

# Warmup: odds and log-odds

**Group members:**

**Instructions:** Work with a neighbor on the following activity. I will collect the handout at the end of class, and it will be part of your class participation grade. You will be graded only on effort – it is ok if you don't finish all the questions, or get them all correct.

## Odds

Last time, you calculated that the empirical probability that a 5 year old patient has dengue is 0.2.

Recall that if  $\pi$  is the *probability* of an event, then the *odds* are given by

$$\text{odds} = \frac{\pi}{1 - \pi}$$

1. If  $\pi = 0.2$ , calculate the odds.
2. Repeat the calculation for  $\pi = 0.1$  and  $\pi = 0.9$ . What happens to the odds as  $\pi \rightarrow 0$ ? As  $\pi \rightarrow 1$ ?

## Log-odds

As we shall see, we often work with the *log-odds* when modeling binary data. If  $\pi$  is the probability of an event, then the log-odds are

$$\text{log-odds} = \log(\text{odds}) = \log\left(\frac{\pi}{1-\pi}\right)$$

3. If  $\pi = 0.2$ , calculate the log-odds.

4. What happens to the log-odds as  $\pi \rightarrow 0$ ? As  $\pi \rightarrow 1$ ?