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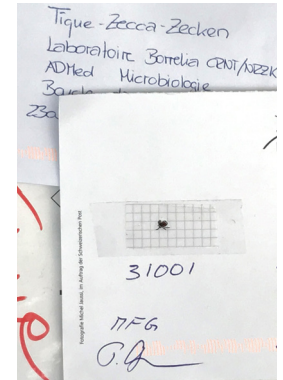
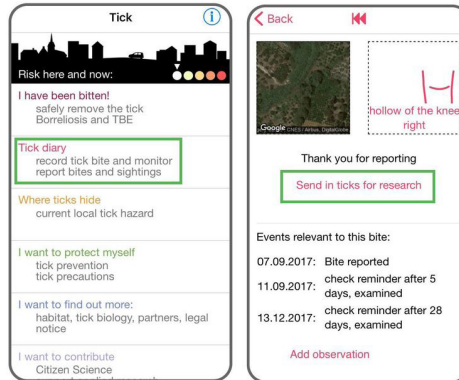
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# Pathogen prevalence in ticks parasitizing humans A citizens science application

## Collecting ticks with the smartphone App „Zecke – Tick Prevention“

- 80'000 iOS/20'000 Android downloads
- Tick diary helps to remember tick bites and informs about LD-symptoms
- Interactive risk map for real-time representation of local tick risk; combination of statistical hazard potential map with local live weather data
- Possibility to send ticks for research purposes (pathogen screening), participants will not receive any results from the analysis.



How to send a tick that have bitten people to the National Reference Centre for Tick-borne Diseases (NRZK)? Use the paper envelope to send in small ticks no larger than 2 mm in size. To send in engorged female ticks, please request a shipping box by email. 1. Tape the tick to a sheet of paper; 2. Label the tick with the following number generated by the smartphone app; 3. If you send several ticks to the same sheet of paper, label each tick with the corresponding number.

## Screening methods:

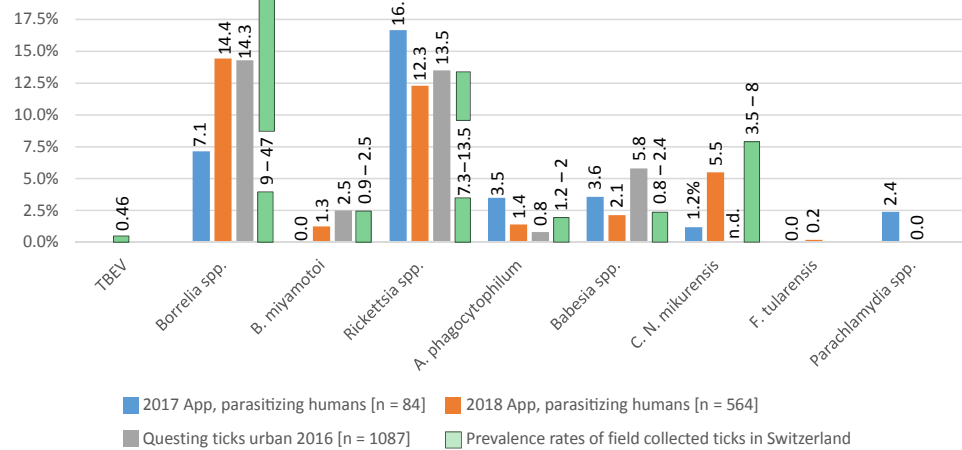
q(RT-)PCR

Typing for *Borrelia spp.*, *Rickettsia spp.*, *Babesia spp.* and *Parachlamydia spp.* will be done by sequencing.

## Results

Huge increase of received ticks 2018.  
Collecting ticks with the smartphone App works.  
Ticks with multiple pathogens detected.

## Pathogen prevalence in ticks parasitizing humans 2017 and 2018 compared to questing ticks in Switzerland

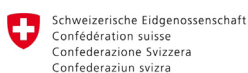


## Discussion: Crowdsourced samples

- Expansion of data acquisition capacity by the use of smart devices and media presence.
- Citizen science data must be incorporated into tick surveillance. Handling of „inaccurate“ App-reports?

## Conclusion

- Sampling ticks parasitizing humans by a smartphone-App is a non-standardized method. Prevalence rates have to be interpreted with care.
- Carriage of multiple pathogens demonstrates the potential risk of acquiring multiple infections as a consequence of a tick bite.
- Pathogen prevalence in ticks parasitizing humans is comparable to pathogen carrier rates found in questing ticks. The prevalence rate of *Borrelia spp.* is lower than the average of field collected ticks.



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In collaboration with ADMED Microbiologie & CHUV Lausanne

