

The West Nile Weekly

SUMMARY: Six to fourteen counties are expected to report human cases in the week of August 1st - 7th. Brown County is more likely to report a case than not. Our model continues to suggest that this will likely be an above-average year for human WNV in SD.

We are now receiving large amounts of mosquito data from counties around the state. This allows us to take a closer look at the threat of WNV in SD, and here we discuss the message we are receiving from all sources: 2016 will probably be an above-average year for human WNV in SD, and may be in the top few years since the 2003 epidemic.

How's the weather?

After a cool period with precipitation across the state, a [heat wave](#) brings more record-breaking highs. This in itself is a concern for public health and agriculture, but will also increase WNV risk. Longer-term temperature and weather [predictions](#) are less clear; after this heat passes, it appears that temperatures may return to normal in the region.

How are the mosquitoes?

Aedes vexans collections are beginning to decline, as they normally do at this point in the year. *Culex tarsalis* collections have temporarily fallen but are expected to climb again as temperatures rise. We again emphasize the importance of continuing to spray for mosquitoes even if the nuisance mosquito is vanishing, because the vector species is still present.

The virus, most importantly, is steadily multiplying. With 1045 vector pools tested, 2.6% (28) pools have been positive; this was 1.7% last week. Figure 1 shows the proportion of pools that have been positive on a weekly basis (red), along with the estimates of a model that we use to understand this data (blue).

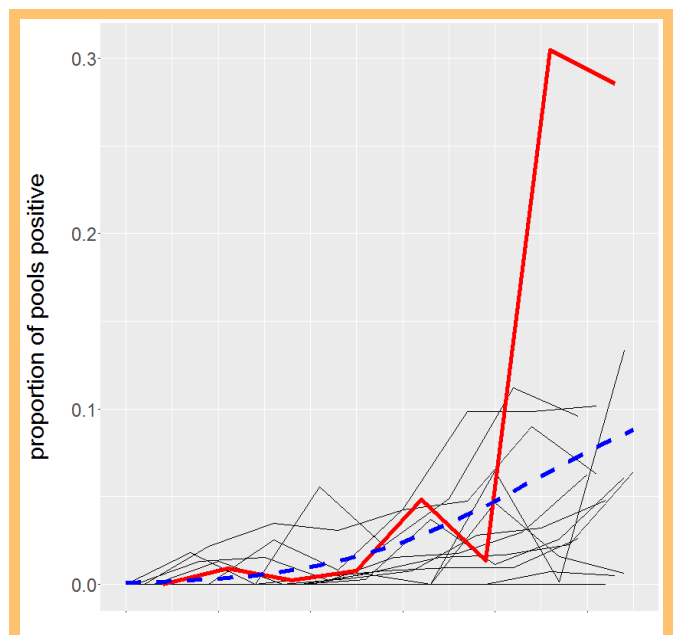


Figure 1: Observed (red) and estimated (blue) positive pool rate for 2016 and other years (black), based on all data available July 24th.

Our primary concern is that the rate of positive pools has exploded unexpectedly in the last two weeks; unexpected deviations from historical trends are troubling. It is likely that some negative pools have not been reported and that those last two high weeks will be revised as we receive more data, but we are not hopeful that 2016 will be pushed below average.

Even if we exclude very recent pools, 2016 has the fourth highest estimated vector infection rate for this week when compared to all other years.

Other indices such as the minimum infection rate (MIR) tell the same story. Considering all vectors collected since the beginning of 2016, at least 1.4 per 1000 vector mosquitoes have been infected statewide; this was 1.0 last week. This is 12 positives for Brown County, 8 for Brookings, 3 for Minnehaha, 2 each for Hughes and Davison, and 1 for Edmunds. Measured this way, 2016 currently has the fourth highest cumulative MIR for this week, among all years since 2005.

What to expect?

Estimated statewide risk has risen to 14.0% of all counties in the week of August 1st - 7th, so that six to fourteen counties are expected to report cases this week. Brown has an estimated 61.9% probability, or nearly 2 in 3 chance, of reporting a case (Figure 2).

The pattern of per-person risk has shifted slightly, with the majority of risk still concentrated in the Prairie Pothole Region (Figure 3). The highest estimated per-person risk is in McPherson, Edmunds, Spink, Day, and Marshall, each of which is estimated to have 5 new cases per 100,000 citizens in this week.

Historically, 12% of cases occur in the week of August 1st - 7th. Of all cases, 33% tend to occur before August 7th; i.e. by the end of this week, we will probably be 1/3 of the way through 2016's human cases.

We have revised our year-long estimates of statewide risk. Our estimates for the current year continue to place it below 2012, in which there were more than 200 cases in SD. Our model indicates that there will be more than 103 cases eventually reported in SD, with 152 cases most likely.

What's going on elsewhere?

[NE](#) and [Los Angeles county](#) have reported their first human cases. Even though [MI](#) has only now confirmed its first case, experts in the region are already talking in terms of an outbreak. CA continues to advise that it is receiving nearly twice as many positive samples as expected ([video](#), [data](#)).

In an odd set of samples from a single county on a single day in [MS](#), 11 pools out of 13 tested were positive. We have seen similar but smaller clusters of positive pools; e.g. four pools from a single farm in Brookings County, all collected on a single day, all

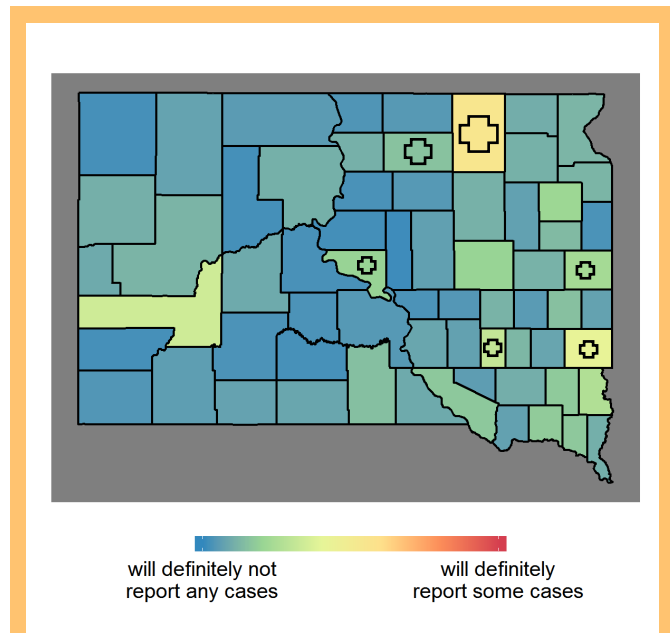


Figure 2: Estimated per-county risk for the week of August 1st. The + indicates that positive mosquito pools have been reported.

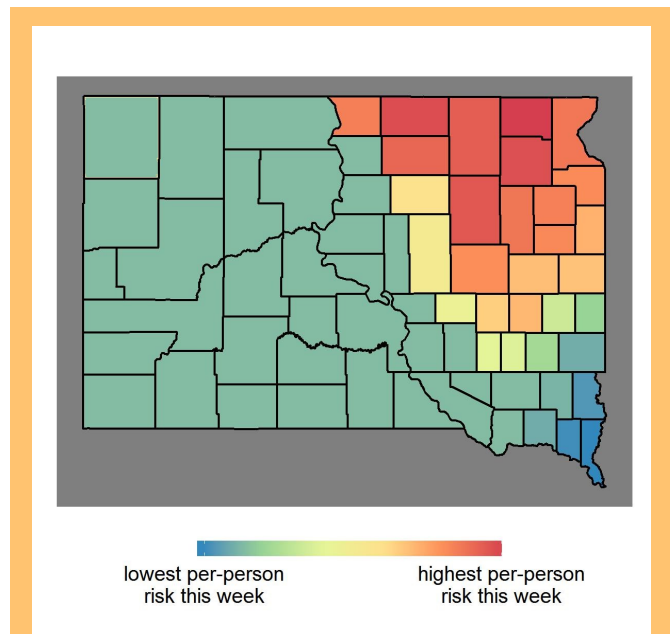


Figure 3: Estimated per-person risk for the week of August 1st, mostly concentrated in the Prairie Pothole Region.

tested positive. Positives are normally rare and spread out through space and time.

This indicates that some locations are at least temporarily much more dangerous than average, and that repeated, local mosquito collection and testing are essential if we are to successfully characterize risk.