



---

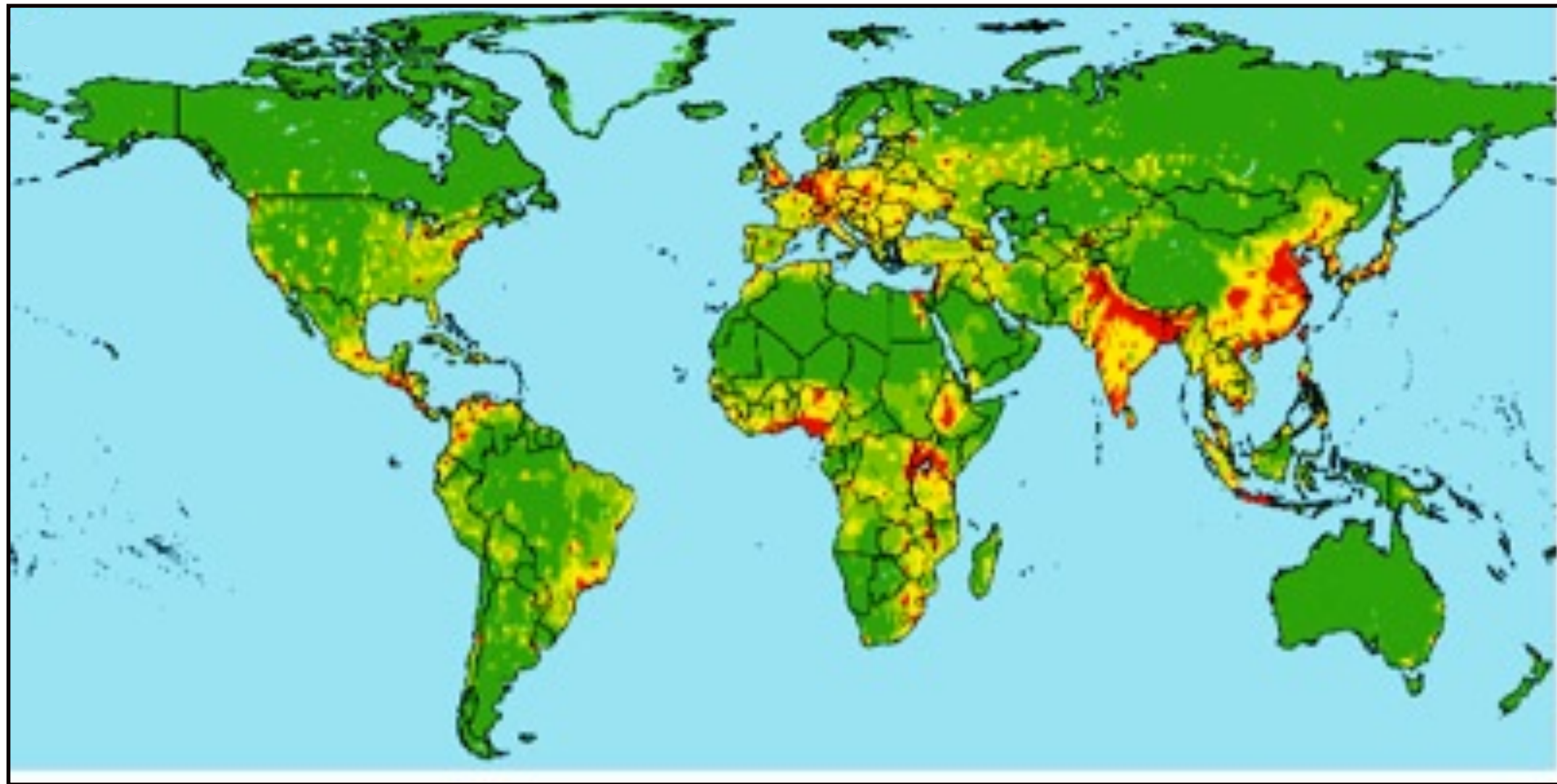
# **Determining hotspots of human exposure to rodents, bats and monkeys in Bangladesh**

**Ireen Sultana Shanta, DVM, MS**  
**Research Investigator, icddr,b**

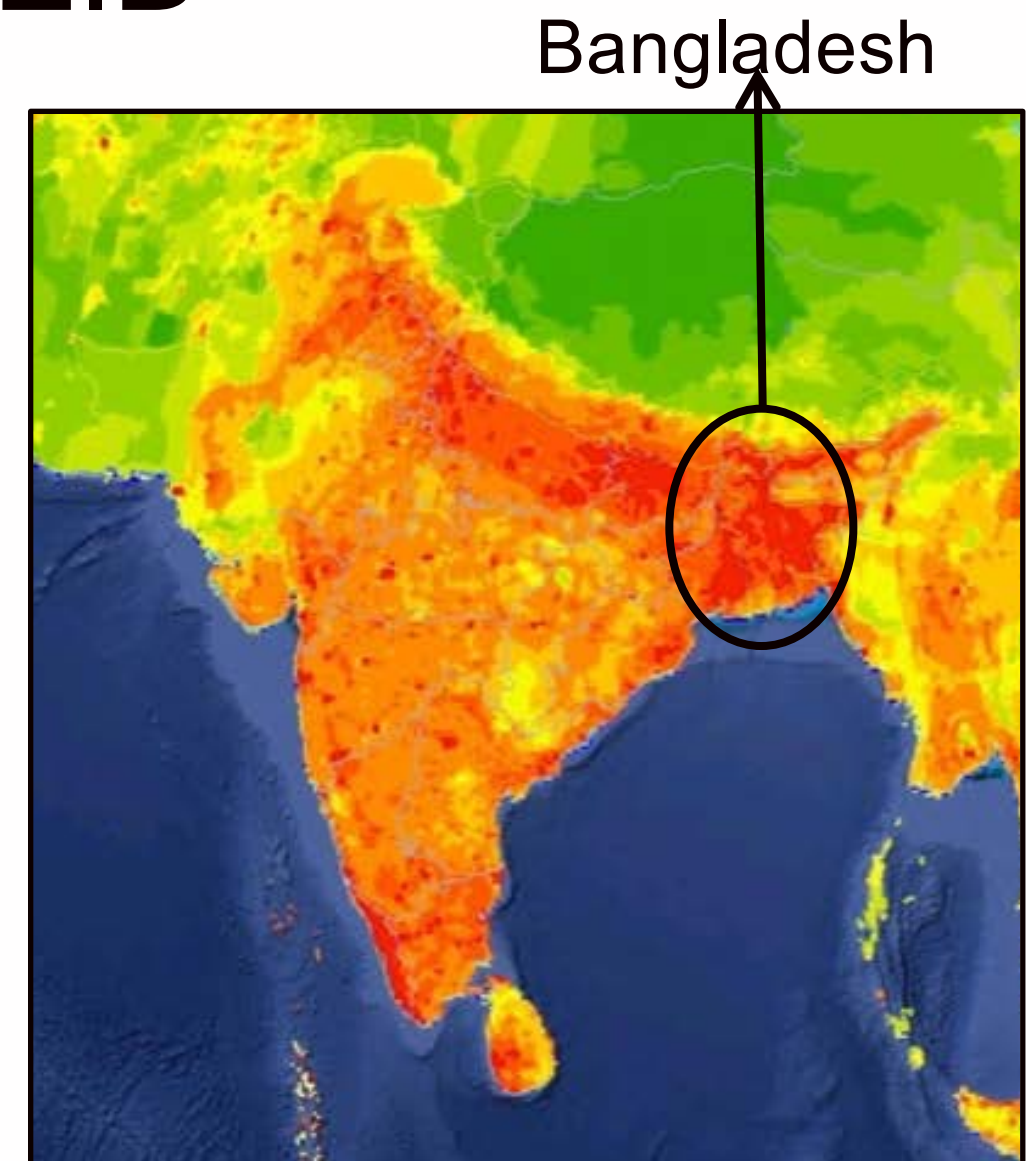
**International Meeting on Emerging Diseases and Surveillance**  
**4-7 November, 2016**

# Background

- Zoonoses are important contributors to emerging infectious diseases (EID) worldwide
- Most EIDs originated from wildlife
- Bangladesh is one of the hotspots for EID



(Jones et al., 2008, Nature)



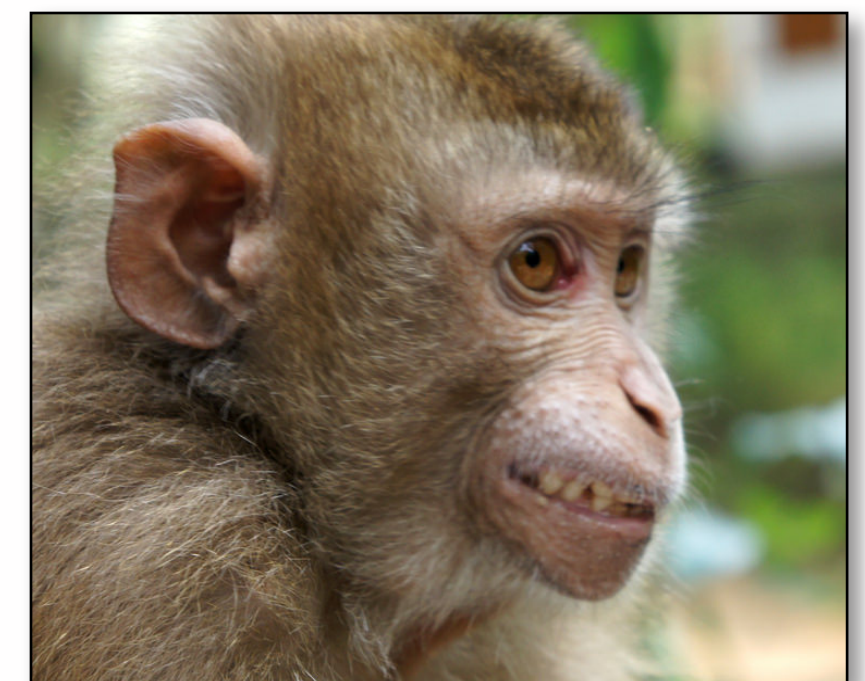
(Olival et al., 8<sup>th</sup> One health Bangladesh Conference, 2015)

- The wildlife most likely to be implicated in transmission of new EIDs are those that are closest to humans in terms of genetic makeup, such as **primates**, and those which are most abundant, including **bats** and **rodents**
- Viruses originating from all three of these animal groups have caused large outbreaks or pandemics in humans, including HIV, Ebola, Nipah, SARS and others
- To predict and prevent EIDs, we need to better understand the context of transmission
- The search for new EIDs should focus where contact between humans and these animal types are most intense

# Objectives

To identify human exposure to rodents, bats and monkeys in Bangladesh in terms of

- Frequency
- Spatial distribution and
- Seasonality



# Methods

- Cross sectional survey (2013-16)
- Community list was divided into 16 strata
- Enrolled 9,512 households from 952 randomly selected communities (proportionate to population size)
- From each community, 10 randomly selected households were enrolled

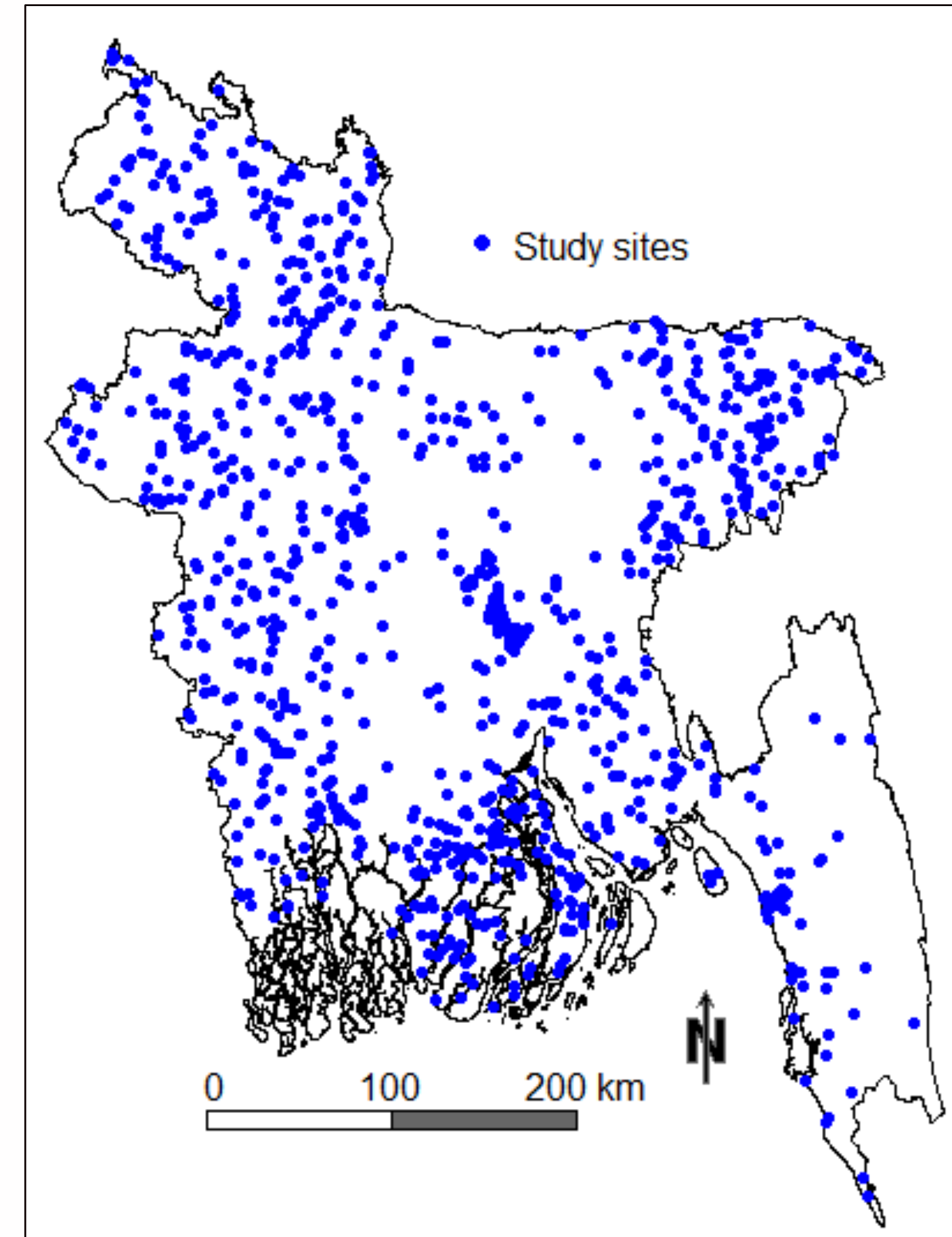


Fig: Study sites

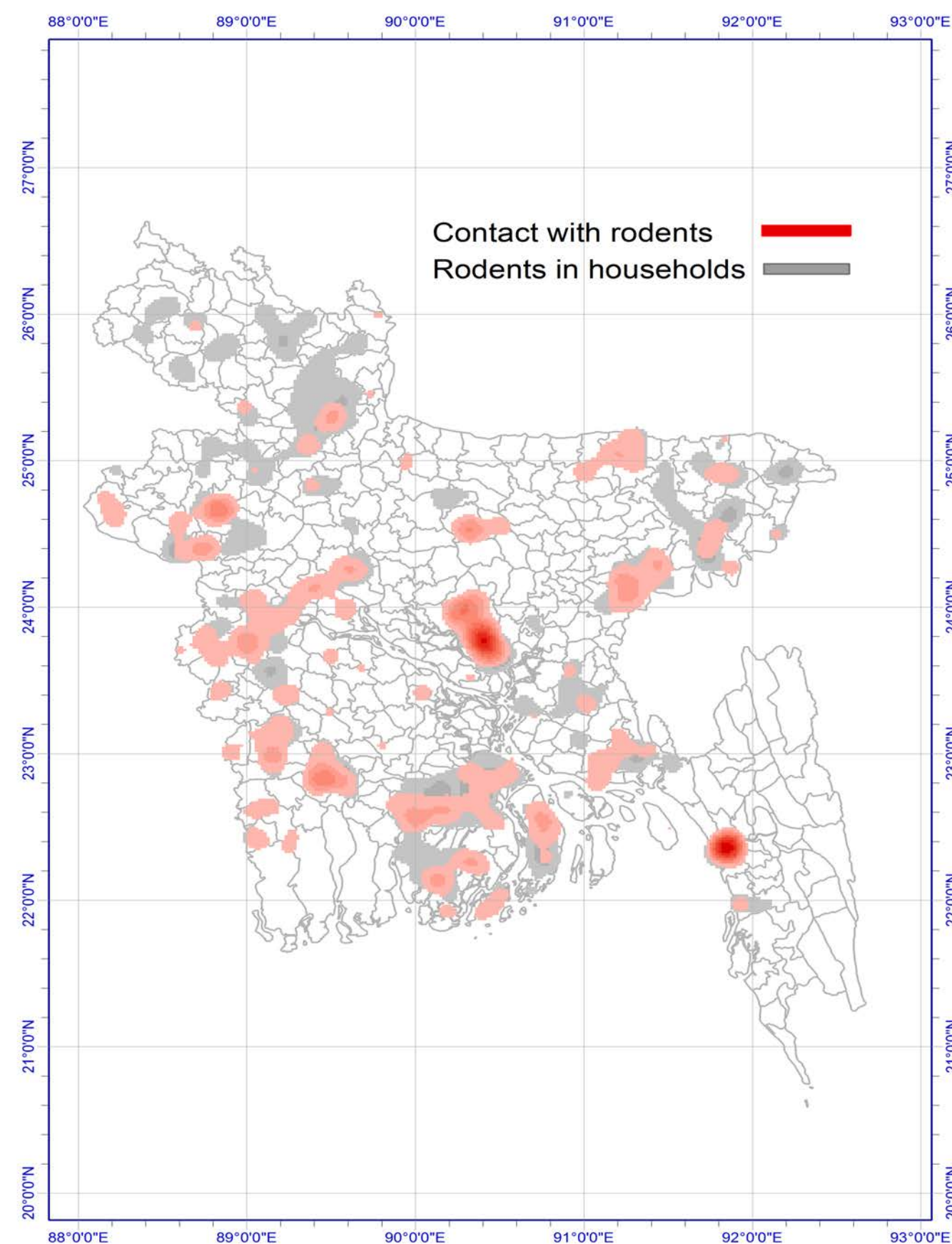
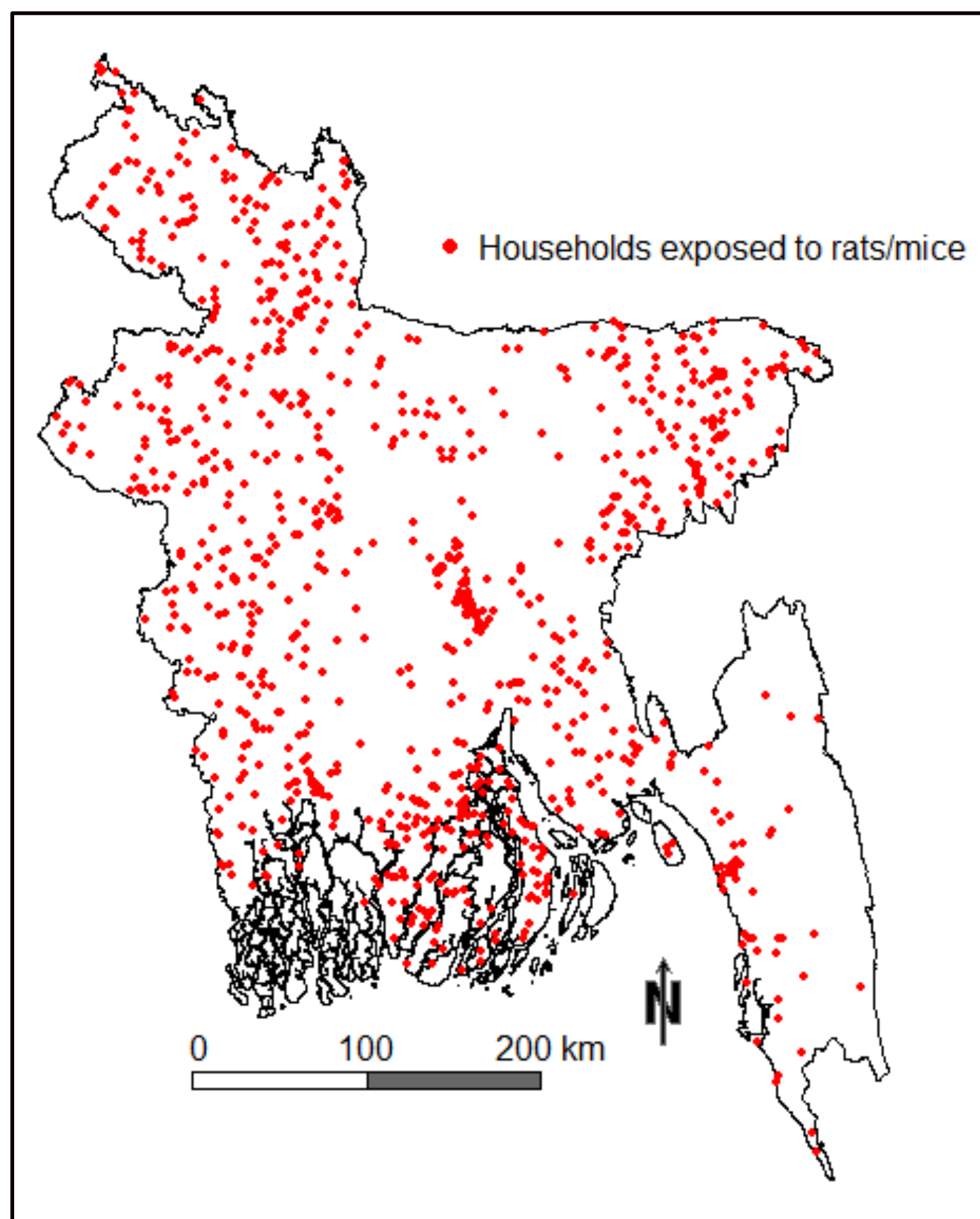
# Data Collection

- Interviewed adult household members aged between 18 to 60 years
- Asked about any household members' **exposures** to rodents, bats and monkeys within the past month
  - ✓ Direct contact : touching live or dead animals, hunting, consuming, attacked by, bitten by, playing with, slaughtering, butchering, skinning, scratched by
  - ✓ Reported observation:
    - observing rats/mice in their households
    - observing bats or monkeys close to their households

# Frequency of households reporting monthly human exposures to the animals

<b>Observed or contact with the animals N=9,512</b>	<b>Frequency (n)</b>	<b>Percentage (95% CI)</b>
<b>Rats/Mice</b>		
Observing rats/mice in their household	8,561	90 (89-91)
Direct contact with rat/mice	809	8.5 (7.9-9.1)
<b>Bats</b>		
Observing bats close to their Household	4,617	51 (50-52)
Direct contact with bats	48	0.5 (0.4-0.7)
<b>Monkeys</b>		
Observing monkeys close to their household	181	2 (1.6-2.2)
Direct contact with monkeys	5	0.05 (0.02-0.13)

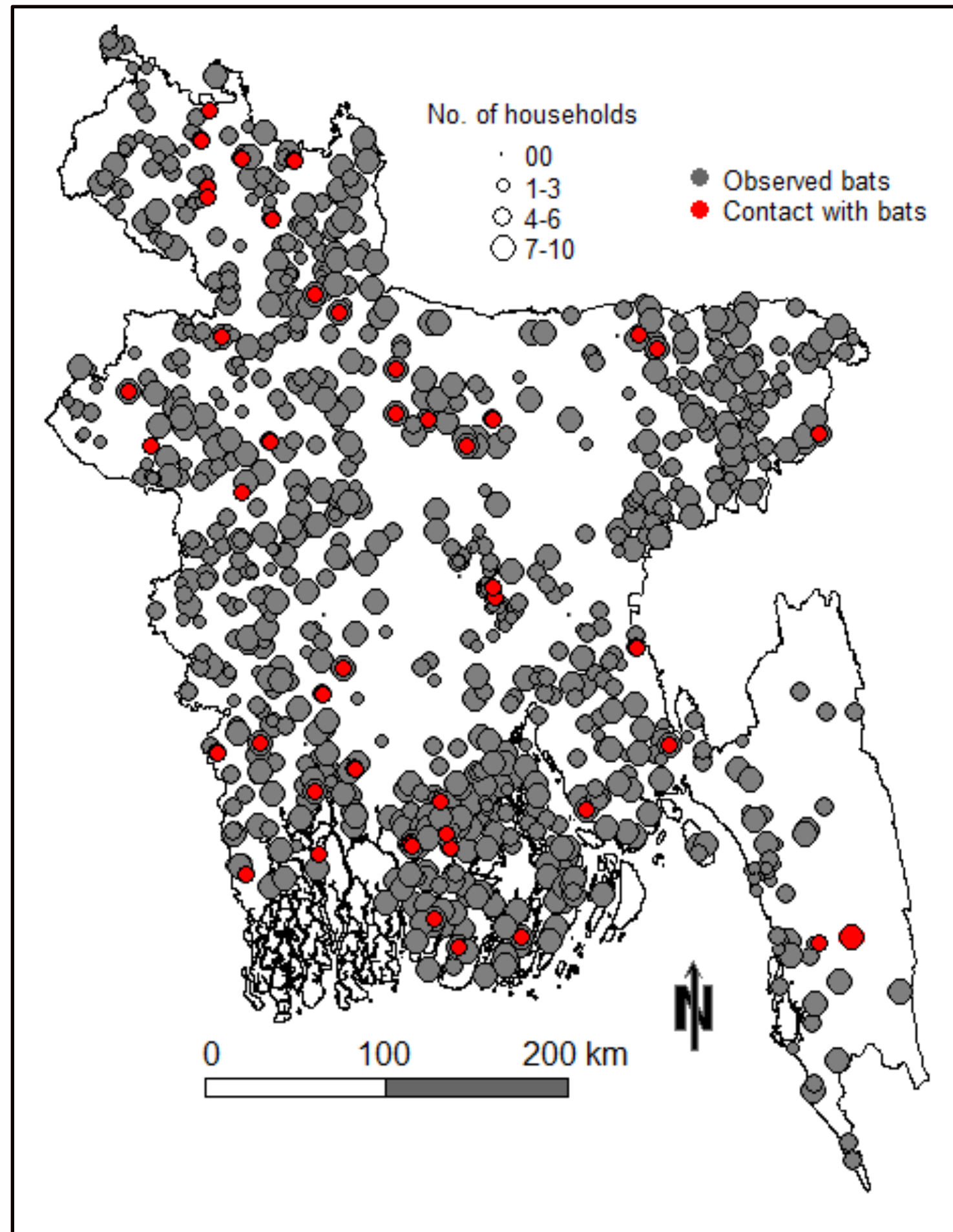
# Households reporting exposure to rats/mice



- Contact with rodents was more commonly reported in the two largest metropolitan areas and their surroundings

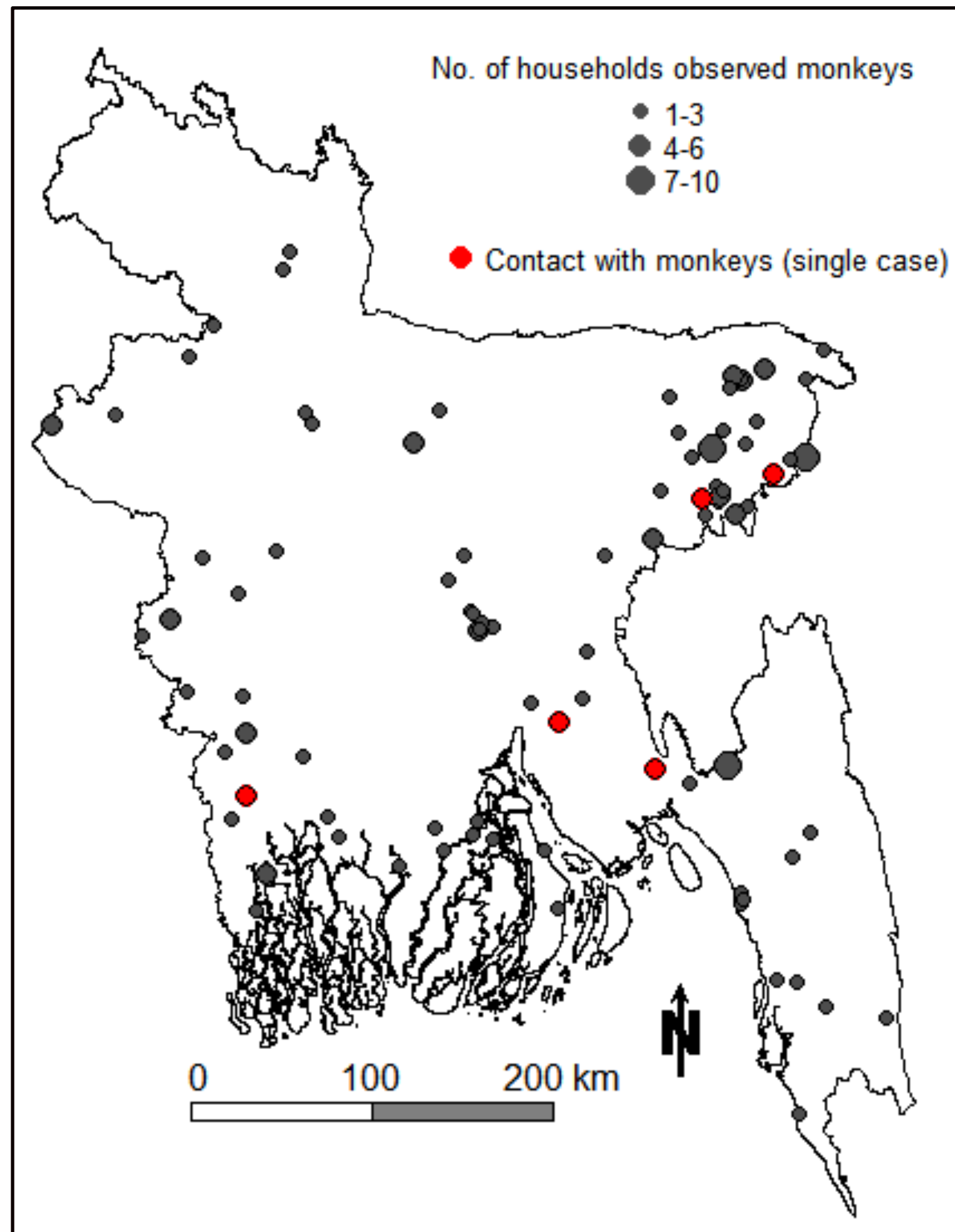


# Households reporting exposure to bats



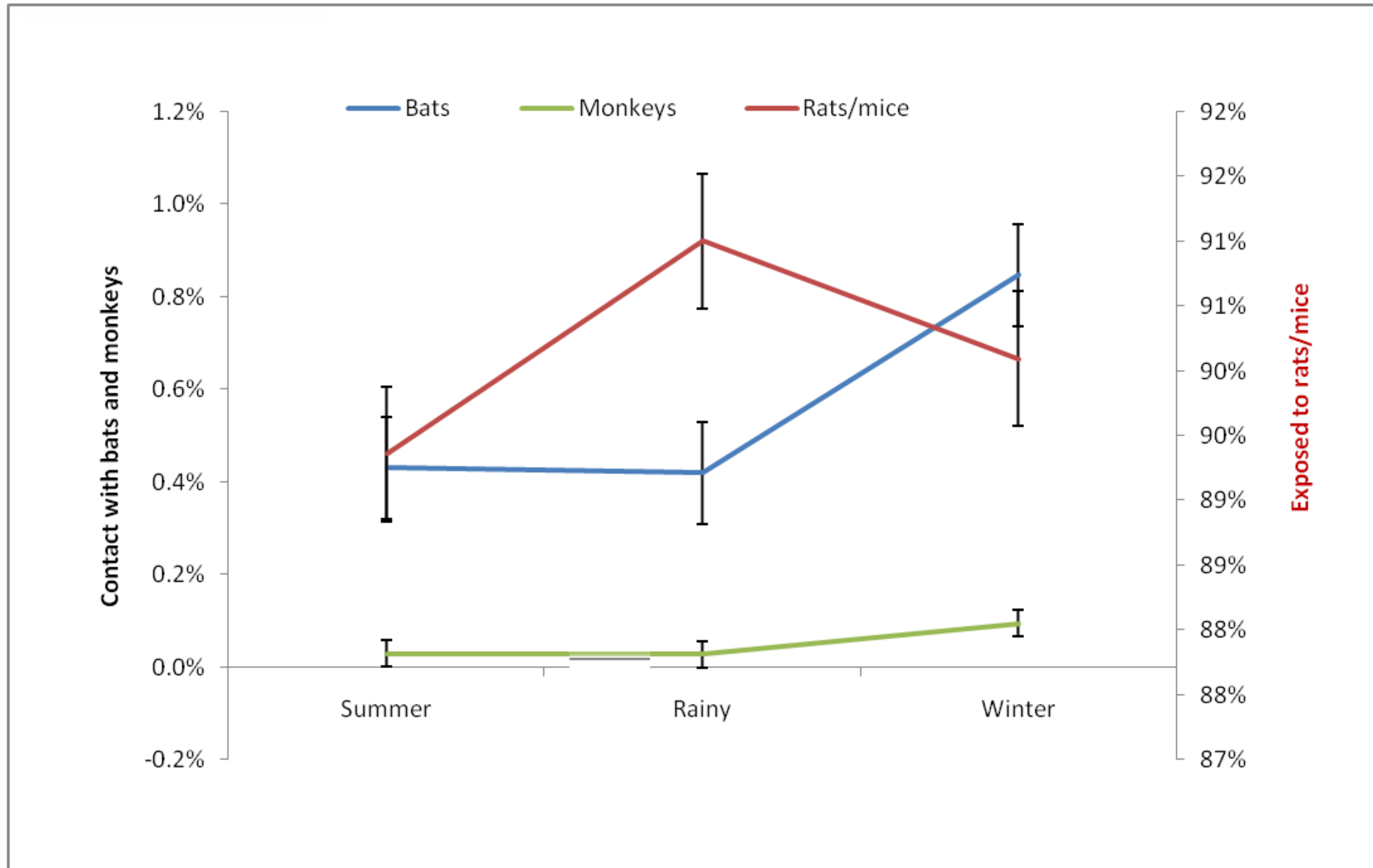
- Human exposure to bats was primarily reported in the northwest and southwest part of the country

# Households reporting exposure to monkeys



- Presence of monkey close to households was primarily reported in the northeast and southwest part of the country
- Only had five contacts

# Seasonality



# Conclusions & Recommendations

- Of the 160 million people in Bangladesh, 13.6 million might had direct contact to rodents every month, 800,000 to bats and 80,000 to monkeys
- Surveillance and prevention efforts should be targeted to population with higher exposure

# Acknowledgement

This project has been funded by CDC (5U01GH001207)

Research participants

Field research assistants



**All co-authors:** Stephen P Luby, Kamal Hossain, Syed Sayeem Uddin Ahmed, Taifur Rahman, Erin Kennedy, Yushuf Sharker, A. Marm Kilpatrick, J. R.C. Pulliam, Emily S Gurley

icddr,b thanks its core donors for their on-going support



Government of the People's  
Republic of Bangladesh

Canada

