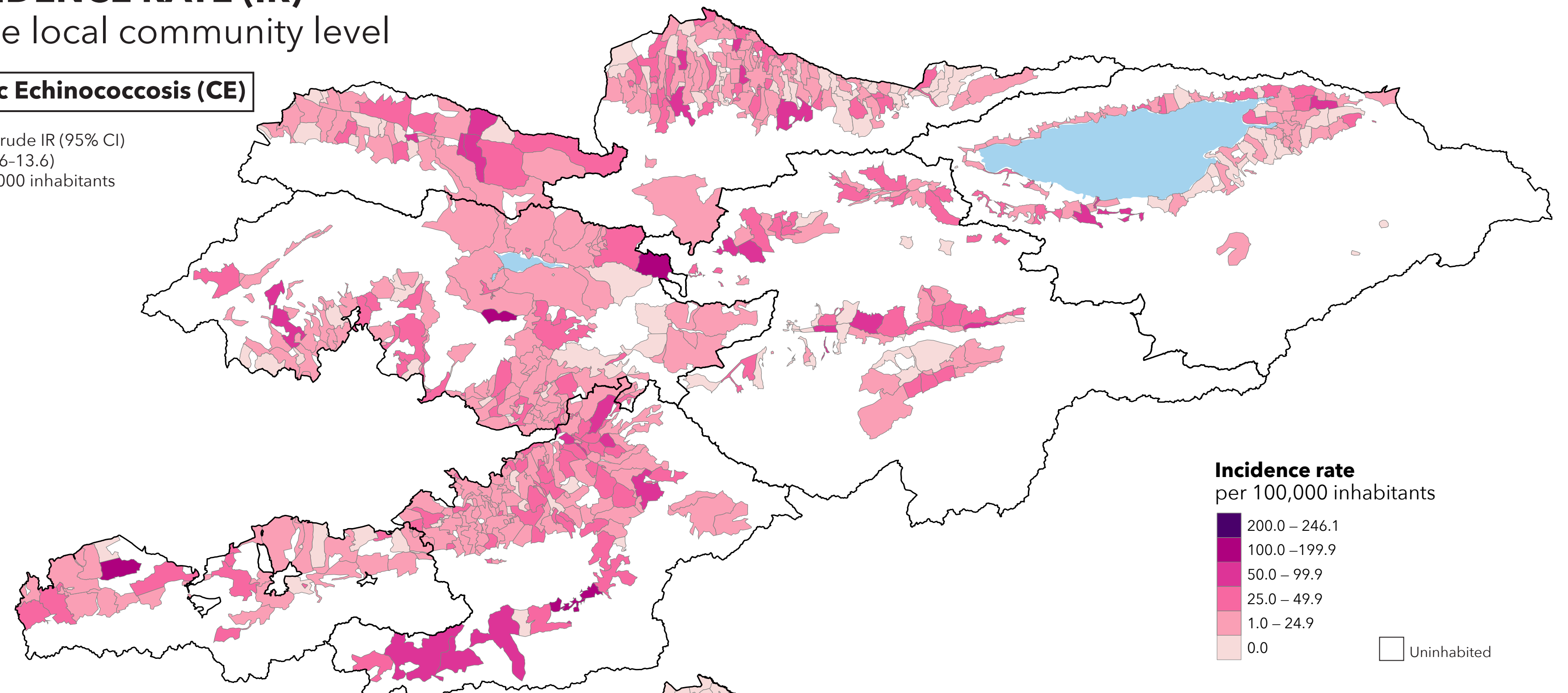
These findings raise awareness on this neglected zoonosis (e.g., encouraging reporting, increasing relevance to policy makers) and foster cost-effective public health interventions in hyperendemic regions.

Further research on risk factors and the ecology of the disease is needed to support human echinococcosis control.

### B INCIDENCE RATE (IR) at the local community level

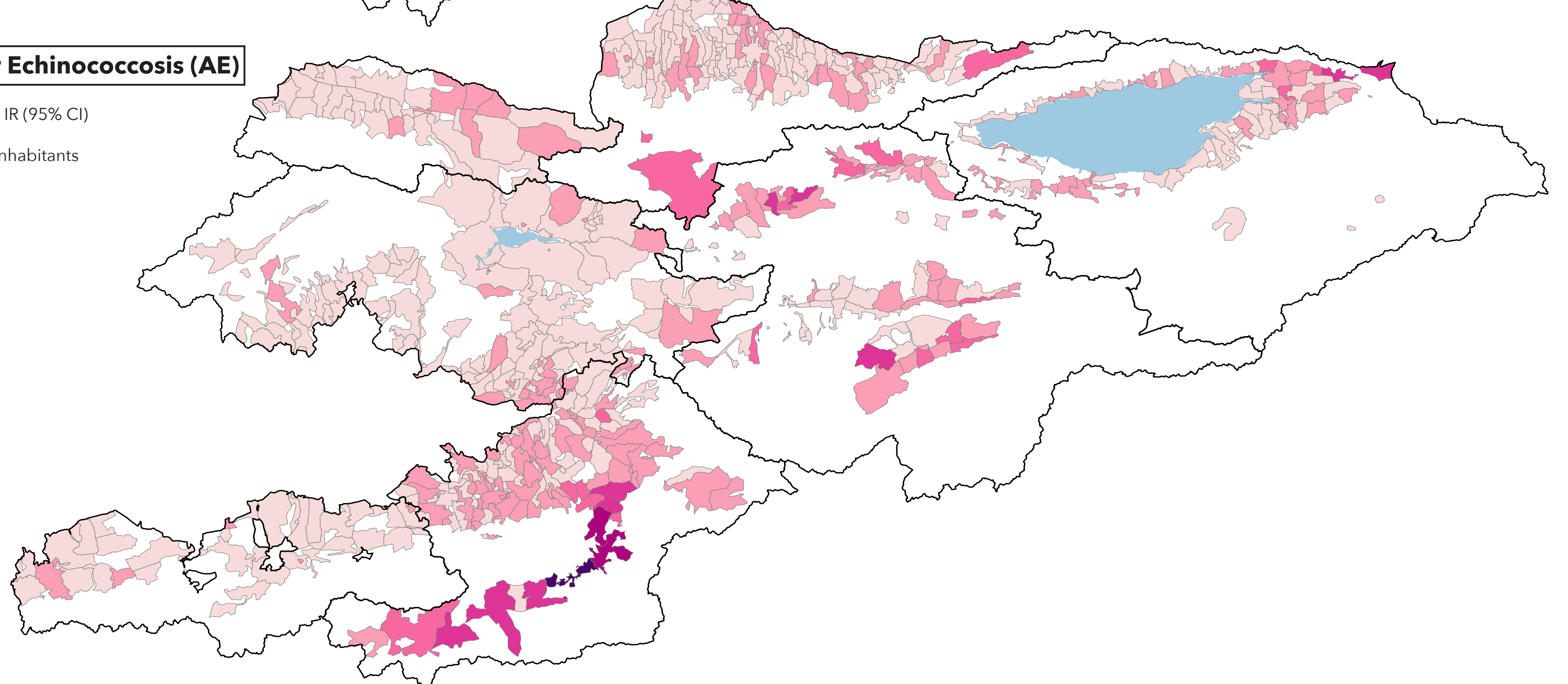
#### Cystic Echinococcosis (CE)

Overall crude IR (95% CI)  
13.1 (12.6-13.6)  
per 100,000 inhabitants



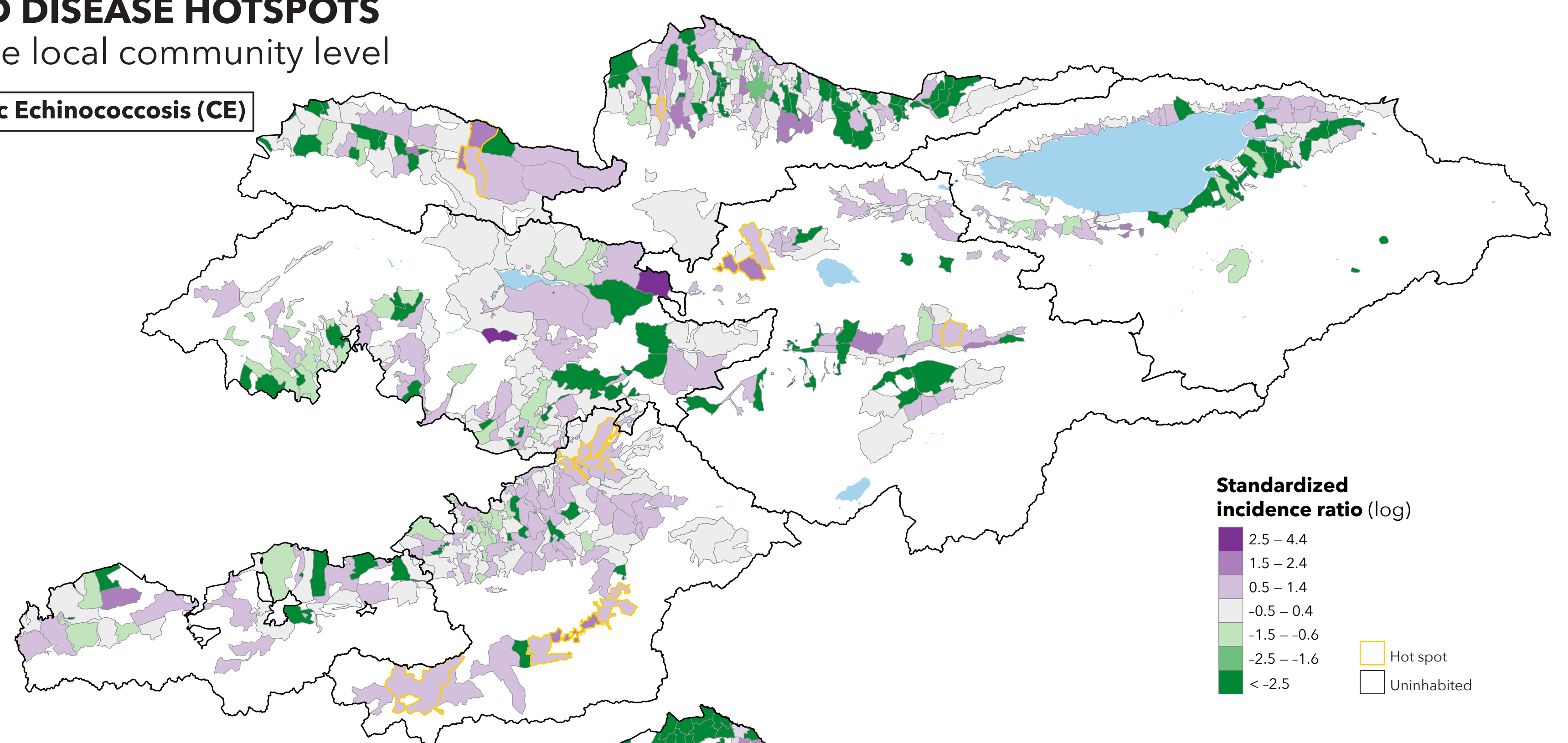
#### Alveolar Echinococcosis (AE)

Overall crude IR (95% CI)  
3.0 (2.8-3.3)  
per 100,000 inhabitants



### C STANDARDIZED INCIDENCE RATIO (SIR) AND DISEASE HOTSPOTS at the local community level

#### Cystic Echinococcosis (CE)



#### Alveolar Echinococcosis (AE)

