



# **The impact of human development on rates of reported animal bites , Lake County, FL 2013-2017.**

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# Objectives



- **Background/Rational**
- **Goals/Objectives**
- **Study Design/Methodology**
- **Expected Outcomes**
- **Where are we now?**
- **References**
- **Questions**

# Background and Rational

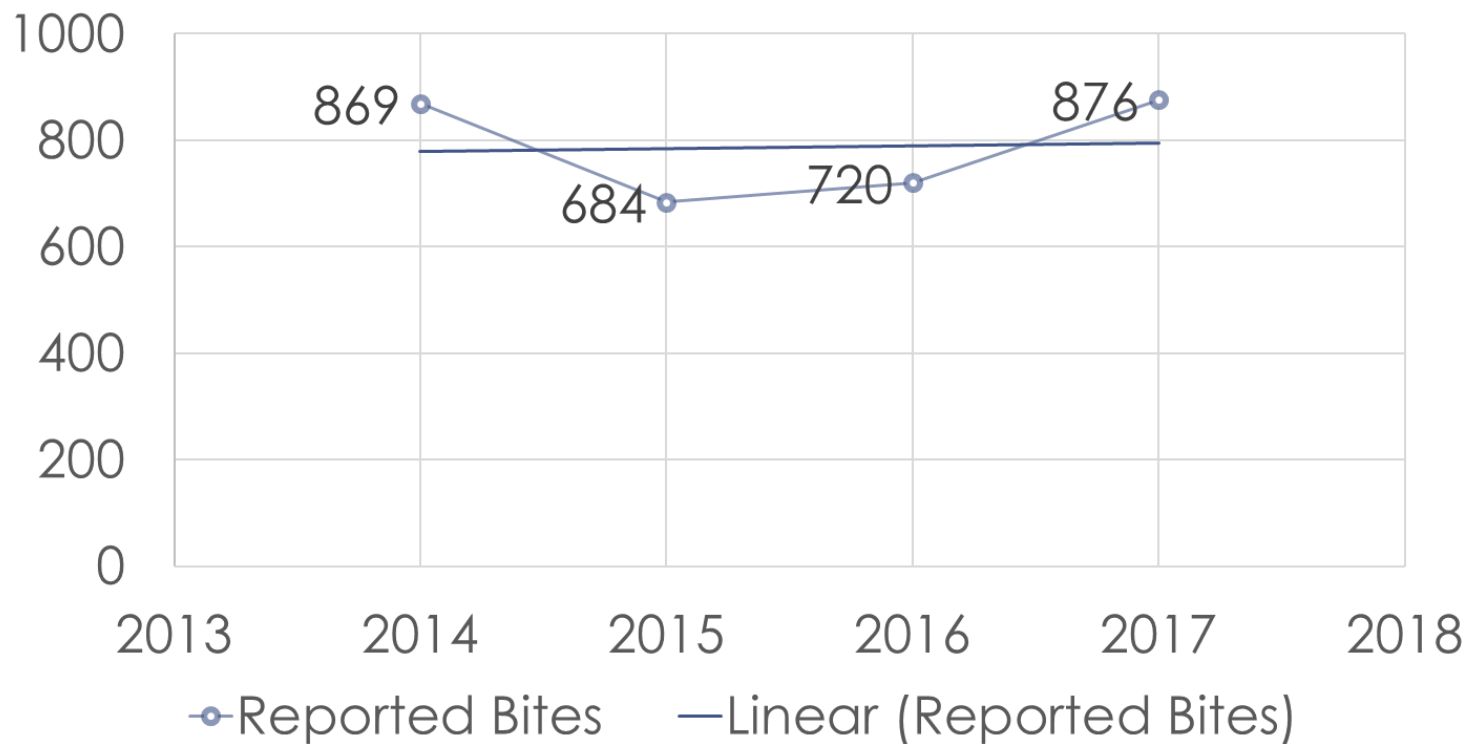


- **Animal bites are a public health concern**
  - They are a considered a notifiable disease condition in most states
  - They increase risk of transmission of zoonotic illnesses
  - Children ages 0-4 are disproportionately affected
- **Animal bites continue to increase in the US**
  - Dogs account for 80% of reported bites
  - Since 2001, risk of being bitten by a dog has increased 50%
  - Dog ownership has increased by 42% since 2001

# Background and Rational



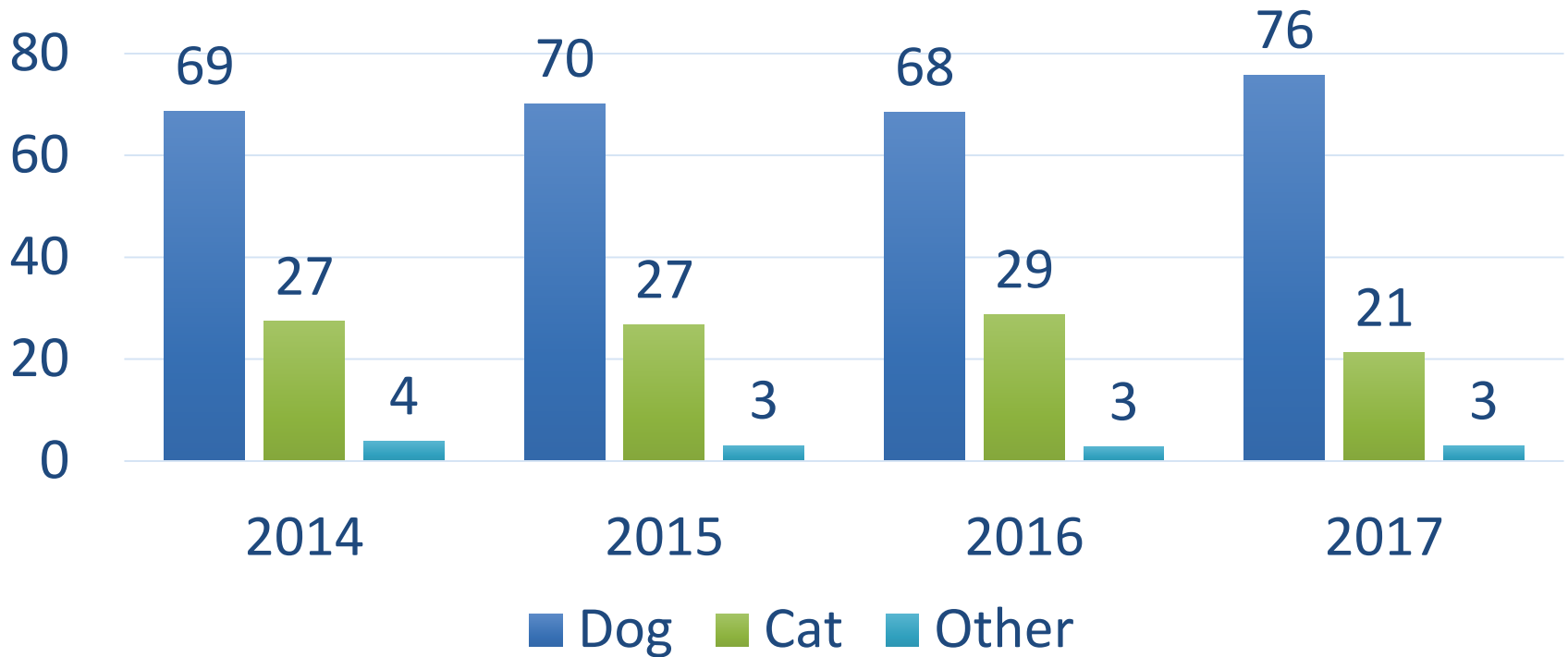
TOTAL BITES REPORTED BY YEAR  
LAKE COUNTY, FLORIDA, 2014-2017



# Background and Rational



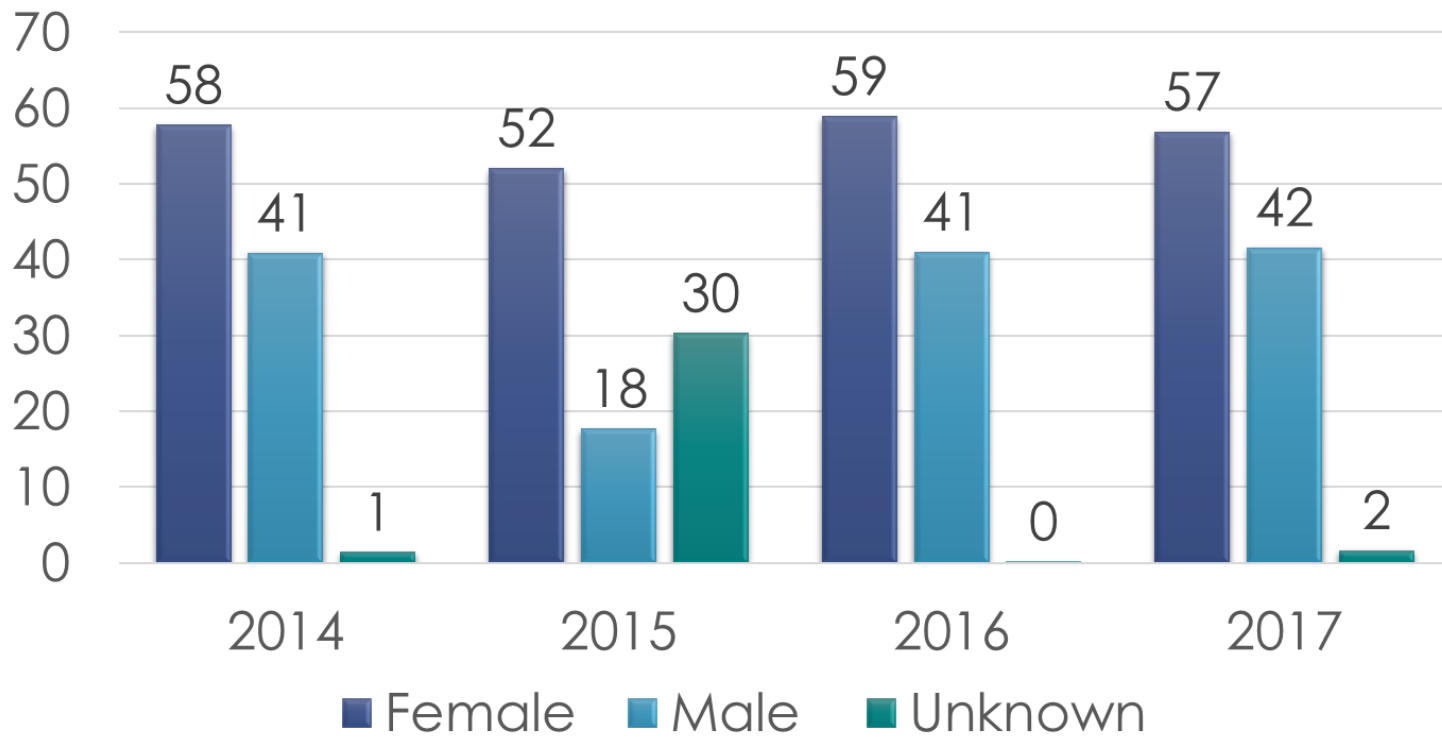
## ANIMAL TYPE PERCENT BY YEAR LAKE COUNTY, FLORIDA, 2014-2017



# Background and Rational



PERCENT OF GENDER BY YEAR  
LAKE COUNTY, FLORIDA, 2014-2017





# Background and Rational



| Age Group    | Number of Bites | Total Population | Population Percent per Age Group | Proportion Bite Victims | Age-Specific Bite Rates per 1,000 Population |
|--------------|-----------------|------------------|----------------------------------|-------------------------|--|
| <1-4         | 124             | 48486            | 4.8                              | 0.00256                 | 2.56   |
| 5-17         | 386             | 159596           | 15.8                             | 0.00242                 | 2.42   |
| 18-24        | 186             | 99870            | 9.9                              | 0.00186                 | 1.86   |
| 25-49        | 643             | 261362           | 26.0                             | 0.00246                 | 2.46   |
| 50-64        | 419             | 189540           | 18.8                             | 0.00221                 | 2.21   |
| 65+          | 392             | 248315           | 24.7                             | 0.00158                 | 1.58   |
| <b>Total</b> | 2150            | 1007169          | 100.0                            | 0.00213                 | 2.13   |

TABLE 1. Age-Specific Bite Rates for All Bite Reports: Lake County, FL (2014-2016)

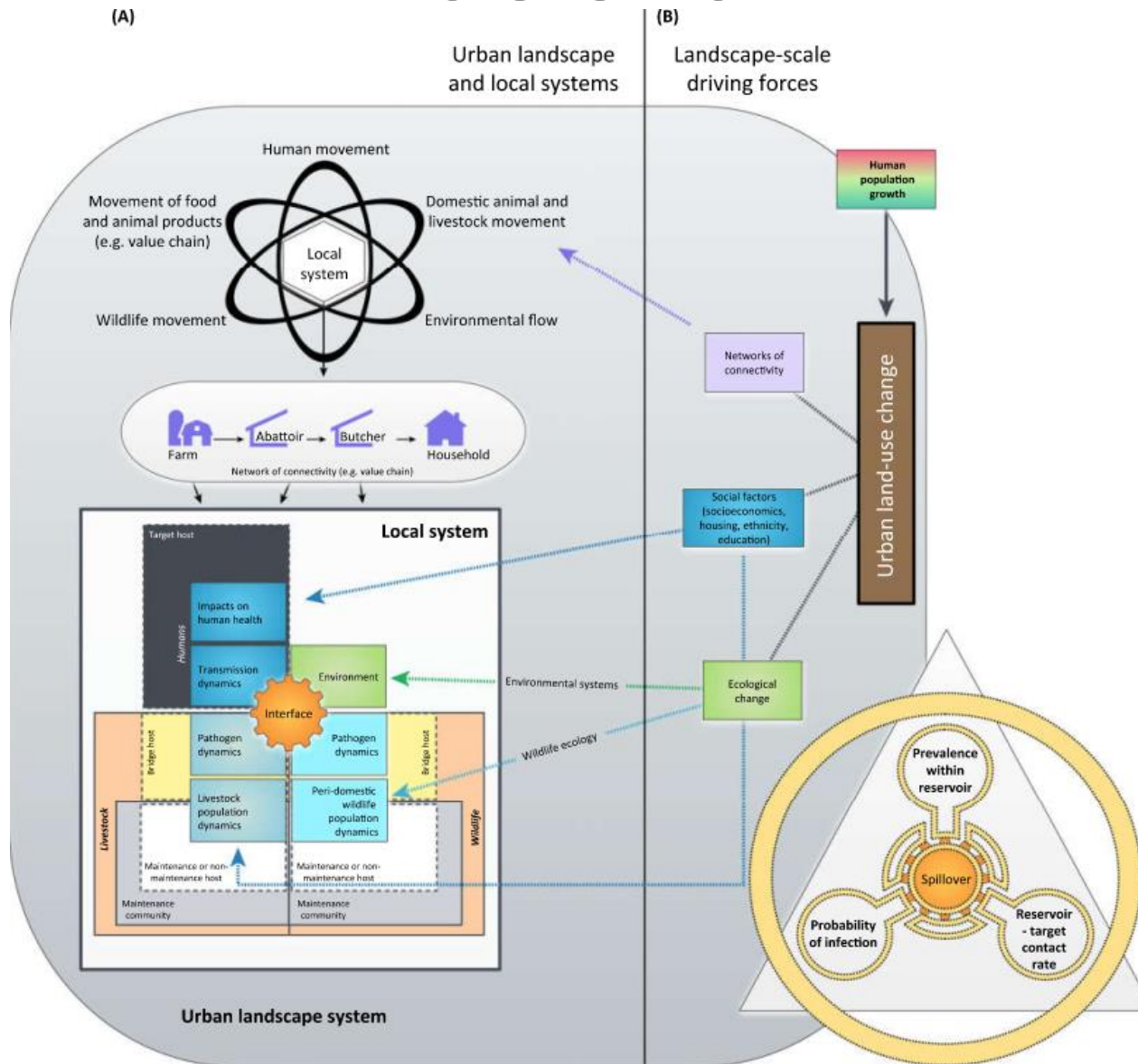
# **Background and Rational**



- **Domestic animals play an important role in maintaining the wildlife-livestock-human interface.**
  - **As human encroachment increases into previously undeveloped areas, these interactions also increase**



# Background and Rational



Source: Adapted by Hassell et al, 2017, Figure 1. Conceptual Framework for Disease Emergence in Urban Landscapes.

# **Background and Rational**



- **The effects of the wildlife-livestock-human interactions have been well documented in developing countries.**
  - **Negative impacts on agricultural practices**
  - **Negative impact on wildlife diversity**
  - **Maintenance of zoonotic disease cycle in competent hosts**
- **Less known are these effects in developed areas**

# **Background and Rational**

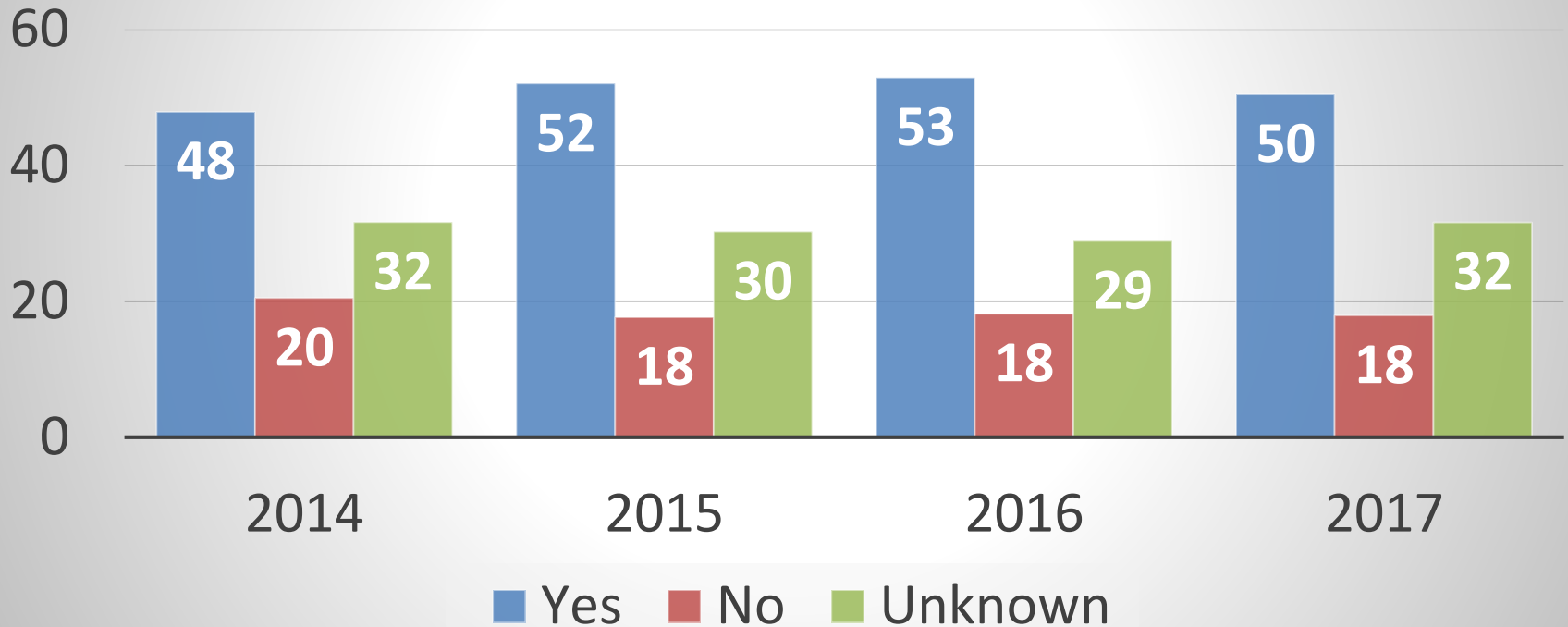


- **Lake County, FL poses a unique community for study**
  - **Rapid urban development**
  - **Large Agriculture communities**
  - **Rural/forest communities**

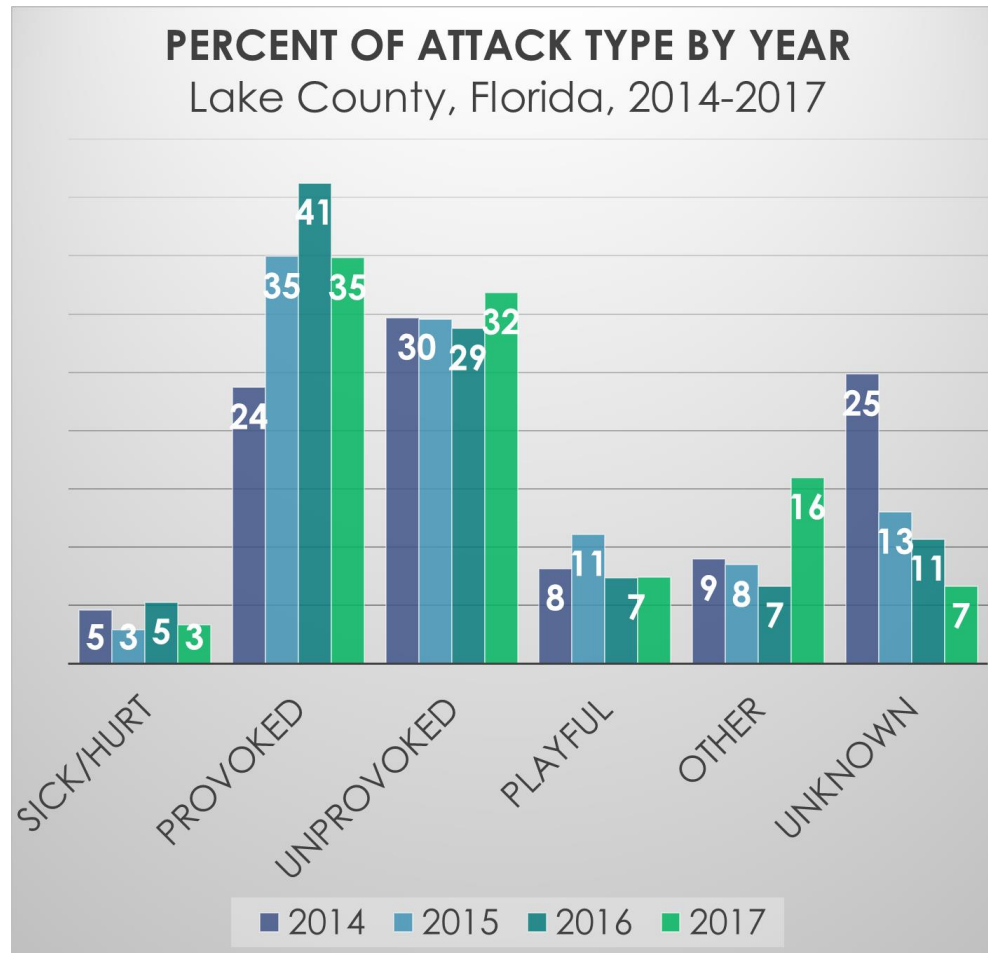
# Background and Rational



PERCENT OF VACCINATED ANIMALS,  
LAKE COUNTY, FLORIDA, 2014-2017



# Background and Rational



# **Background and Rational**



- **Do the effects documented in rapidly developing countries also apply to smaller unique communities in developed countries?**
- **Do the effects of rapid urban development increase the rate of animal bites/rabies exposures?**



# Goals and Objectives



- **Primary Goal: Identify if a causal relationship exists between urban development and reported animal bites**
- **Secondary Goals:**
  - Identify populations at increased risk for bites or injury
  - Develop predictive models
  - Improve knowledge and understanding
  - Development of policies and programs
  - Influence funding for education and prevention

# **Study Design and Methodology**



- **Retrospective case review of patient self-reported data**
- **Inclusion Criteria**
  - **Lake County Resident**
  - **Zip code data must be available**
  - **Rabies possible exposure**
- **Population estimates will be from US. Census Bureau Annual Estimates of Resident Populations from April 1, 2010 to July 1, 2017**

# **Study Design and Methodology**



- **Urbanization rates will be defined as the percentage of population increase from the previous year**
- **To control for differences in population rates per 10,000 will be used**
- **ArcGIS to develop Choropleth maps intersection**
- **Chi square testing will be done to determine if data is normally distributed**
- **Descriptive statistics**

# Expected Outcomes



- **Alternative Hypothesis**
  - There is a significant increase in the number of reported bites in zip codes with higher percentage of estimated population growth as compared to zip codes with lower percentages of estimated population growth
- **Null Hypothesis**
  - There is no difference in the rate of reported bite for zip codes with higher or lower estimated percentage population growth
- **Expected Outcome**
  - We will accept the alternative hypothesis

# Where are we now?



- **Currently in the process of going through IRB approval**
- **Data analysis will begin May 1<sup>st</sup>**
- **Analysis should conclude July 1<sup>st</sup>**
- **Write up should be complete by December 1<sup>st</sup>**



**Questions?**



# References



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