

**Florida Department of Health
Bureau of Laboratories, Tampa**

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**Arbovirus Surveillance:
Annual Summary Report
2007**

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Annual Arbovirus Surveillance Summary Report: 2007

Surveillance efforts include the statewide Sentinel Chicken program as well as assay of dead bird and mammal tissue and mosquitoes (virus detection and isolation) and wild bird serology. Partial funding was through a supplemental ELC grant from the CDC. Our longstanding laboratory experience with arboviruses and this multi-agency collaborative surveillance program continues to place Florida among the top states in the nation for Arbovirus control.

West Nile virus (WNV) is a flavivirus, closely related to SLE but, unlike SLE, birds infected with WNV often die. Virus may be detected in the tissues of those birds. The first infected bird in Florida was detected on July 3, 2001, in a crow submitted from Jefferson County. At this time the virus is present throughout Florida, although level of activity varies throughout the state.

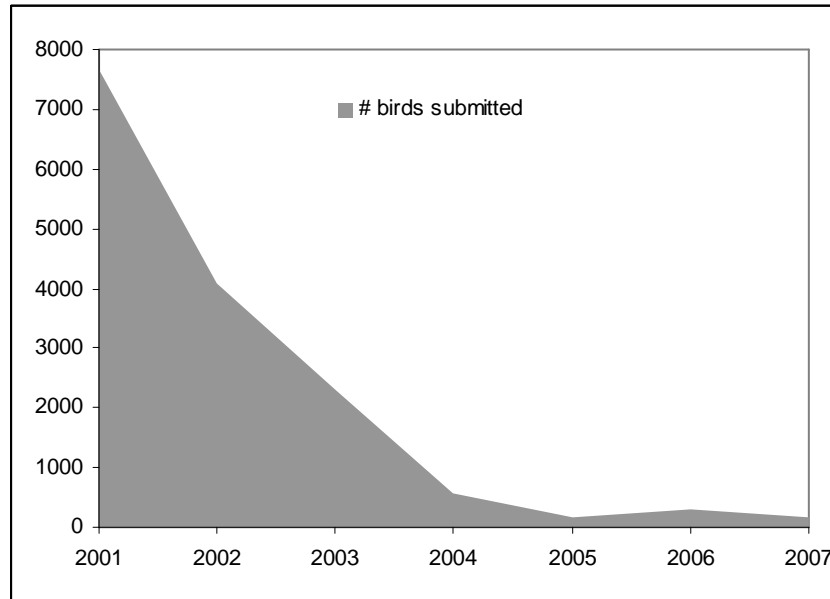
Effective arbovirus surveillance entails a concerted, coordinated effort over an extended time period. Sampling must be routinely and regularly performed in order for baseline activity to be recognized. Thus, increases above the historical levels of activity indicate increased risk of spread to the human population, risk that may be reduced by appropriate interventions. Mosquito activity and arbovirus transmission was extraordinarily low during 2007 due to the impact of the protracted spring drought.

Numbers of avian submissions for arbovirus detection have fallen dramatically since 2001 (Figure 1 and Table 1). All of the submitted animals were screened for WNV by molecular assays (TaqMan RT-PCR). They were also inoculated onto VERO cell culture for detection of other arboviruses and to increase detection sensitivity for WNV. Molecular methods are highly sensitive, but only assay a very small amount of sample; cell culture is also a very sensitive technique and allows for the testing of a much larger sample volume.

Table 1 Trend in submissions of avians for WNV detection.

year	# birds submitted	% change
2007	172	-38%
2006	286	55%
2005	184	-68%
2004	571	-75%
2003	2320	-70%
2002	4073	-47%
2001	7675	na

Figure 1. Trends in submissions of avian specimens for arbovirus isolation.



A total of 210 specimens: 97 dead birds, 75 avian cloacal swabs, 37 mammal and 1 reptile tissues were received for virological assay during 2007. This is an overall decrease of 48% from 2006 (404 total submissions, 286 dead birds, 80 cloacal swabs, 38 mammals). Submissions were made from 36 counties. Non-avian specimens included: 32 horses, 1 deer, 1 orangutan, 1 rat, 1 rhinoceros, and 1 tortoise. WNV was not detected in any of these specimens. EEE virus was detected in 3 horses.

The greatest numbers of birds, 50 (49 dead, 1 cloacal swabs), including 16 doves, were submitted by Dade County. Specimens were submitted from 48 species of birds.

Arboviruses were not detected in the birds. Data on submissions and WN test results for 2007 by county is presented in Table 2.

Table 2. Dead bird/mammal and live bird cloacal swab submissions for detection of arbovirus, by county, 2007

County	dead birds	cloacal swabs	mammals	reptiles	EEE+
Alachua	1	0	5	1	1 horse
Bay	0	0	1		
Brevard	0	1	1		
Broward	0	0	0		
Citrus	0	1	0		
Collier	0	2	0		
Dade	50	1	0		
Duval	1	0	2		1 horse
Gilchrist	1	0	0		
Hernando	11	0	1		
Hillsborough	21	1	3		

County	dead birds	cloacal swabs	mammals	reptiles	EEE+
Holmes	0	0	1		
Indian River	1	0	1		
Jefferson	1	0	0		
Lee	0	4	1		
Leon	0	0	1		
Levy	1	0	0		
Madison	1	0	0		
Manatee	1	6	0		
Marion	0	0	4		
Martin	1	0	1		
Monroe	0	5	1		
Okaloosa	0	1	0		
Orange	2	14	0		
Osceola	0	1	2		
Palm Beach	1	4	2		
Pasco	0	0	3		
Pinellas	0	23	0		
Polk	0	1	0		
Putnam	0	0	1		
Santa_Rosa	0	0	1		
Sarasota	0	2	0		
Seminole	0	7	1		
Volusia	3	1	0		
Walton	0	0	1		
Washington	0	0	3		1 horse
totals	97	75	37	1	3

During 2007, 1831 traditional pools of mosquitoes were submitted from 9 counties across the state. Molecular (TaqMan) assays for WNV were performed on all submitted pools. It is important to determine whether the virus detected in a mosquito is viable (i.e., multiplies in cell culture) as part of ascertaining vector potential of the various species. Additionally, extracts of some mosquitoes seem to contain inhibitors of RT-PCR, resulting in false negative molecular assays. Thus VERO cell cultures were also inoculated with homogenized pools.

Commercial assays for WNV antigen in mosquito pools (RAMP) were used by some mosquito control agencies. They sent residual samples from 6 RAMP tests to TBL for confirmation. RNA specimens from 8 pools were also submitted for confirmation. Because these samples are inactivated, they can be tested only by RT-PCR; cell culture is not possible. None of these samples were confirmed positive for WN. There were no isolations of WN or EEE from mosquitoes in 2007. One isolate was made from a pool of *Anopheles crucians*

from Sarasota County. It was identified as a member of the California virus group. Submissions and numbers of positive pools are presented in table 3.

Table 3. Mosquitoes submitted for arbovirus testing.

County	total # pools	traditional	# RNA	#RAMP
Bay	40	40		
Duval	35	35		
Escambia	31	31		
Flagler	298	290	8	
Hillsborough	3	3		
Monroe	5	0		5
Pinellas	19	19		
Sarasota	1405	1404		1
Walton	9	9		
totals	1845	1831	8	6

The “Sentinel Chicken” surveillance program has long been a mainstay of arbovirus surveillance in Florida. Mosquito control agencies or County Health Departments within participating counties maintained small flocks of chickens at various sites in their area. The birds were bled at specified intervals, and the samples sent to our laboratory. All specimens received in the lab by 12 noon on Wednesday were processed and assayed in that week's test. The hemagglutination inhibition test (HAI) was used to ascertain the presence of antibody to Flavivirus (SLE/WNV) and to Alphavirus (EEE/HJ) viruses. Reports were expeditiously faxed to the submitters each Friday afternoon. Summary reports were also compiled and e-mailed to County Health Departments, Mosquito Control Agencies and other interested stakeholders. The Department of Health uses this data in its determination of whether to issue/call off Medical Alerts.

The HAI test used in this laboratory is a broadly reactive screening test, and detects total antibodies developed to WN, SLE, EEE and HJ viruses. An additional advantage of the HAI assay, is that serum from any vertebrate species can be analyzed by this method. Thus, our surveillance program is capable of detecting the presence of all these arboviruses in sentinel chickens, wild birds, mammals and reptiles. Nevertheless, to ascertain which virus is present requires additional testing.

The IgM Elisa assay provides a means to distinguish between antibody to SLE or to WN with sera from humans or chickens, but not other animals; some cross-reactions may occur in this assay. Sentinel sera which reacted with SLE antigen in the HAI test were deemed “flavivirus positive” and if sufficient residual serum was available, were assayed by the Chicken IgM Elisa for antibody to SLE and to WN antigens, the week following the HAI test, with results reported on Tuesday. Additionally, sera that were reactive with EEE antigen were deemed “alphavirus positive” and were tested for antibody to EEE by the IgM Elisa. Since IgM in

chickens appears to be of short duration (few weeks), ELISA negative or equivocal sera were then re-tested using a serum neutralization assay (SN) to confirm the presence of specific antibody.

The most specific test to distinguish between antibodies developed to these viruses is the serum neutralization assay. This quantitative assay uses infectious virus of each type to challenge the test serum. Cell cultures are then inoculated with the serum-virus mixture and the protective effect of the serum, that is, its ability to neutralize the lethality of the virus, is calculated. The serum neutralization assay is complex, hazardous and requires a significant amount of technologist time. Sera from animals other than chickens, e.g., from wild birds or mammals, are confirmed by the SN assay. Flavivirus positive sera are assayed against both WN and SLE viruses; alphavirus positive sera are assayed against both EEE and HJ viruses.

During 2004, Highlands J (HJ) virus was added to the SN protocol based on the MSPH thesis work of staff member Christy Ottendorfer. HJ virus cross-reacts to a limited extent with EEE in the HAI assay, however, it is not known to be a human pathogen. Thus, a positive test for HJ does not indicate the same risk of disease as does a positive EEE result and control measures would not be as critical. Both viruses frequently co-circulate (Table 4).

Table 4: Total Alphavirus sentinel seroconversions by year and strain

	total alphavirus	EEE	HJ	% EEE
2007	129	113	16	88%
2006	85	79	6	93%
2005	450	342	108	76%

In 2007, 47,803 sera from 2,752 individual sentinel birds at 282 sites in 33 counties were assayed by HAI. Sera from 1,885 non-sentinel avians (26 species) and 24 mammals (7 species) were also assayed in (HAI, SN) assays for the detection of antibody to WNV and to EEE. Data are presented in table 11. It must be noted that this is prevalence data and not necessarily an indicator of incident (recent) infection. Of these birds, 6.3% had alphavirus antibody detected in the HAI test to and 0.7% had flavivirus antibody (2006: 7.2% and 2.4%; 2005: 24.2% and 2.1% respectively). Four birds had antibody to both WN and EEE.

Table 5. Non-sentinel avian serum assayed during 2007.

County	# submitted	alphavirus		flavivirus	
		# HAI +	% +	# HAI +	% +
Alachua	2	0	0.0%	0	0.0%
Hillsborough	3	0	0.0%	0	0.0%
Okaloosa	507	51	10.1%	4	0.8%
Santa Rosa	463	32	6.9%	8	1.7%
Walton	518	20	3.9%	1	0.2%
Washington	392	15	3.8%	1	0.3%
Total	1885	118	6.3%	14	0.7%
panhandle birds	1880	118	6.3%	14	0.7%

Figures 2a and 3a depict numbers of monthly positive sentinel seroconversions since 1988, for Alphavirus (EEE/HJ) and Flavivirus (SLE/WNV) respectively. Figures 2b and 3b depict rates of seroconversion. As the numbers of sentinels has changed significantly over the years, for a meaningful interpretation of the data, it is essential that rates of seroconversion rather than just numbers of positive birds be compared.

Table 6 compares annual seroconversions by region with the regional historical means. Due to small numbers of historical data points, the North and Panhandle regions have been combined and the Mean Annual Seroconversion Rate (MASR) computed for the combined regions. Alphavirus transmission activity was at average historical levels, even though the protracted drought reduced mosquito levels statewide. On the other hand, flavivirus activity in the south and central regions of the state was significantly below mean levels. These are regions with traditionally high levels of activity.

Table 6a. Mean annual seroconversions rates (MASR) to alphavirus by region, 2007 and 2006. Compare regional total annual alphavirus rate with the MASR for that region.

Alphavirus	South	Central	<i>North</i>	<i>Panhandle</i>	North & Panhandle
EEE: 2007	0.00	1.19	<i>6.49</i>	<i>10.10</i>	7.60
HJ: 2007	0.18	0.00	<i>0.85</i>	<i>1.68</i>	1.11
total Alphavirus: 2007	0.18	1.19	<i>7.43</i>	<i>11.78</i>	8.70
EEE: 2006	0.00	0.37	<i>4.00</i>	<i>7.92</i>	5.05
HJ: 2006	0.00	0.00	<i>0.36</i>	<i>0.50</i>	0.40
total Alphavirus: 2006	0.00	0.37	<i>4.36</i>	<i>8.42</i>	5.45
Alphavirus: MASR	0.23	1.97			10.04
Alphavirus: MASR 95% CI	0.03-0.43	0.46-3.48			7.92-12.16

Table 6a. Mean annual seroconversions rates (MASR) to flavivirus by region, 2007 and 2006. Compare regional total annual flavivirus rate with the MASR for that region.

Flavivirus	South	Central	<i>North</i>	<i>Panhandle</i>	North & Panhandle
SLE: 2007	0.36	0.00	<i>0.00</i>	<i>0.00</i>	0.00
WN: 2007	0.18	0.00	<i>1.91</i>	<i>11.54</i>	4.87
total Flavivirus: 2007	0.54	0.00	<i>1.91</i>	<i>11.54</i>	4.87
SLE: 2006	4.00	1.71	<i>0.27</i>	<i>0.00</i>	0.20
WN: 2006	0.17	0.85	<i>1.00</i>	<i>2.72</i>	1.46
total Flavivirus: 2006	4.17	2.56	<i>1.27</i>	<i>2.72</i>	1.66
Flavivirus: MASR	19	11.8			3
Flavivirus: MASR 95% CI	11.11-26.97	5.59-17.99			0.8-5.24

Figure 2a. Numbers of sentinel seroconversions to alphavirus antibody positive by month, 1988-2007.

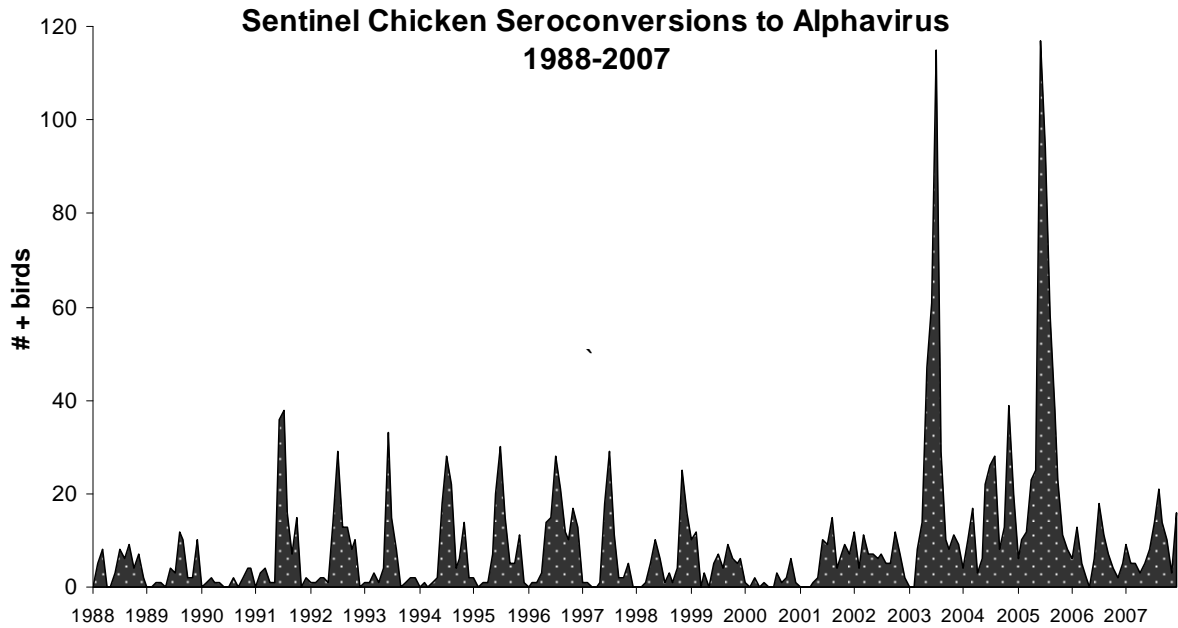


Figure 2b. Rate of sentinel seroconversions to alphavirus antibody positive by month, 1988-2007.

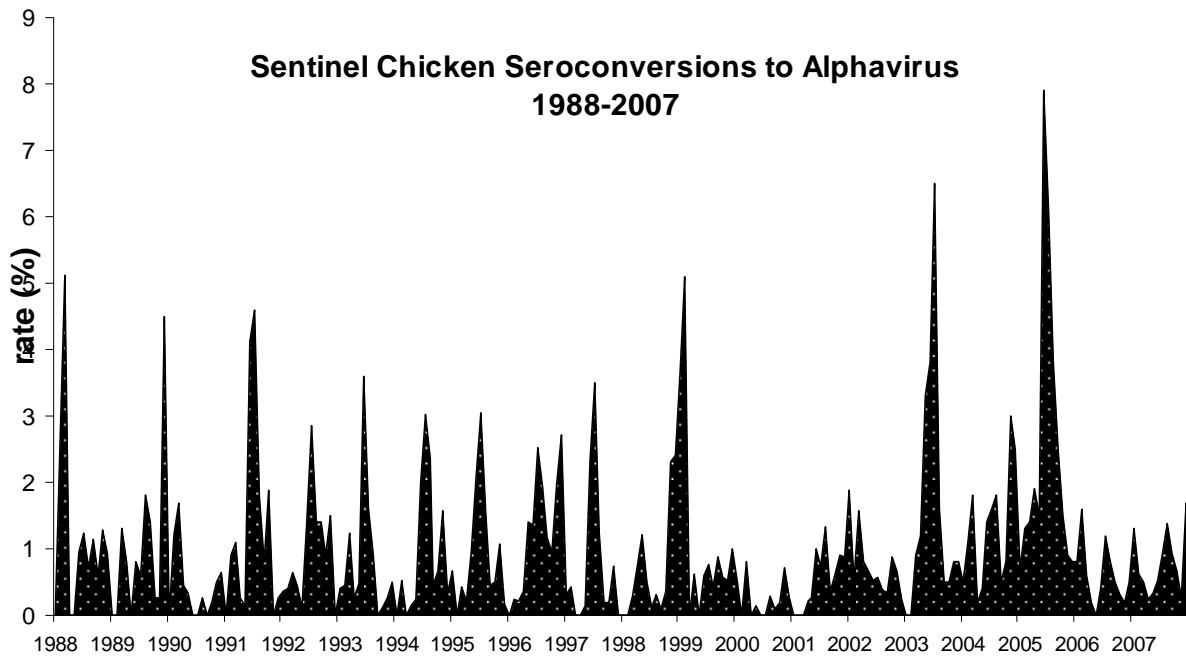


Figure 3a. Numbers of sentinel seroconversions to flavivirus antibody positive by month, 1988-2007.

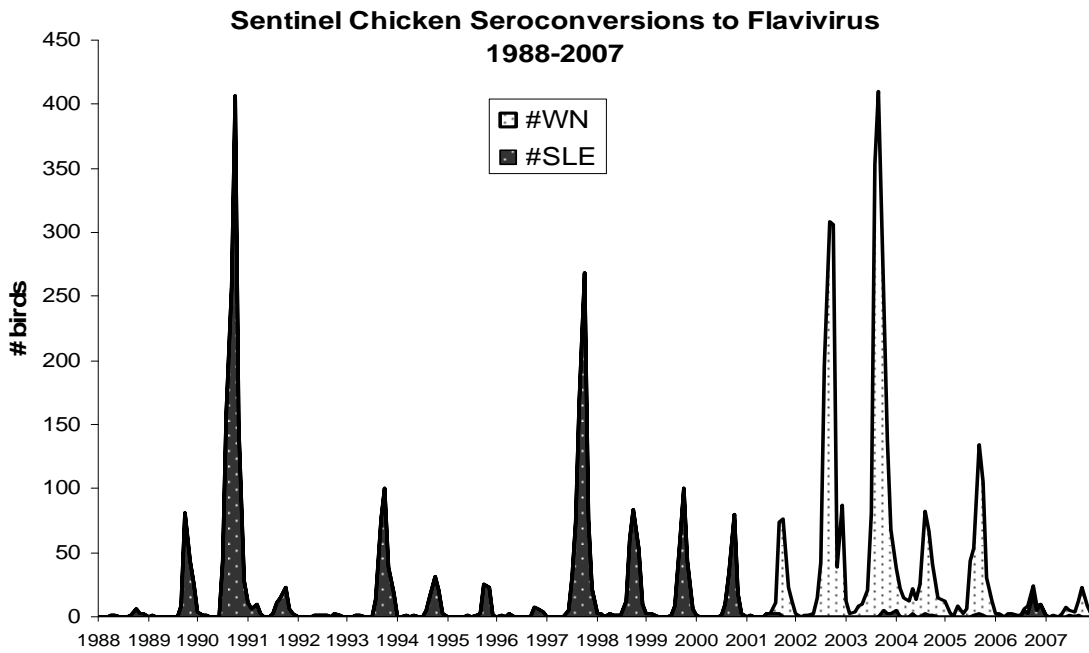
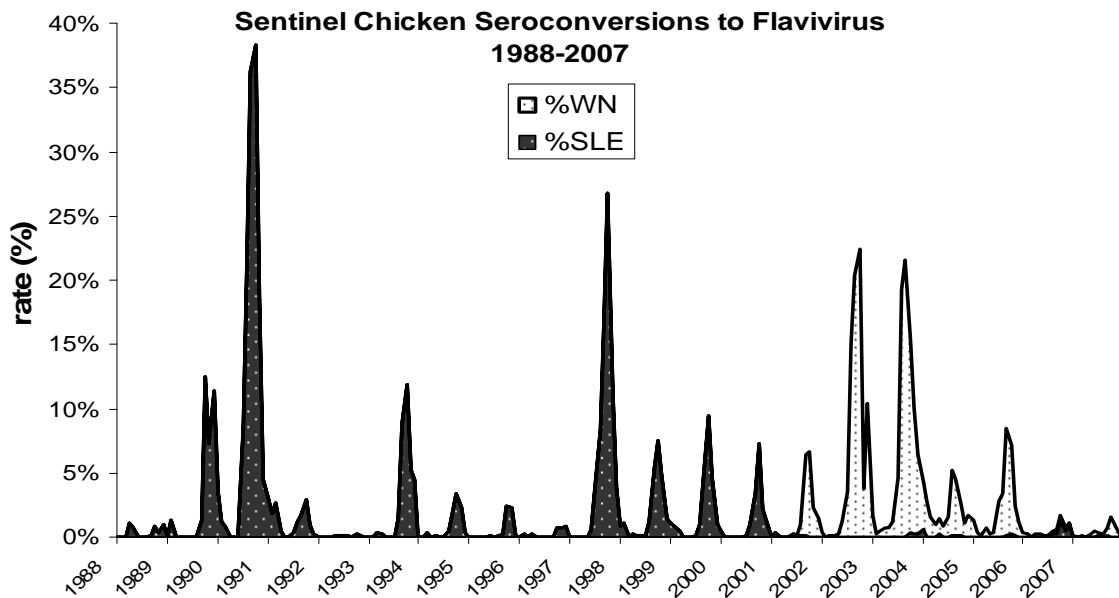


Figure 3b. Rate of sentinel seroconversions to flavivirus antibody positive by month, 1988-2007.



Of the 67 counties in Florida, 33 submitted sera for arbovirus surveillance last season. This is an increase from 27 counties participating in 2001. Degree of participation varied amongst the regions. (Figure 4 a and b)

Figure 4a. The # of sentinels exposed in each region of the state by month

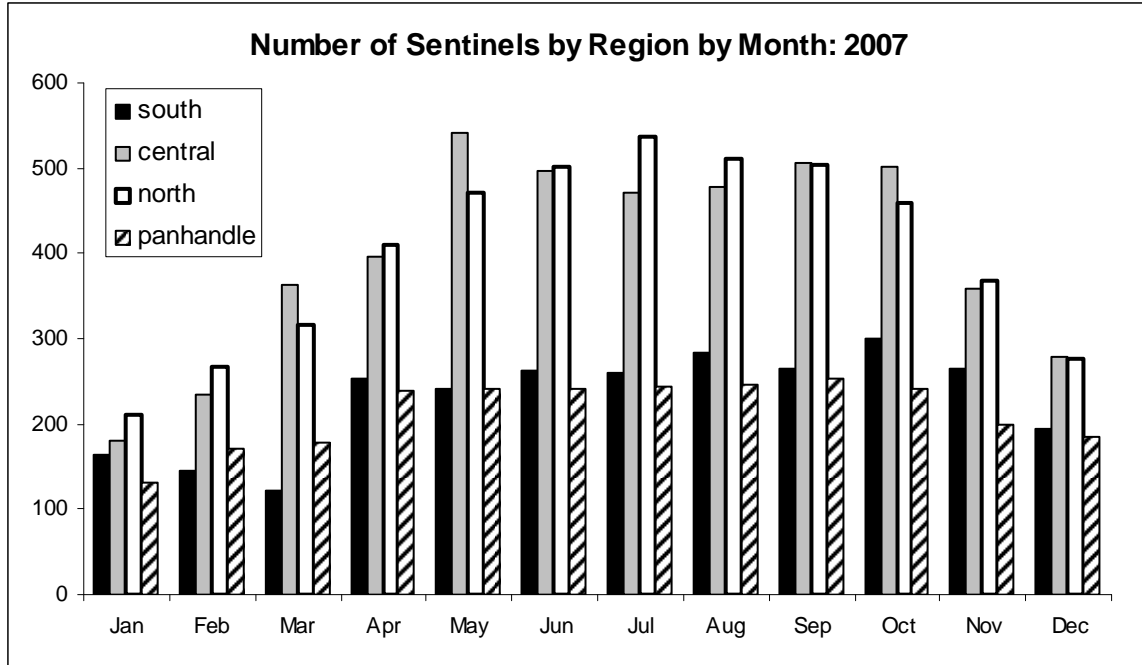


Figure 4b: The number of sentinel sera submitted by month from each state region.

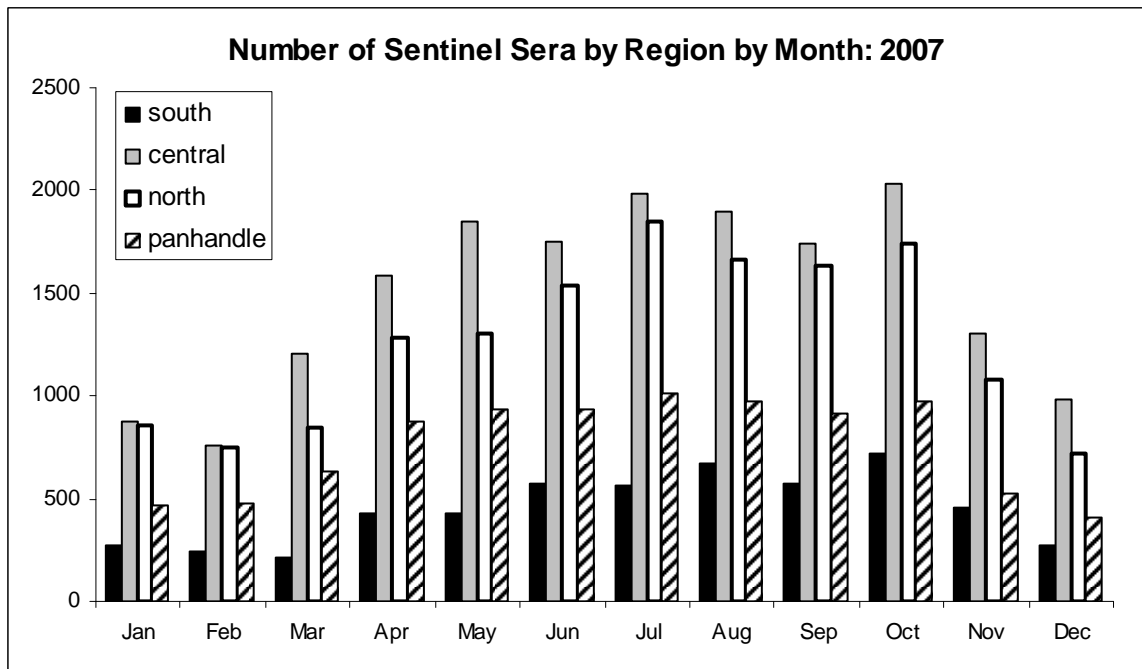


Table 7a provides a listing of the counties which participated during 2006, the numbers of sites and birds they maintained, the number of sera they submitted, the numbers of sentinels which seroconverted to EEE, HJ, SLE and WN viruses and the percent of exposed birds which seroconverted. Seroconversion dates are given in table 7b.

Table 7a Arbovirus Surveillance REPORT: Sentinel flock activity by county

County	number of			# of Sentinels Seroconverting				% of Seroconversion			
	Sites	birds	sera	EEE	HJ	SLE	WN	EEE	HJ	SLE	WN
Alachua	6	43	392	1	0	0	0	2.3	0.0	0.0	0.0
Bay	3	26	833	0	0	0	7	0.0	0.0	0.0	26.9
Brevard	12	78	1779	1	0	0	0	1.3	0.0	0.0	0.0
Charlotte	8	32	657	0	0	0	0	0.0	0.0	0.0	0.0
Citrus	7	42	1057	0	0	0	0	0.0	0.0	0.0	0.0
Collier	6	86	631	0	1	0	0	0.0	1.2	0.0	0.0
Dade	4	37	331	0	0	0	0	0.0	0.0	0.0	0.0
Duval	6	43	1024	1	0	0	1	2.3	0.0	0.0	2.3
Escambia	2	14	309	0	0	0	3	0.0	0.0	0.0	21.4
Flagler	7	58	473	1	0	0	0	1.7	0.0	0.0	0.0
Glades	1	13	138	0	0	0	0	0.0	0.0	0.0	0.0
Gulf	3	19	518	2	0	0	1	10.5	0.0	0.0	5.3
Hendry	3	29	257	0	0	0	0	0.0	0.0	0.0	0.0
Hillsborough	12	191	3377	3	0	0	0	1.6	0.0	0.0	0.0
Indian River	8	104	1665	1	0	0	0	1.0	0.0	0.0	0.0
Jackson	4	15	274	2	0	0	0	13.3	0.0	0.0	0.0
Lee	18	240	1699	0	0	2	0	0.0	0.0	0.8	0.0
Leon	7	47	1091	1	1	0	0	2.1	2.1	0.0	0.0
Manatee	13	127	3592	1	0	0	0	0.8	0.0	0.0	0.0
Martin	8	17	452	0	0	0	0	0.0	0.0	0.0	0.0
Nassau	5	56	485	34	2	0	0	60.7	3.6	0.0	0.0
Orange	19	383	5441	17	5	0	1	4.4	1.3	0.0	0.3
Osceola	9	81	551	4	0	0	0	4.9	0.0	0.0	0.0
Palm Beach	9	103	1267	0	0	0	1	0.0	0.0	0.0	1.0
Pasco	6	39	793	0	0	0	0	0.0	0.0	0.0	0.0
Pinellas	8	91	2940	0	0	0	0	0.0	0.0	0.0	0.0
Putnam	9	57	540	4	0	0	6	7.0	0.0	0.0	10.5
Sarasota	14	114	2899	0	0	0	0	0.0	0.0	0.0	0.0
Seminole	3	18	238	0	0	0	0	0.0	0.0	0.0	0.0
St. Johns	10	129	2444	1	1	0	10	0.8	0.8	0.0	7.8
St. Lucie	7	53	1185	0	0	0	0	0.0	0.0	0.0	0.0
Volusia	16	72	2372	2	0	0	0	2.8	0.0	0.0	0.0
Walton	29	295	6099	37	6	0	37	12.5	2.0	0.0	12.5
	282	2752	47803	113	16	2	67				

Table 7b Arbovirus Surveillance REPORT: Sentinel flock activity by county: dates of seroconversion

County	Week of Sero Conversion (Confirmed)
Alachua	EEE: 9/17(1)
Bay	WN: 8/21(1), 9/4(2), 9/11(1), 10/16(1), 10/30(2)
Brevard	EEE 9/12(1)
Charlotte	
Citrus	
Collier	HJ: 3/19(1)
Dade	
Duval	WN: 7/9(1); EEE: 8/7(1)
Escambia	WN: 9/4(1), 10/9(1), 10/16(1)
Flagler	EEE: 7/2(1)
Glades	
Gulf	EEE 7/2(2); WN: 7/2(1)
Hendry	
Hillsborough	EEE: 4/3(1), 5/29(1), 6/5(1)
Indian River	EEE: 10/11(1)
Jackson	EEE: 3/27(2 ⁿ)
Lee	SLE: 7/9(1), 9/4(1)
Leon	EEE 5/7(1); HJ: 6/25(1)
Manatee	EEE: 7/23(1)
Martin	
Nassau	EEE: 6/11(1), 6/25(1), 7/2(2), 7/9(2), 7/23(2), 7/30(2), 8/13(7), 8/20(4), 9/3(3), 9/10(2), 9/17(2), 10/1(6); HJ: 8/27(1), 9/10(1)
Orange	EEE: 1/11(1), 1/18(1), 1/25(2), 2/1(3), 2/8(1),3/5(2),7/9(1),8/3(1),8/30(1),12/13(2), 12/20(1), 12/27(1); HJ: 2/22(1), 6/7(1), 6/21(1), 6/28(1), 7/9(1); WN: 6/14(1)
Osceola	EEE: 1/4(1), 7/5(1), 11/1(1), 11/15(1)
Palm Beach	WN: 11/5(1)
Pasco	
Pinellas	
Putnam	EEE: 5/11(1), 6/14(1), 8/16(1), 8/30(1); WN: 6/8(2 ⁿ), 6/21(1), 6/28(1), 10/13(1), 10/26(1)
Sarasota	
Seminole	
St. Johns	EEE: 8/13(1); HJ: 5/21(1); WN: 8/20(1), 9/10(3), 9/17(1), 9/24(1), 10/3(3), 11/5(1)
St. Lucie	
Volusia	EEE: 12/31(2)
Walton	EEE: 1/11(3), 1/24(1), 2/13(1), 3/21(1), 4/9(2), 5/7(2), 6/4(1), 6/11(1), 6/25(2), 8/20(3), 8/21(1), 9/4(3), 9/24(2), 10/12(3), 11/27(1), 12/5(5), 12/11(5); HJ: 3/21(2), 4/9(1), 5/21(1), 7/9(2); WN: 1/9(1), 1/11(1), 3/19(1), 5/1(2), 5/9(1), 6/18(2), 7/9(1), 7/30(1), 8/13(2), 9/12(2), 10/1(3), 10/3(3), 10/5(2), 10/8(1), 10/15(1), 10/29(1), 10/17(3), 11/1(3), 11/13(4), 12/10(1), 12/17(1)

There are still substantial areas of the state that are not monitored. Sampling is clustered, primarily in the “traditional SLE belt” across the central and northern regions of the state and hence, the distribution of virus activity appears clustered both in space and time. Counties initiate and terminate annual surveillance activity at various times during the year and thus there is a risk of missing detection of critical early season viral amplification. It would be of value for our understanding and future control of arbovirus outbreaks, if these currently underrepresented areas of the state could be encouraged to develop an appropriate surveillance program.

Figures 5, 6, 7, 8, 9, 10 and 11 show, respectively, for each county: the numbers of surveillance sites maintained, the total number of susceptible chickens exposed during 2007, the number of serum samples which were submitted from exposed birds, the number of sentinel birds which seroconverted to EEE, the number of birds which seroconverted to HJ, the number of birds which seroconverted to SLE and the number of birds which seroconverted to WNV during 2007. Figures 12, 13, 14 and 15 depict the rate of seroconversions to EEE, HJ, SLE and WNV, respectively, by month, for the four state regions. For comparative purposes, 2006 data is also shown.

Warm, wet winters may result in an extended arbovirus transmission season, indicating a need for year-round surveillance in much of the state. Nevertheless, drought conditions continued for much of 2007. Seroconversions to alphavirus (EEE and HJ) occurred every month of year albeit at a lower than mean level. Activity in all regions was within historical levels (Table 6a). Despite of the cold temperatures (for Florida) in these regions during the winter months, seroconversions in the panhandle exhibited a bimodal pattern, peaking in January and again in December, while seroconversion in the north region peaked in January, August and December. EE activity was low in the central region and was not detected in the southern region of the state. Highlands J virus activity was limited, detected at low levels in the panhandle from March through July and in the north in February and May through September. One sentinel seroconverted to HJ positive in the southern region in March.

Flavivirus (WN and SLE) activity for 2007 was significantly below the mean annual seroconversion rate in the south and central regions (Table 6b). There were no flavivirus seroconversions confirmed in central Florida during 2007. The rate of flavivirus seroconversions, all to WN, was higher than the mean for the north and panhandle, but not significantly. SLE activity was well below that of 2006, whereas WN activity was greater, primarily in the panhandle. There was a shift in the peak of WN seroconversions from the historical September high to October, reflecting the late start of the summer rains.

Figure 5. Number of sentinel surveillance sites for 2007, by county.

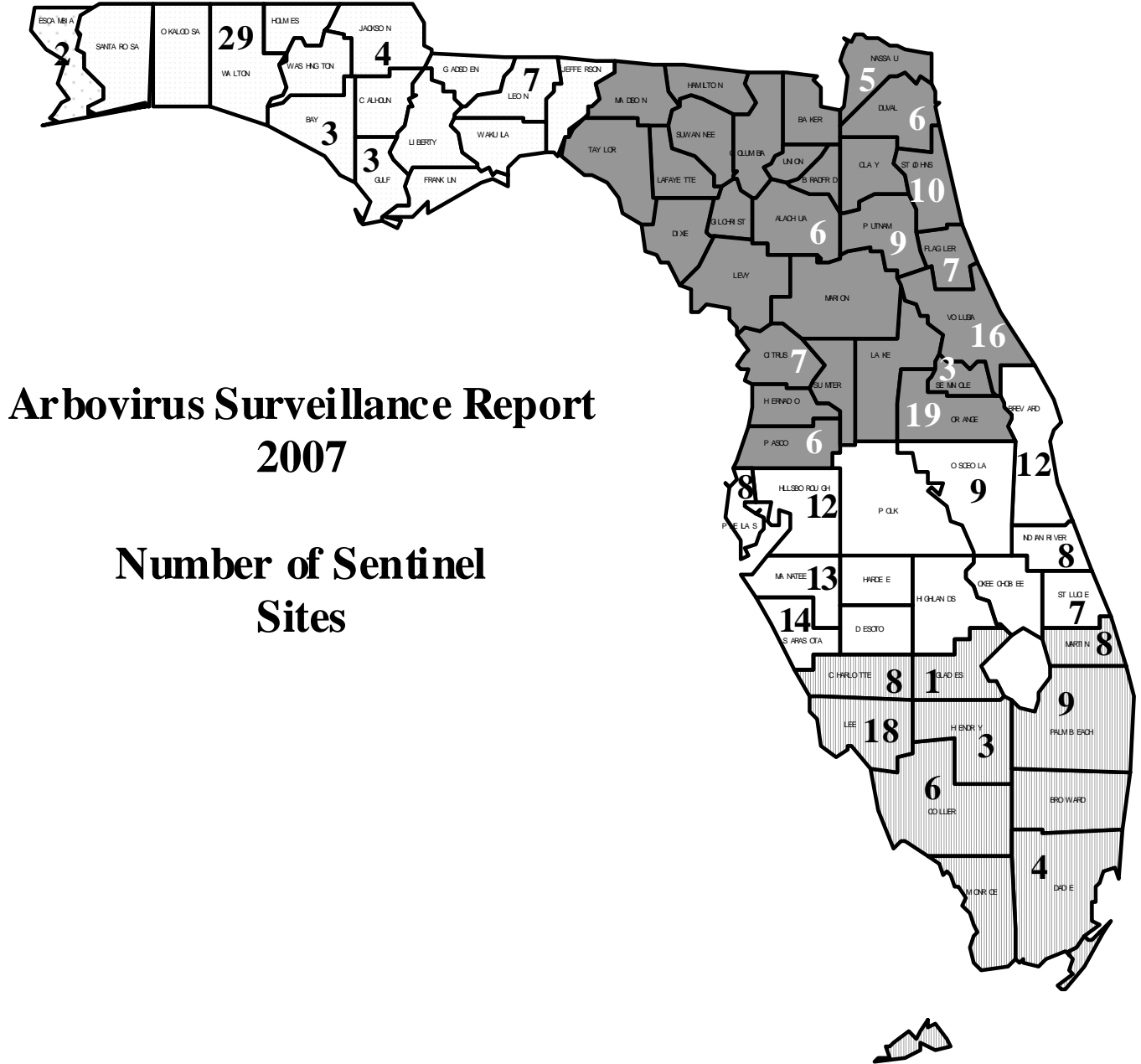
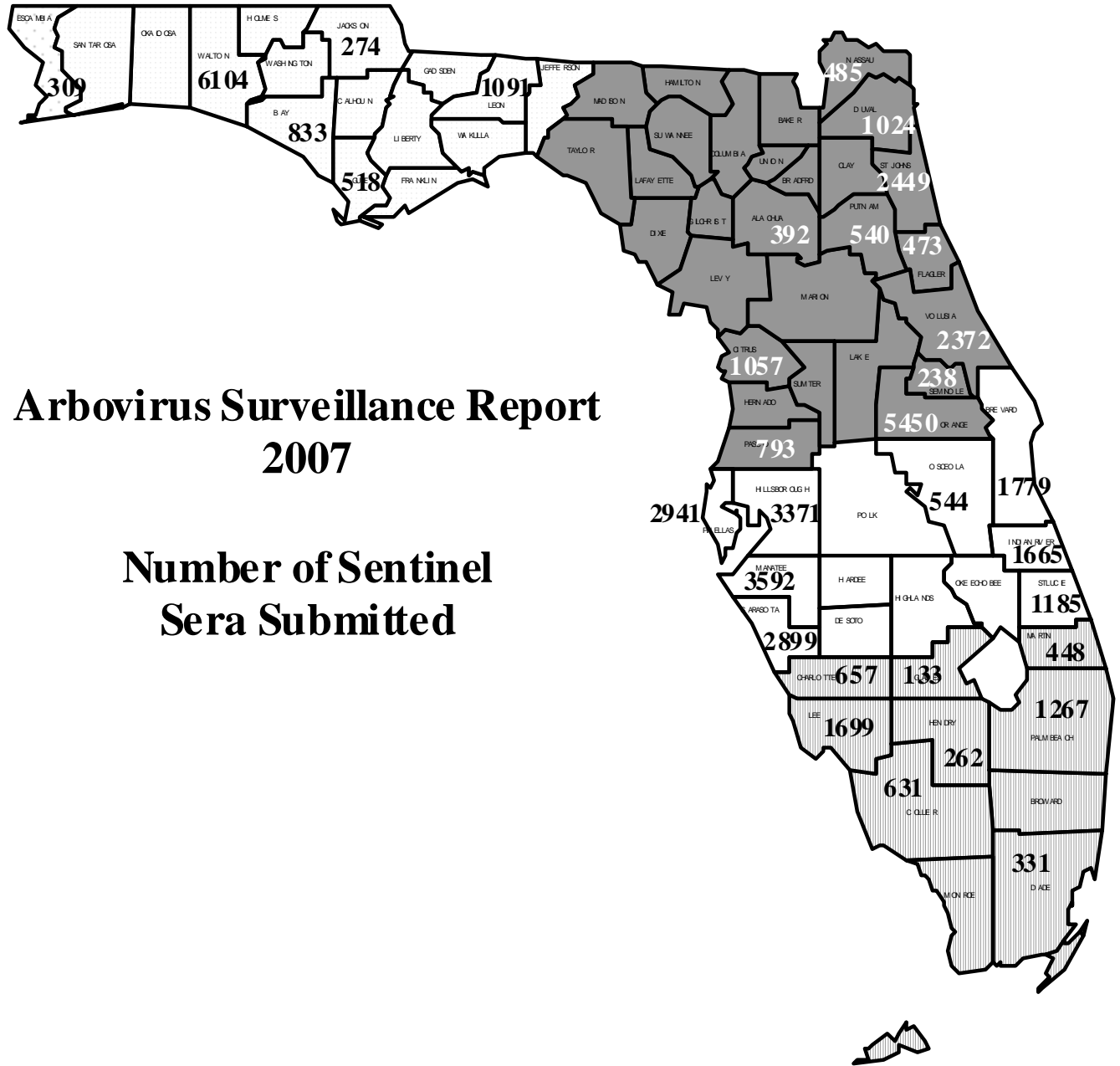


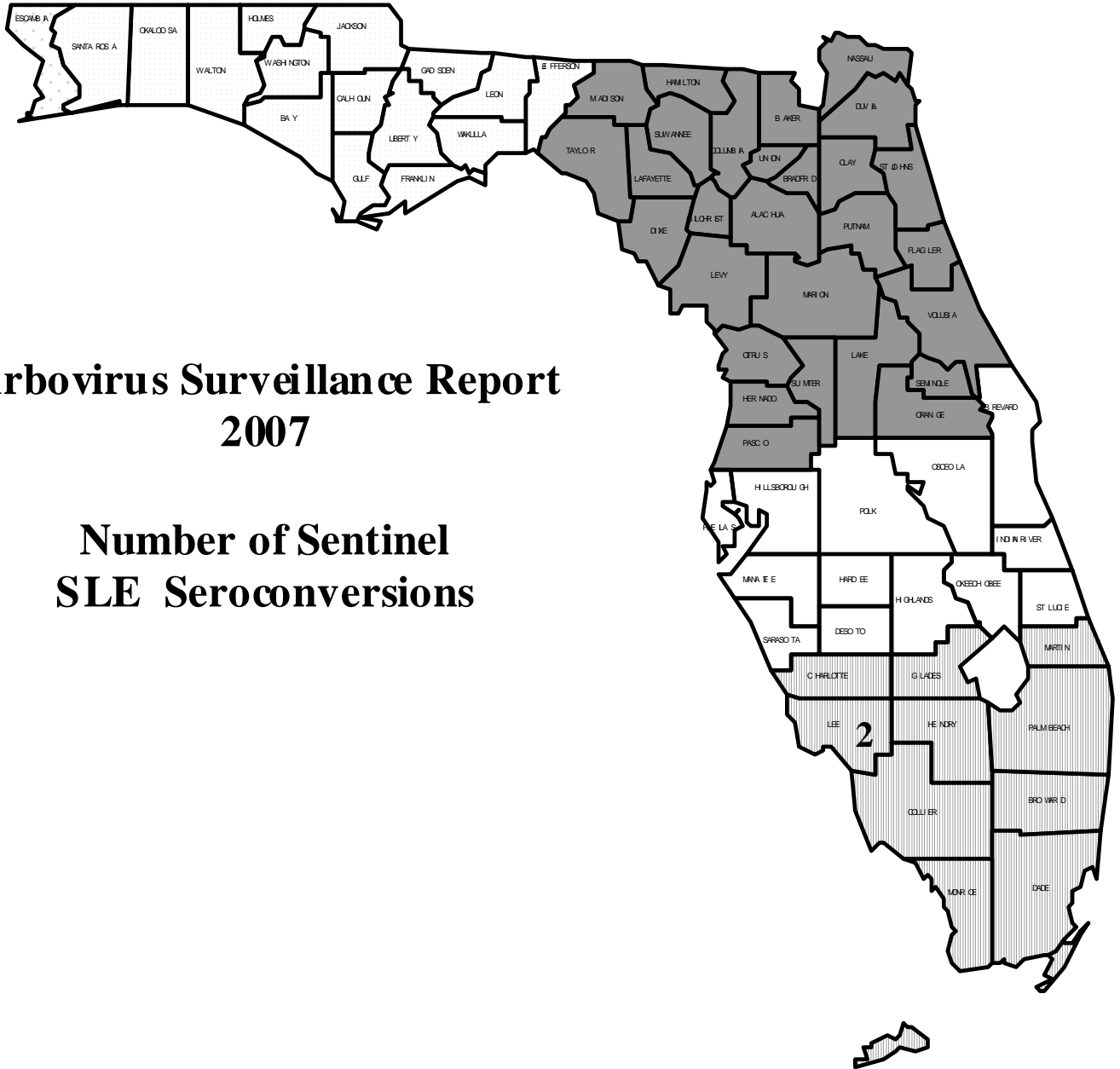
Figure 7. Number of serum samples submitted from exposed birds during 2007, by county.



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**Number of Sentinel
Sera Submitted**

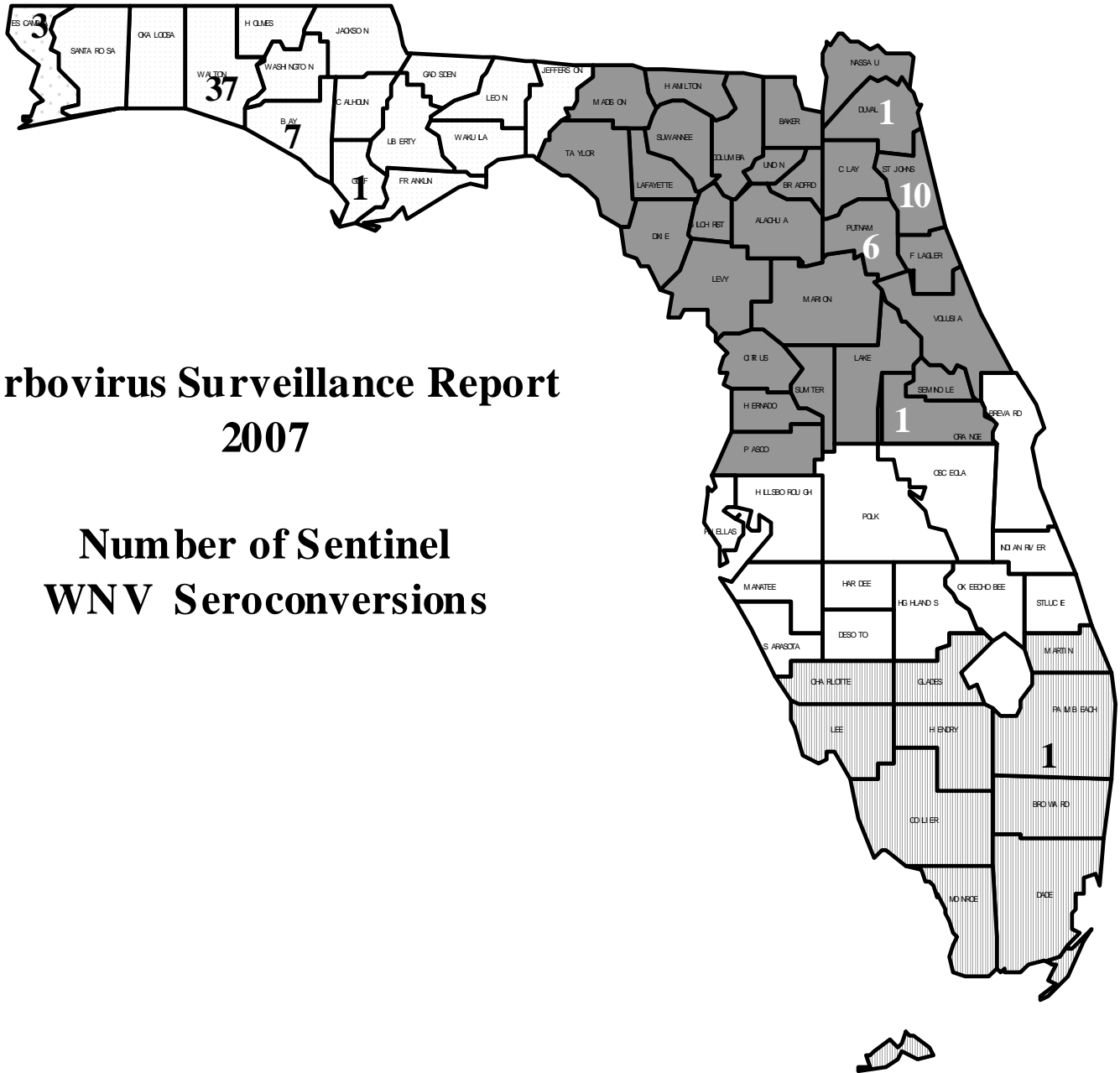
Figure 10. Number of sentinel birds seroconverting to SLE antibody positive during 2007, by county.



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2007**

**Number of Sentinel
SLE Seroconversions**

Figure 11. Number of sentinel birds seroconverting to WN antibody positive during 2007, by county.



Arbovirus Surveillance Report 2007

Number of Sentinel WNV Seroconversions

Figure 12a. Rate of sentinel seroconversion to EEE antibody positive during 2007, by region.

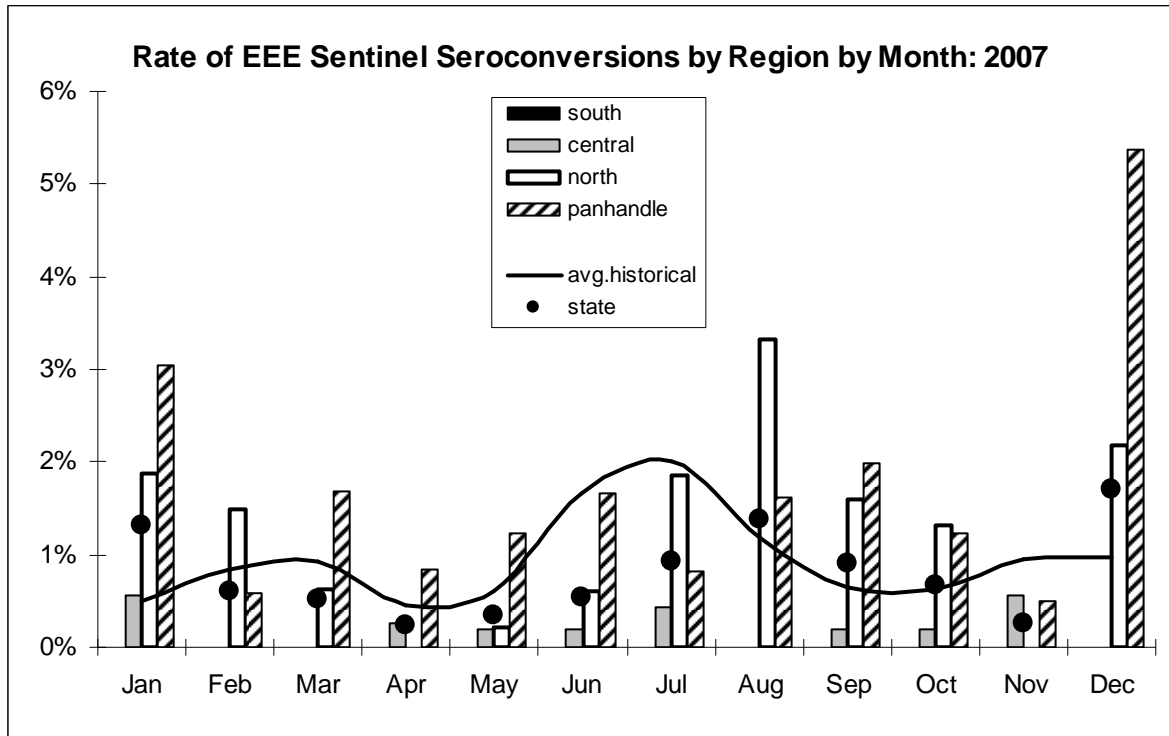


Figure 12b. Rate of sentinel seroconversion to EEE antibody positive during 2006, by region.

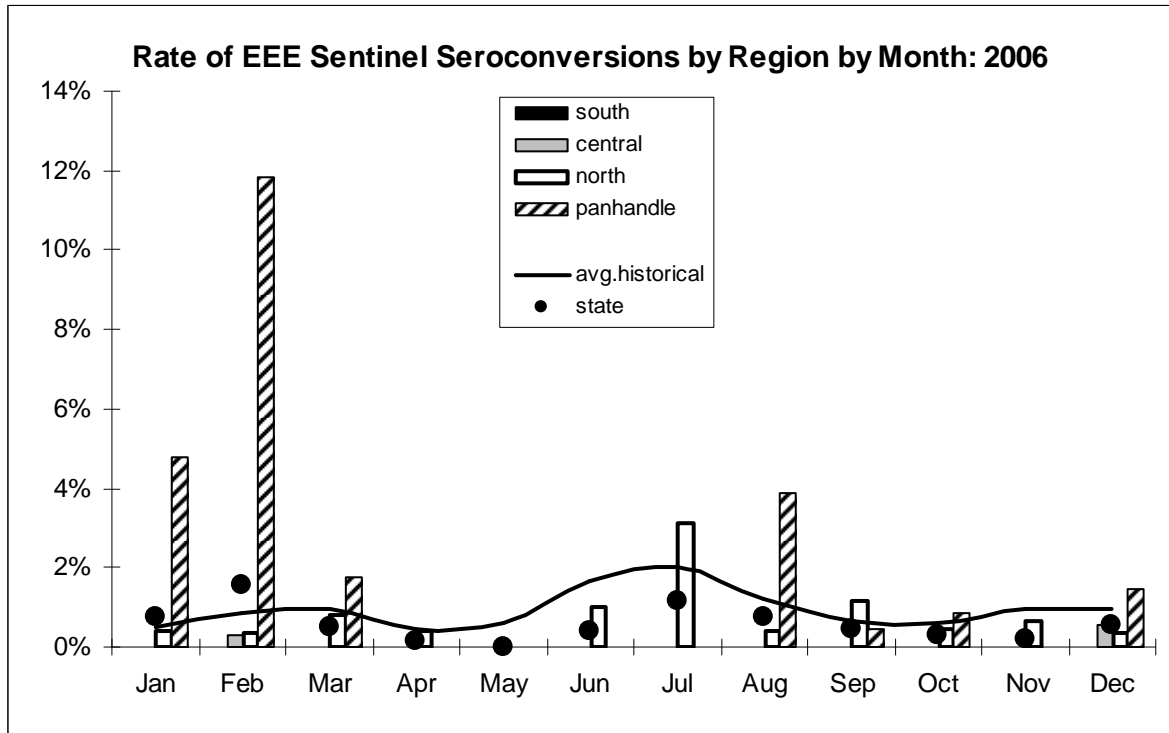


Figure 13a. Rate of sentinel seroconversion to HJ antibody positive during 2007, by region.

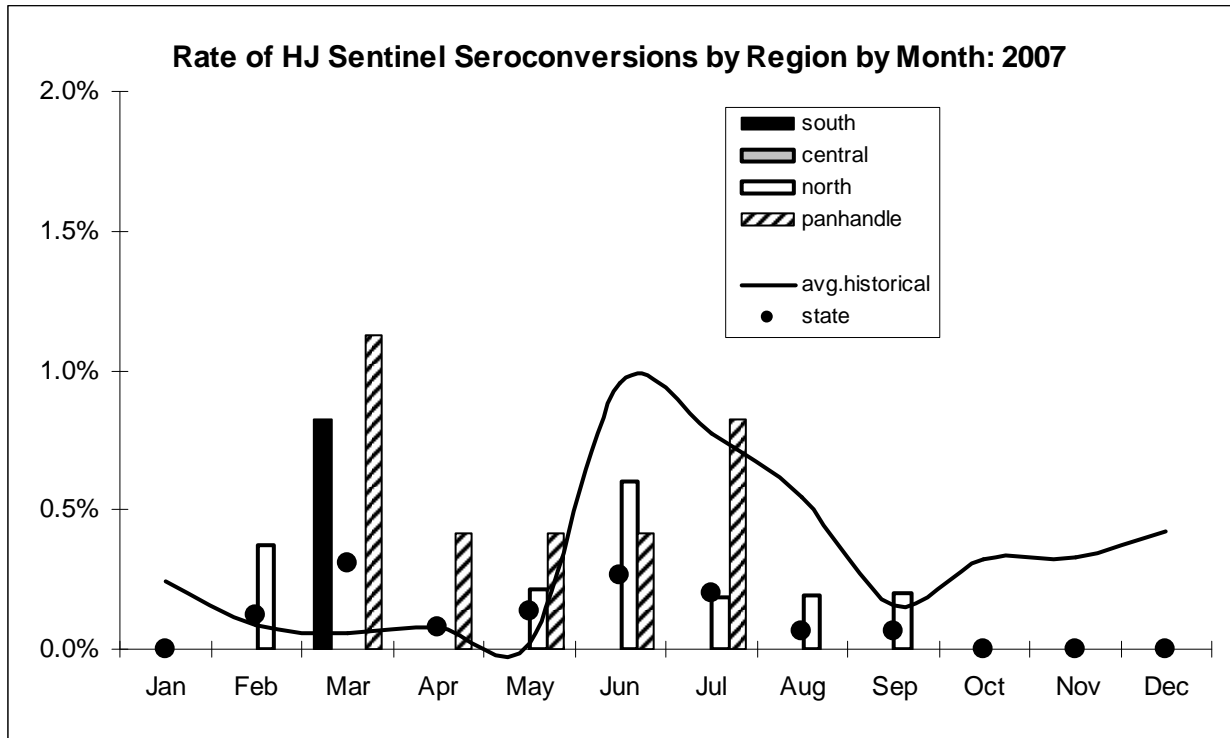


Figure 13b. Rate of sentinel seroconversion to HJ antibody positive during 2006, by region.

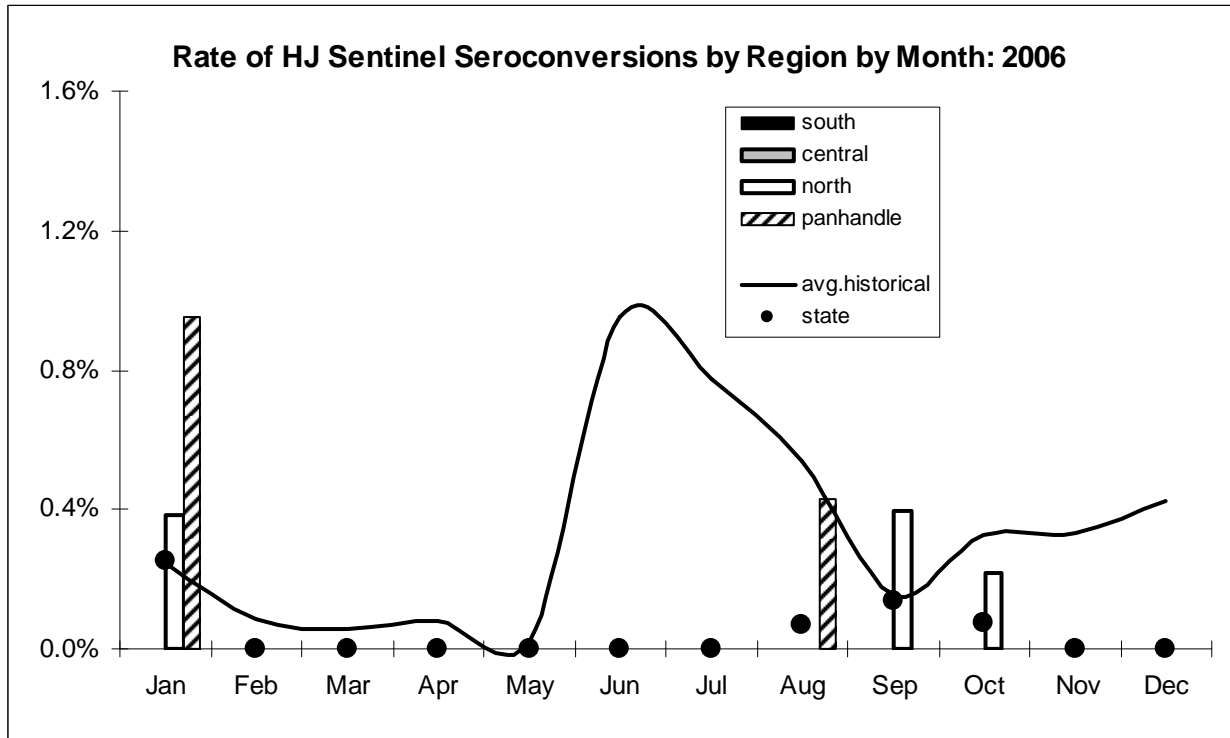


Figure 14a. Rate of sentinel seroconversion to SLE antibody positive during 2007, by region.

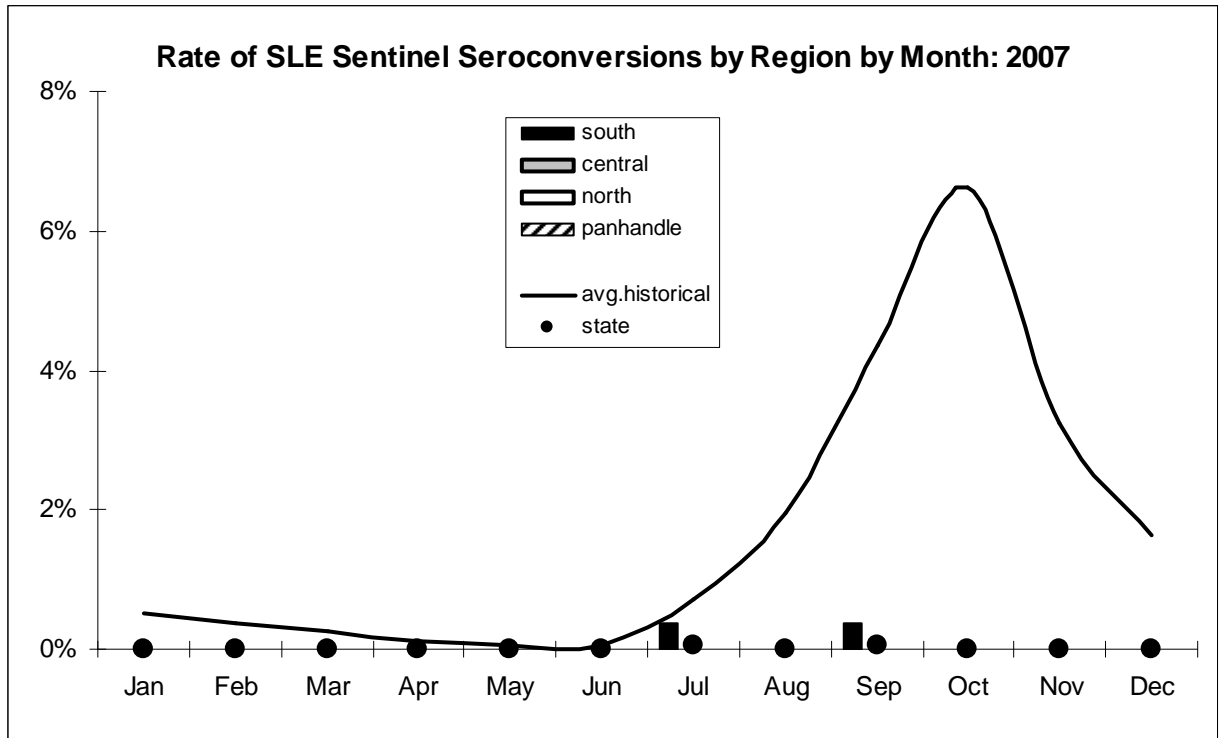


Figure 14b. Rate of sentinel seroconversion to SLE antibody positive during 2006, by region.

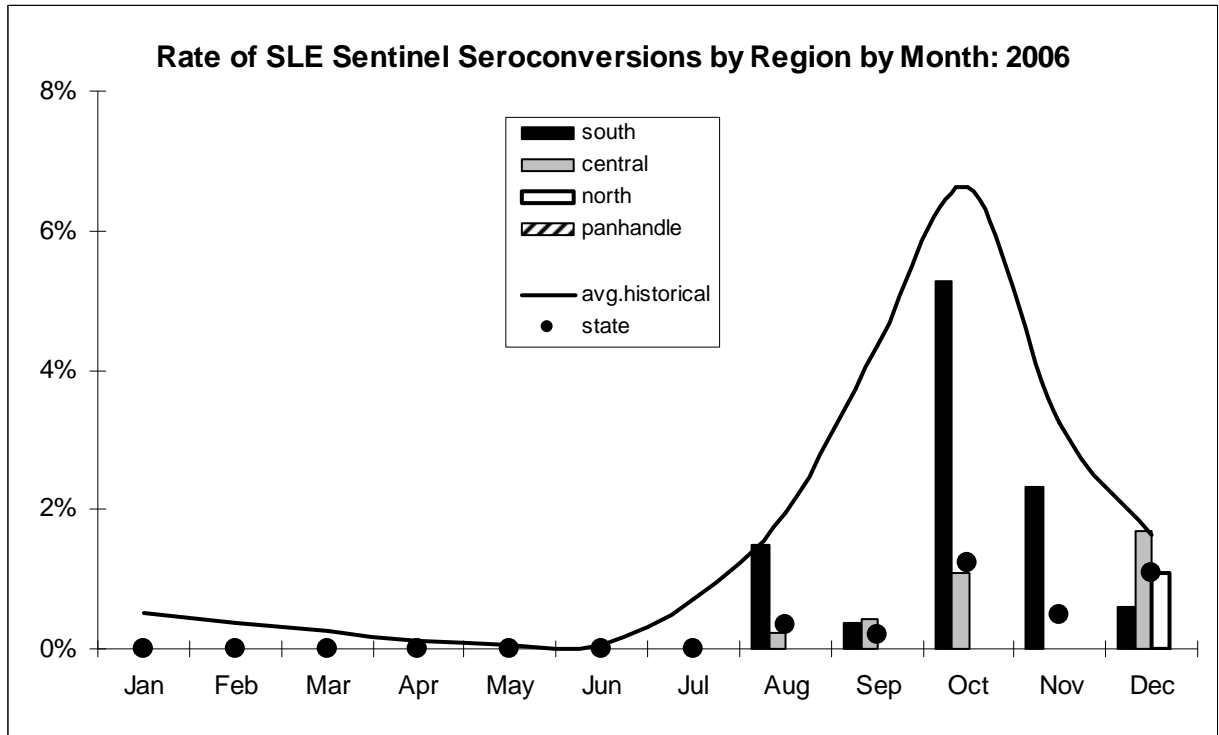


Figure 15a. Rate of sentinel seroconversion to WN antibody positive during 2007, by region.

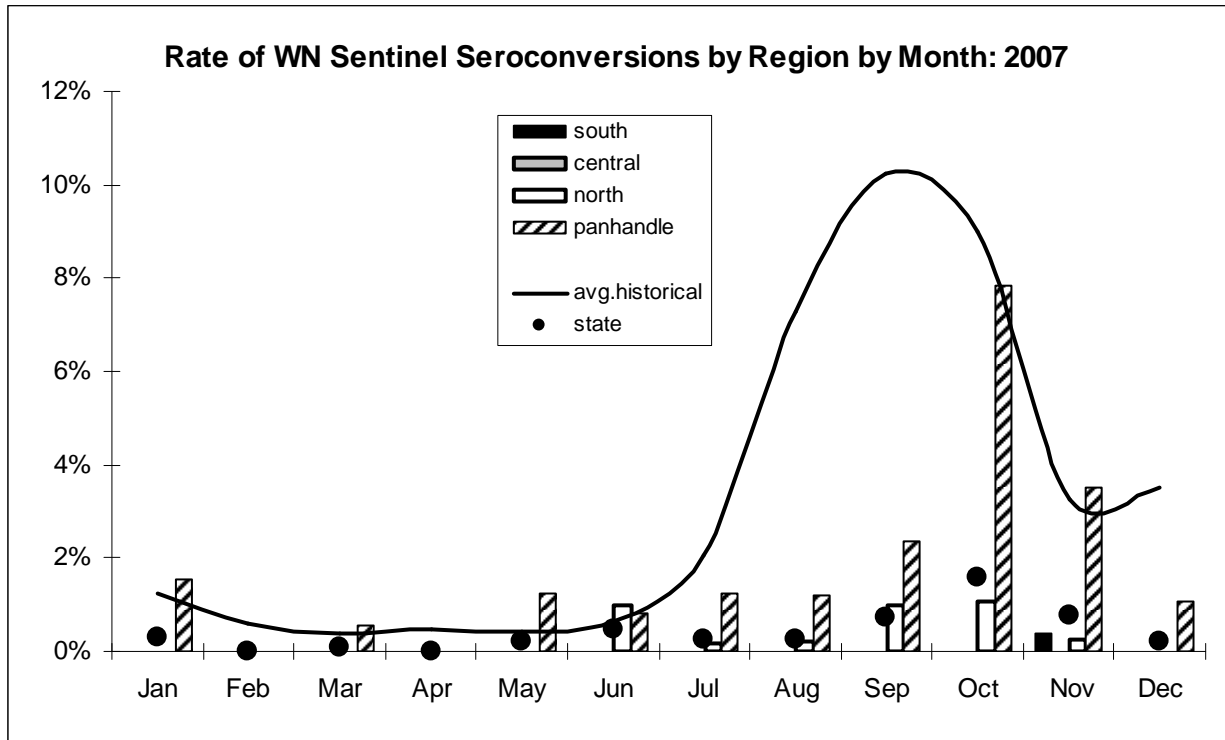
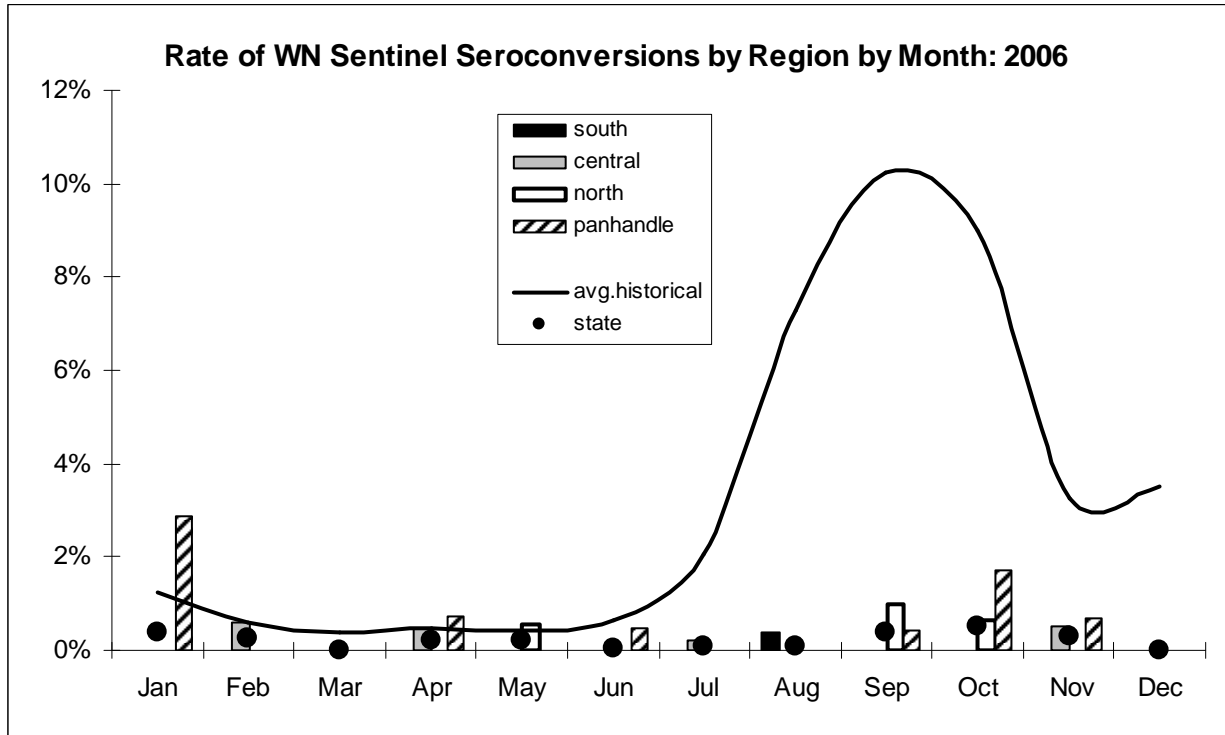


Figure 15b. Rate of sentinel seroconversion to WN antibody positive during 2006, by region.



Reflecting the low rate of activity seen with sentinel surveillance, there were no indigenous human arbovirus cases detected in 2007. One case of WN in a Florida resident was acquired out of state and 17 cases of imported dengue were detected. Sera and/or cerebrospinal fluid (CSF) from 550 clinically ill humans are submitted to the Jacksonville and Tampa Virology laboratories of the BOL. Assays (Table 8) are performed for detection of antibody to dengue viruses (DEN), eastern equine encephalomyelitis virus (EEE), St. Louis encephalitis virus (SLE), West Nile virus (WN) and Lacrosse (LAC) virus. Additionally, molecular (RT-PCR) assays for these agents were performed when warranted and CSF specimens cultured if received frozen. Echovirus type 6 was detected in one CSF from a 25 year old and dengue virus type 1 was detected in the serum of another client.

Table 8. Clinical arbovirus assays performed during 2007 at the BOL virology laboratories.

assay	number
IgM EIA	1092
IgG EIA	435
HAI	326
MIA	46
SN	34

In previous years, however, the sentinel program was demonstrably effective in reducing the numbers of cases that could have occurred had there been no active early-warning sentinel system. In 2005, human cases were fewer than in 2004 (21 vs. 41). This may be related to the location of the epicenter of human activity. In 2005, it was in central Florida; 86% of the cases occurred in Pinellas County. This area has a long history of participation in sentinel surveillance and when early season data suggested that west-central Florida was going to be the epicenter for a significant outbreak of WNV, mosquito control acted appropriately on surveillance data, the Department of Health released appropriate prevention messages in a timely manner and the press, primarily in areas with surveillance activities, disseminated them. In 2004, 62% of the cases (24) occurred in areas new to or not participating in the sentinel surveillance program. The 2004 season was mercifully cut short by our extraordinary hurricane activity.

A total of 101,430 HAI, 1,255 ELISA and 1,931 SN tests were performed on field specimens for arbovirus studies. This includes both the sentinel flock incidence studies, and wild bird sera submitted for prevalence studies. An average of 894 serum specimens were assayed by HAI each week.

During 2006, development began on a new method, the Microbead Immunoassay (MIA), with the goal of eventually replacing the HAI assay. This assay uses the Bioplex Instrument and is adapted from a CDC developed assay for clinical sera. The basic protocol for the flaviviruses (SLE, WN) with chicken sera was developed by Logan Haller, as her MSPH thesis project. Validation tests continued during 2007 and indicated a need to readjust cut-off values in order to reduce the high level of false positive results generated in the screening assay. During 2007 we began to develop the assay for the alphaviruses. These assays will be multiplexed during 2008. When validated, these assays should reduce turn-around-time for reporting confirmed sentinel seroconversions.

It must be noted that this very effective Arbovirus Sentinel Surveillance program is a success because of the efforts of its two full time technical staff, Maribel Casteneda and Rita Judge. They directed and trained OPS staff working on Arbovirus grants and student volunteers in the HAI protocol, while maintaining test quality control. Eddie Tensley, is responsible for the production of goose erythrocytes used each week as the indicator red blood cell in the HAI assay by both the Tampa and Jacksonville laboratories, and assists in specimen preparation. Ann Mitulinsky, Christy Ottendorfer/Jason Ambrose, and Anxhela Gyjushi, (OPS, ELC grant) performed HAI, Elisa, SN, dead animal and mosquito assays. Dr. Deno Kazanis and Dr. Lillian Stark supervise the field surveillance program and manage the data. Clinical testing is performed by Drs. Kazanis and Stark in the Tampa BOL and by Valerie Mock and Pam Colarusso in the Jacksonville BOL. The BOL Arbovirus Surveillance Team by working together in such a productive manner has enhanced our ability to provide useful data in a timely manner to a variety of concerned agencies.