

Preliminary report on the effects of aerial spraying in Dallas Co., Texas

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Background

The first human WNV cases in Dallas Co were noted in May, 2012. In response to these cases, the local vector mosquito control authority, a Division of the Dallas County Department of Health and Human Services, increased surveillance and control efforts. Specific activities included increased ground application of products targeting adult mosquitoes and optimization on their application methods through increased dosage and flow rates. As a consequence of the increasing number of cases and wider geographic distribution of the outbreak, aerial applications of insecticides were deemed necessary to cover the affected area quickly. Applications of the mosquito adulticide, Duet, were conducted August 16-23. Three zones of the county were selected for treatment, with spraying to occur over two consecutive nights. Zones 1 and 2 covered primarily the north portion of the county. In Zones 1 and 2, treatment was interrupted due to weather and rather than two consecutive nights, the zones were treated over a period of 5 nights. Zone 3 covered the east and portions of the south part of the county, which were treated on the nights of August 22 and 23. On the day before the start of spraying, the mosquito control contractor deployed carbon dioxide baited light traps in each zone targeted for spray the following night. These traps collect host seeking mosquitoes of several species, many of which are pests but not necessarily WNV vectors. The night after completion of spraying, light traps were again placed in each zone to monitor the effect of the insecticide application. In addition to the light trapping done in conjunction with the spraying, mosquitoes collected using gravid traps, which monitor specifically WNV vector mosquitoes, continued throughout the county using procedures established before the outbreak.

Results

The results of the pre- and post-treatment light trap sampling in all zones showed a decrease in *Culex quinquefasciatus*, the southern house mosquito, which is the important WNV vector. Data from the 259 gravid traps run by the County program in the zones treated with aerial application were evaluated for the period extending from 2 weeks before spraying through August 24. In addition, traps that were placed in parts of Dallas Co that were not aeri ally sprayed were examined during the same time period. Abundance of the WNV vector, *Culex quinquefasciatus*, decreased in traps in the treatment zones after the spray while their abundance increased in areas not aeri ally sprayed. *Culex quinquefasciatus* mosquito density decreased 93% from pre-treatment levels in Zone 3 where two consecutive treatments were achieved. Our preliminary evaluation indicates that reductions in *Culex quinquefasciatus* abundance were also observed in Zones 1 and 2, though the treatment in this area was interrupted by storms, resulting in a patchwork of treatment areas that complicates analysis. Further analysis is pending.

Conclusions

Preliminary data indicate substantial reductions in *Culex quinquefasciatus* mosquito populations in areas utilizing aerial applications of insecticides. Similar reductions observed in other areas of the United States have been accompanied by a reduction in human risk of acquiring WNV.

Recommendations

Though preliminary analysis shows vector populations were significantly reduced by aerial treatment, monitoring mosquito populations using gravid traps should continue over the remainder of the transmission season. This will provide new information needed to guide decisions about mosquito control operations, including aerial spraying.