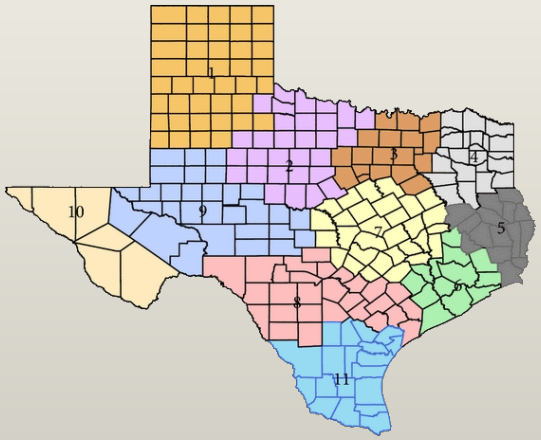
TEXAS Department of State Health Services

Infectious Diseases in Texas through 2015

What Condition Our Conditions Are In



ELC Conference - October 19th, 2016

Laura Tabony, MPH, M(ASCP)

Changes to Reportable Conditions

- 2015 – No Changes
- 2016 – Effective 4/3/16
  - Added neglected tropical diseases – Ascariasis, Echinococcosis, Fascioliasis, Hookworm (ancylostomiasis), Paragonimiasis, Trichuriasis
  - Change from specified arboviruses to all arbovirus infections
  - Change from invasive *Haemophilus influenzae* type b infection to all types
  - Change from Creutzfeldt-Jakob disease (CJD) to all Prion diseases, such as CJD
  - Changed from reportable immediately to 1 business day – Carbapenem resistant *Enterobacteriaceae* (CRE) and Multidrug-resistant *Acinetobacter* (MDR-A) species
  - Deleted Relapsing fever
- 2017 – In Progress
  - Influenza mortality – Change from pediatric to all influenza-associated deaths
  - Added required isolates – Diphtheria, invasive *Streptococcus pneumoniae* in children under 5 yrs, and *Salmonella* species
  - Changed reporting requirement – Mumps from 1 week to 1 business day and Influenza mortality from 1 business day to 1 week

Top Ten Conditions, 2015 and 2014

2015 Rank	Condition	2015 Count	2014 Count	2014 Rank
01	Salmonellosis	5,727	5,145	01
02	Shigellosis	5,623	2,743	02
03	Campylobacteriosis	3,944	2,589	03
04	Invasive Group B Streptococcus	1,703	1,356	08
05	05 - Invasive Streptococcus pneumoniae	1,693	1,562	06
06	06 - Pertussis	1,504	2,576	04
07	07 - Varicella	1,491	1,647	05
08	Multidrug-resistant Acinetobacter (MDR-A)	977	Combined Condition and Partial Year (aprox 1,400)	07
09	Carbapenem-resistant Enterobacteriaceae (CRE)	874		
10	Cryptosporidiosis	740	416	11
11	Invasive Group A Streptococcus	729	601	10
12	Shiga toxin-producing Eshericia coli (STEC)	610	612	09

Food and Water Borne (FB/WB): >100 Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Lines
Salmonellosis	3,060	3,534	5,583	3,964	4,929	5,218	4,990	4,946	5,145	5,727	
Shigellosis	2,065	2,358	4,665	2,295	2,626	2,539	1,926	2,386	2,743	5,623	
Campylobacteriosis	1,075	1,690	1,441	1,617	2,001	1,741	2,390	2,640	2,589	3,944	
Cryptosporidiosis	273	233	3,342	419	359	504	302	412	416	740	
Escherichia Coli, Shiga Toxin-Producing	210	210	332	247	351	486	499	606	612	610	
Cyclosporiasis	1	2	6	10	9	14	44	351	200	316	
Amebiasis	204	434	336	244	200	112	148	183	189	206	

Five-year trends

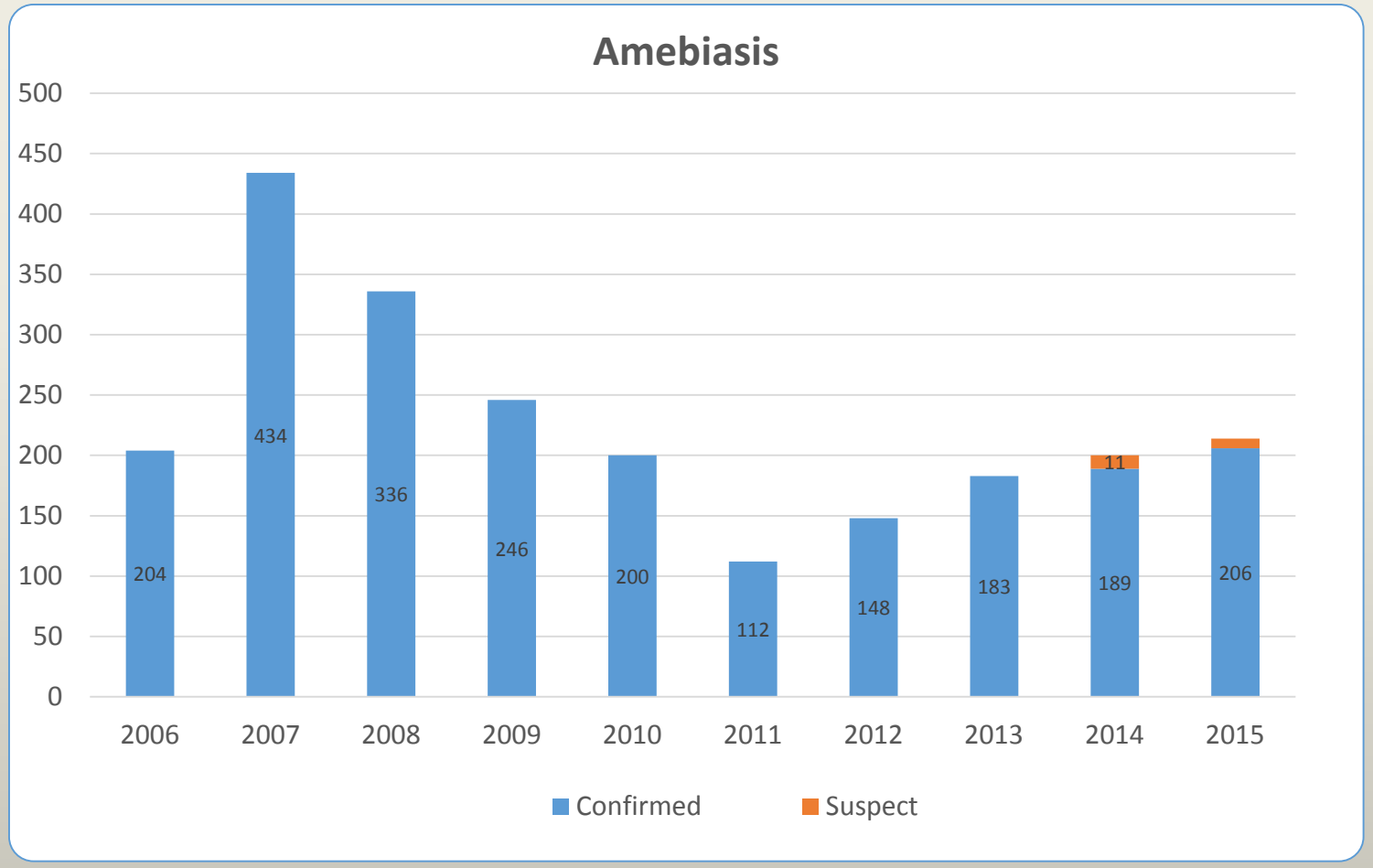
Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	5-Yr Trend Lines
Cryptosporidiosis	273	233	3,342	419	359	504	302	412	416	740	
Amebiasis	204	434	336	244	200	112	148	183	189	206	

Suspect Status Tracking – FB/WB

Condition	Definition	2013	2014	2015	2016
Amebiasis	A clinically compatible case with *E. histolytica* detected in stool by use of an antigen-based fecal immunoassay	Y	Y	Y	Y
Campylobacteriosis	A case with *Campylobacter* spp. detected, in a clinical specimen, by use of culture independent laboratory methods (non-culture based).	Y	Y		
Salmonellosis	A case with *Salmonella* sp. detected, in a clinical specimen, by use of culture independent laboratory methods (non-culture based)		Y	Y	Y
Shigellosis	A case with *Shigella* detected, in a clinical specimen, by use of culture independent laboratory methods (non-culture based)		Y	Y	Y

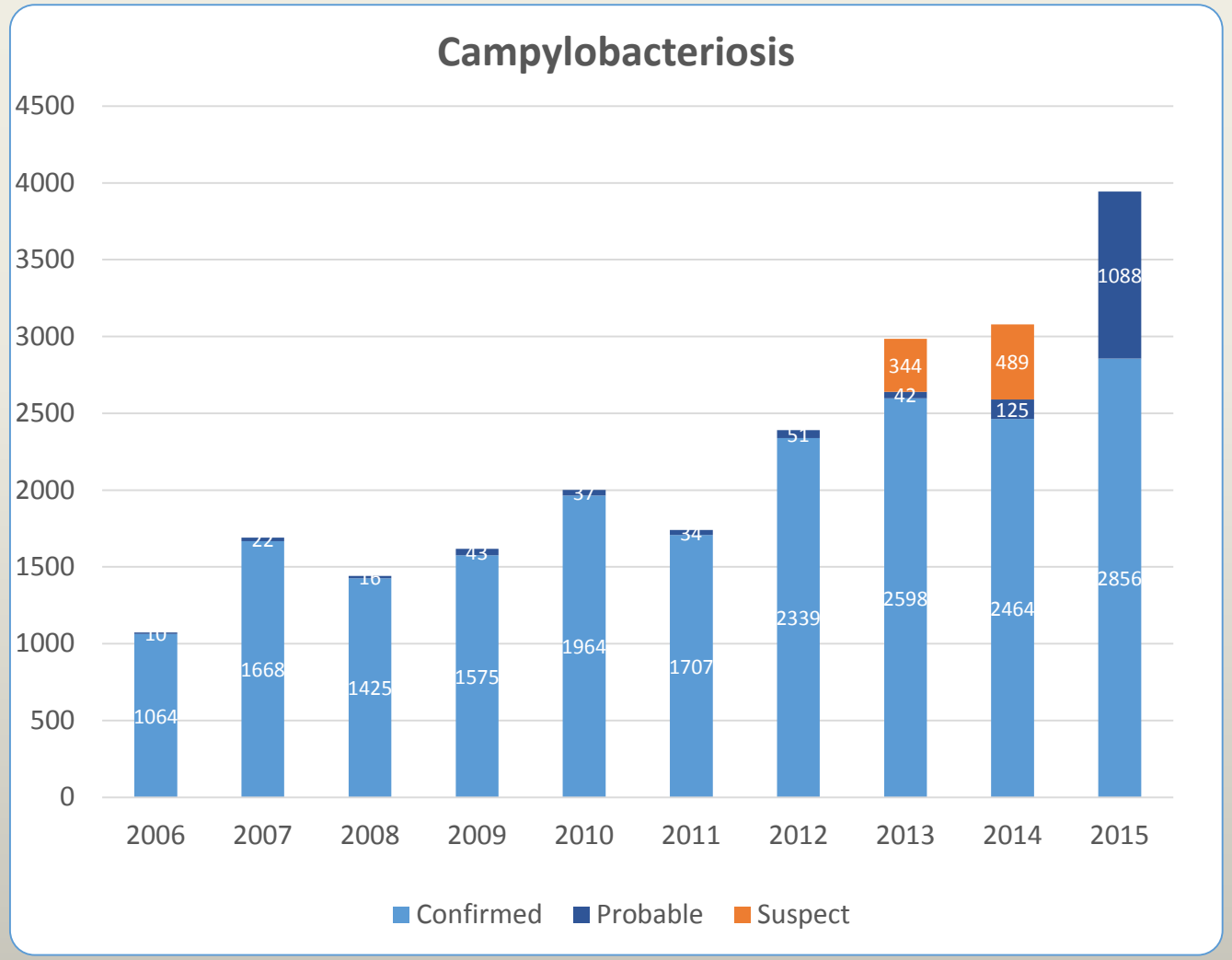
Amebiasis

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line	5-Yr Trend Line
204	434	336	244	200	112	148	183	189	206		



Campylobacteriosis

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
1,075	1,690	1,441	1,617	2,001	1,741	2,390	2,640	2,589	3,944	



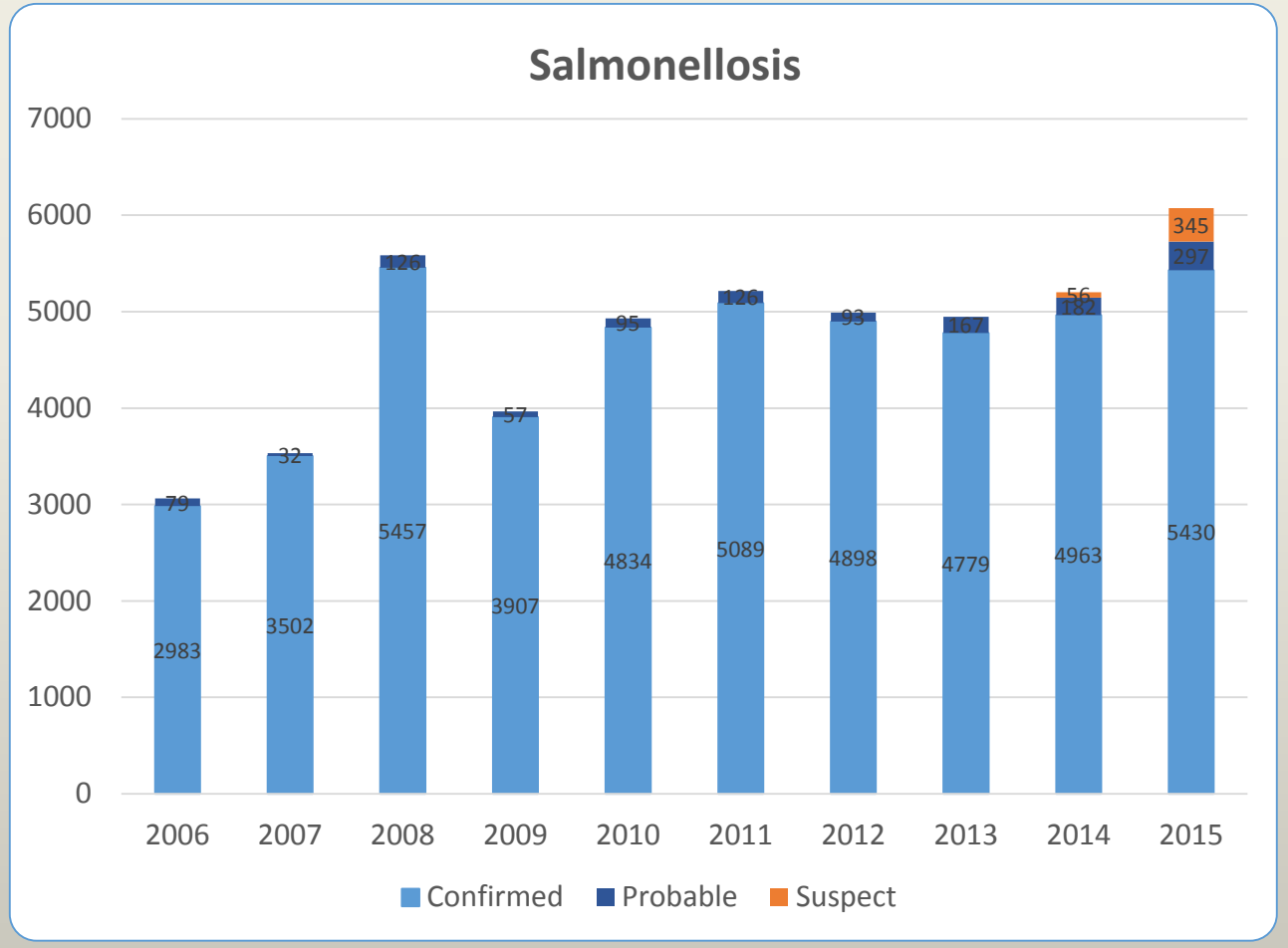
In 2015, the antigen positives were incorporated into the probable case definition nationally and in Texas.

That year, of the 1,088 probable cases, only 48 are coded as epi-linked as the confirmation method which is on par with most previous years.

So, the ongoing increase in confirmed cases has been augmented by probable cases base on antigen testing.

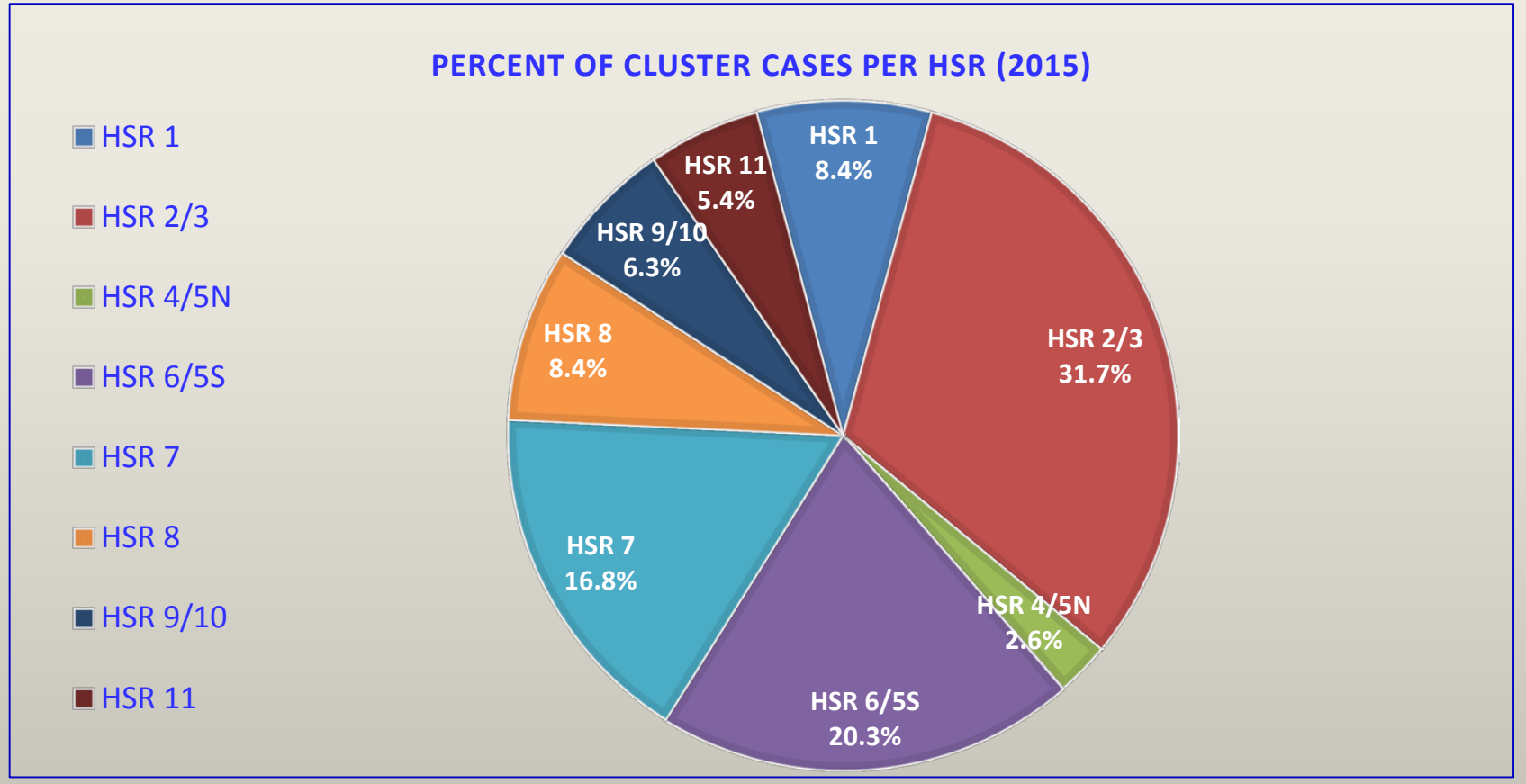
Salmonellosis

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
3,060	3,534	5,583	3,964	4,929	5,218	4,990	4,946	5,145	5,727	



Salmonella Cluster Investigations, Texas 2015

2015 *Salmonella* Clusters	HSR 1	HSR 2/3	HSR 4/5N	HSR 6/5S	HSR 7	HSR 8	HSR 9/10	HSR 11	Texas
Number	39	147	12	94	78	39	29	25	463
Percent	8.4%	31.8%	2.6%	20.3%	16.8%	8.4%	6.3%	5.4%	100%

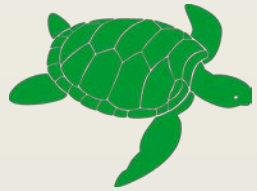


Acknowledgement:
Gregg Leos, Foodborne Epidemiologist, EAIDB

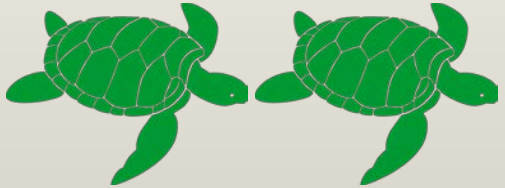
Salmonella Cluster Sources Identified

- **Poona → Cucumbers**
  - 905 cases in 40 states (48 in TX)

- **Poona → Turtles**
  - 8 TX cases in 2015
  - On going (other serotypes added), currently 178 cases in 32 states (26 in TX)



- **Sandiego (2 clusters, 2 different PFGE patterns)→ Turtles (again)**
  - 17 cases in 9 states (2 in TX)
  - 21 cases in 7 states (2 in TX)



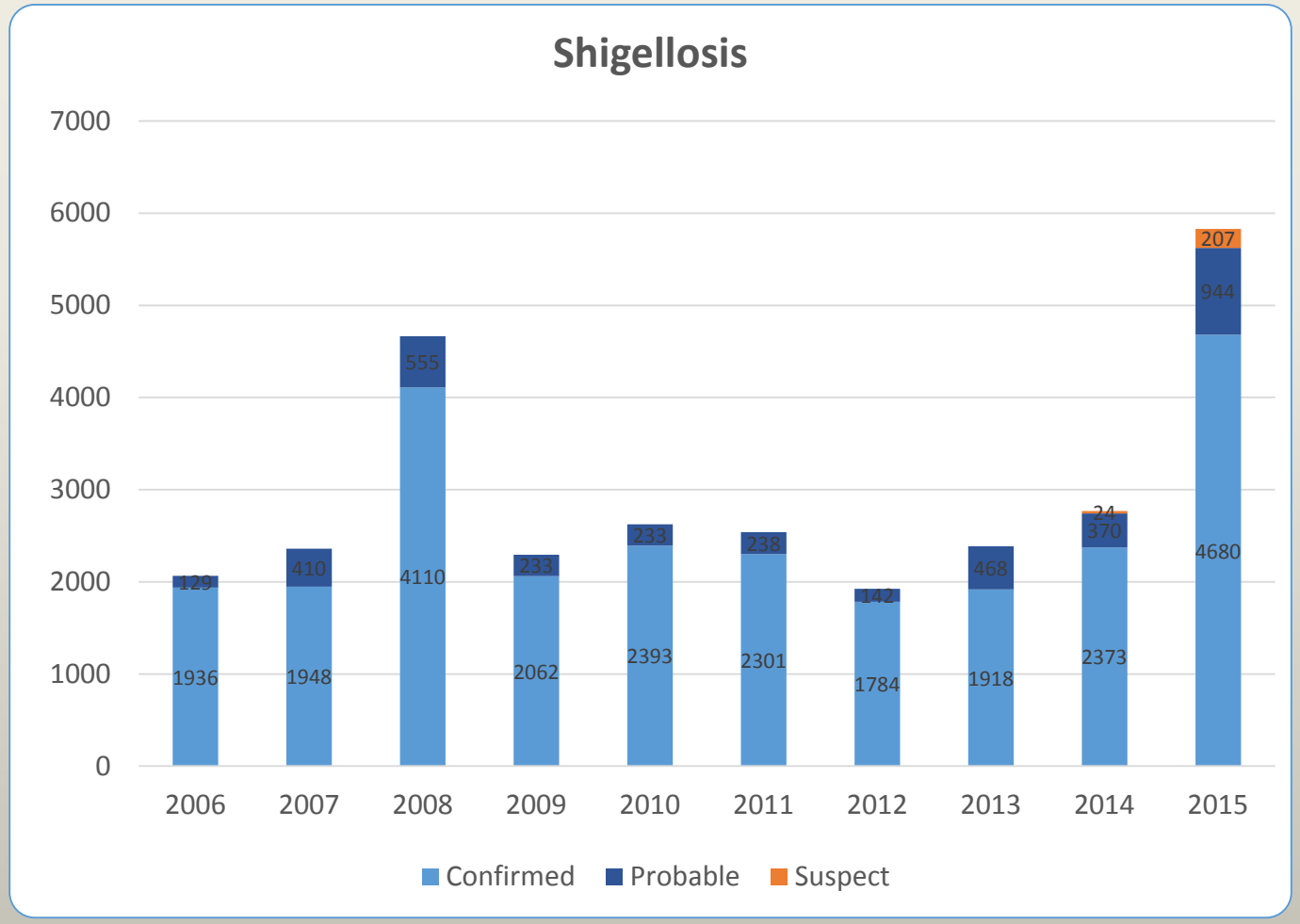
- **Virchow → Powdered Supplement**
  - 35 cases in 23 states (2 in TX)

- **Braenderup → Restaurant**
  - 13 cases in 4 states (10 in TX)

Acknowledgement:
Gregg Leos, Foodborne Epidemiologist, EAIDB

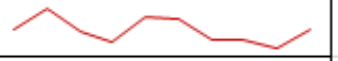
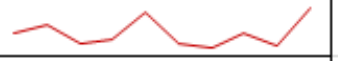
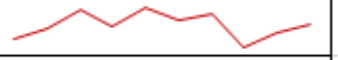
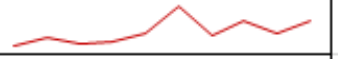
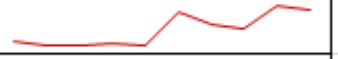
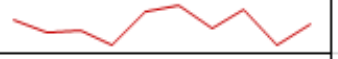
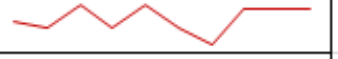
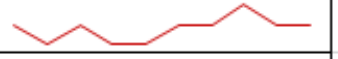
Shigellosis

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
3,060	3,534	5,583	3,964	4,929	5,218	4,990	4,946	5,145	5,727	



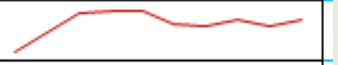
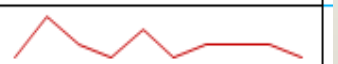
Food and Water Borne: <100 Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Lines
Vibrio, Other/Unspecified	21	19	28	36	30	33	35	40	44	45	
Listeriosis	41	64	37	27	53	51	28	28	19	41	
Vibrio Vulnificus	22	26	17	19	32	17	15	22	16	35	
Typhoid Fever	17	22	31	23	32	26	29	13	20	24	
Vibrio Parahaemolyticus	11	15	12	13	17	29	16	22	17	22	
Hepatitis E, Acute	2	0	0	1	0	14	9	7	17	15	
Hemolytic Uremic Syndrome	16	11	12	6	19	22	13	20	6	14	
Botulism, Infant	5	4	8	4	8	4	1	7	7	7	
Botulism, Wound	1	0	1	0	0	1	1	2	1	1	
Botulism, Other	0	0	1	0	0	0	0	0	0	1	
Botulism, Foodborne	0	3	0	0	0	0	0	4	0	0	
Cholera	0	1	1	2	2	1	1	0	0	0	

Invasive/Respiratory Cases in 2015

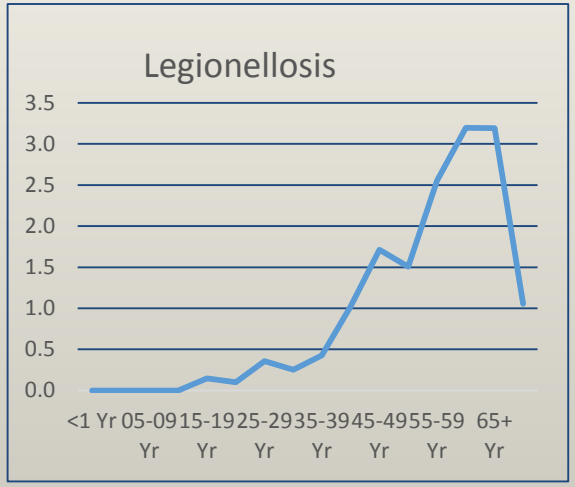
Ten-year trends

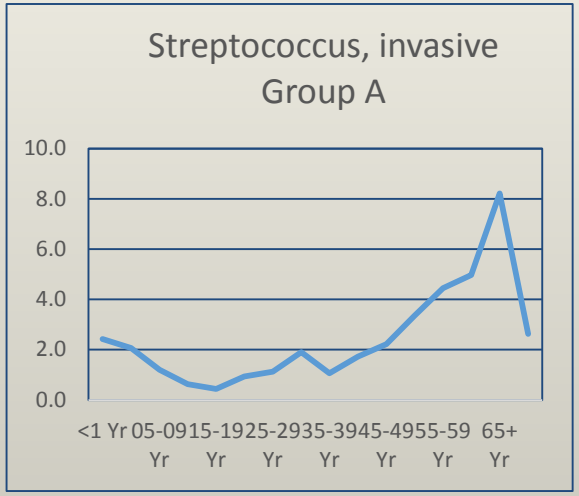
Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Streptococcus, Group B	464	433	583	658	825	903	1,020	1,050	1,356	1,703	
Streptococcus Pneumoniae	901	1,417	1,886	1,952	1,912	1,603	1,535	1,715	1,562	1,693	
Streptococcus, Group A	302	281	426	326	355	427	333	419	601	729	
Legionellosis	69	121	81	115	136	111	158	168	256	292	
Influenza-Associated Pediatric Mortality	NR	13	9	54	7	11	12	17	23	12	
Amebic CNS	0	3	1	0	2	0	1	1	1	3*	
Influenza, Novel A	NR	0	1	1+	0	0	0	0	0	0	
Novel Coronavirus	0	0	0	0	0	0	0	0	0	0	

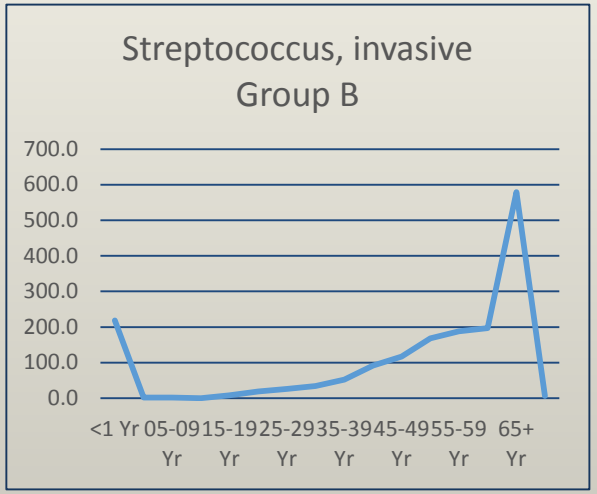
*Includes 2 cases of Primary Amebic Meningoencephalitis (PAM) in males ages 4 and 14 infected with *Naegleria fowleri* in July and August and 1 case of Other Amebic Meningitis with onset in May in a 77 year-old diabetic male infected with *Balamuthia mandrillaris.*

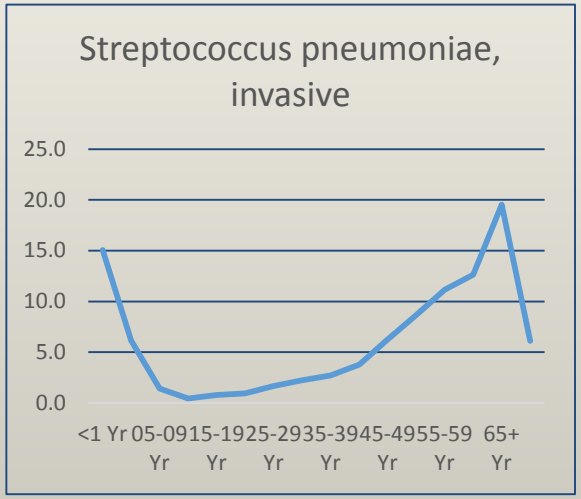
Incidence Rates for Top Invasive/Respiratory Conditions, Texas 2015

Condition	<1	01-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Legionellosis	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.3	0.4	1.0	1.7	1.5	2.6	3.2	3.2	1.1
Streptococcus, invasive Group A	2.4	2.1	1.2	0.6	0.4	0.9	1.1	1.9	1.1	1.7	2.2	3.4	4.5	5.0	8.2	2.6
Streptococcus, invasive Group B	219.0	2.0	2.0	0.0	8.0	19.0	26.0	34.0	52.0	92.0	117.0	168.0	188.0	197.0	579.0	6.1
Streptococcus pneumoniae, invasive	15.1	6.1	1.4	0.4	0.8	0.9	1.7	2.3	2.7	3.8	6.3	8.7	11.2	12.6	19.5	6.1

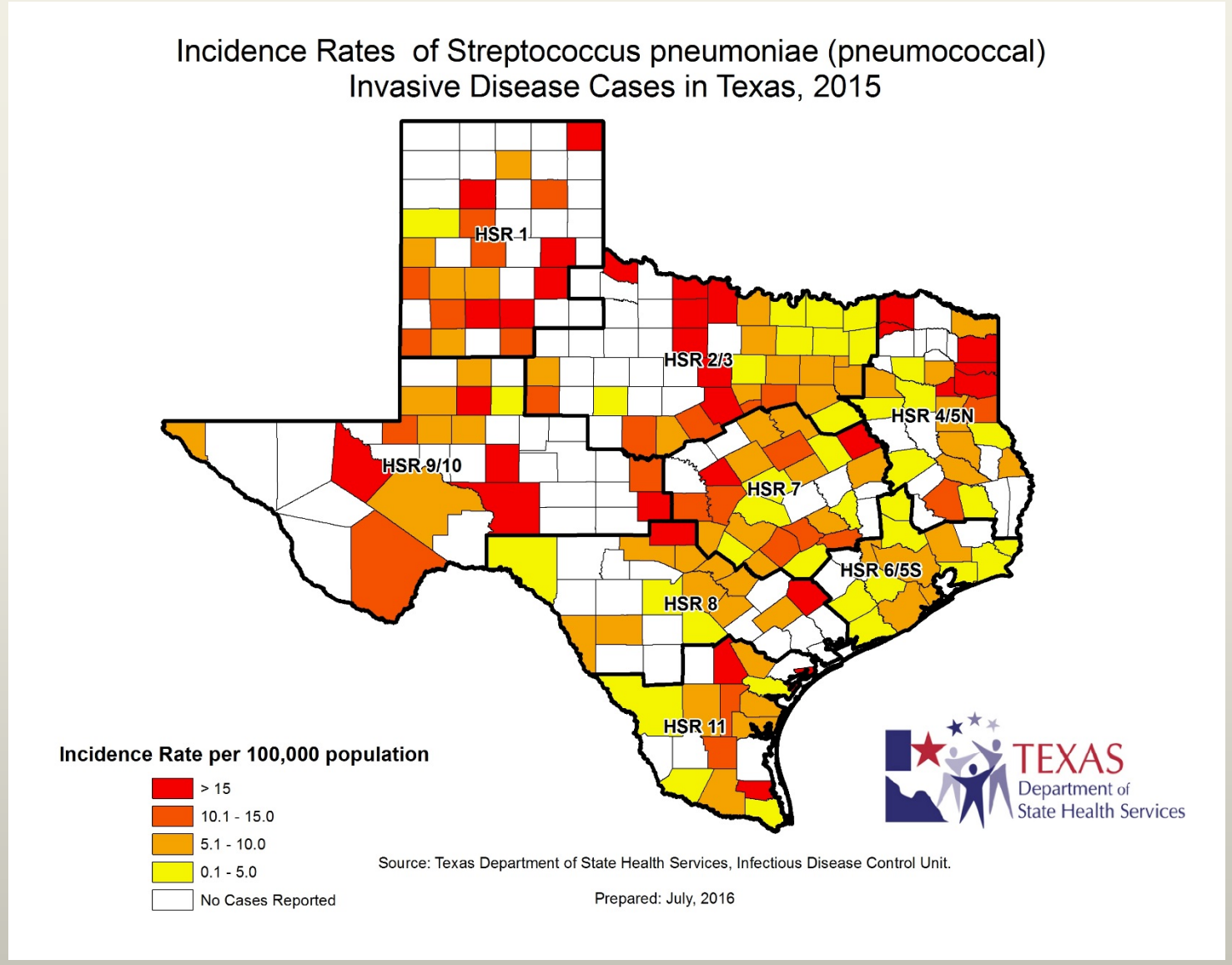




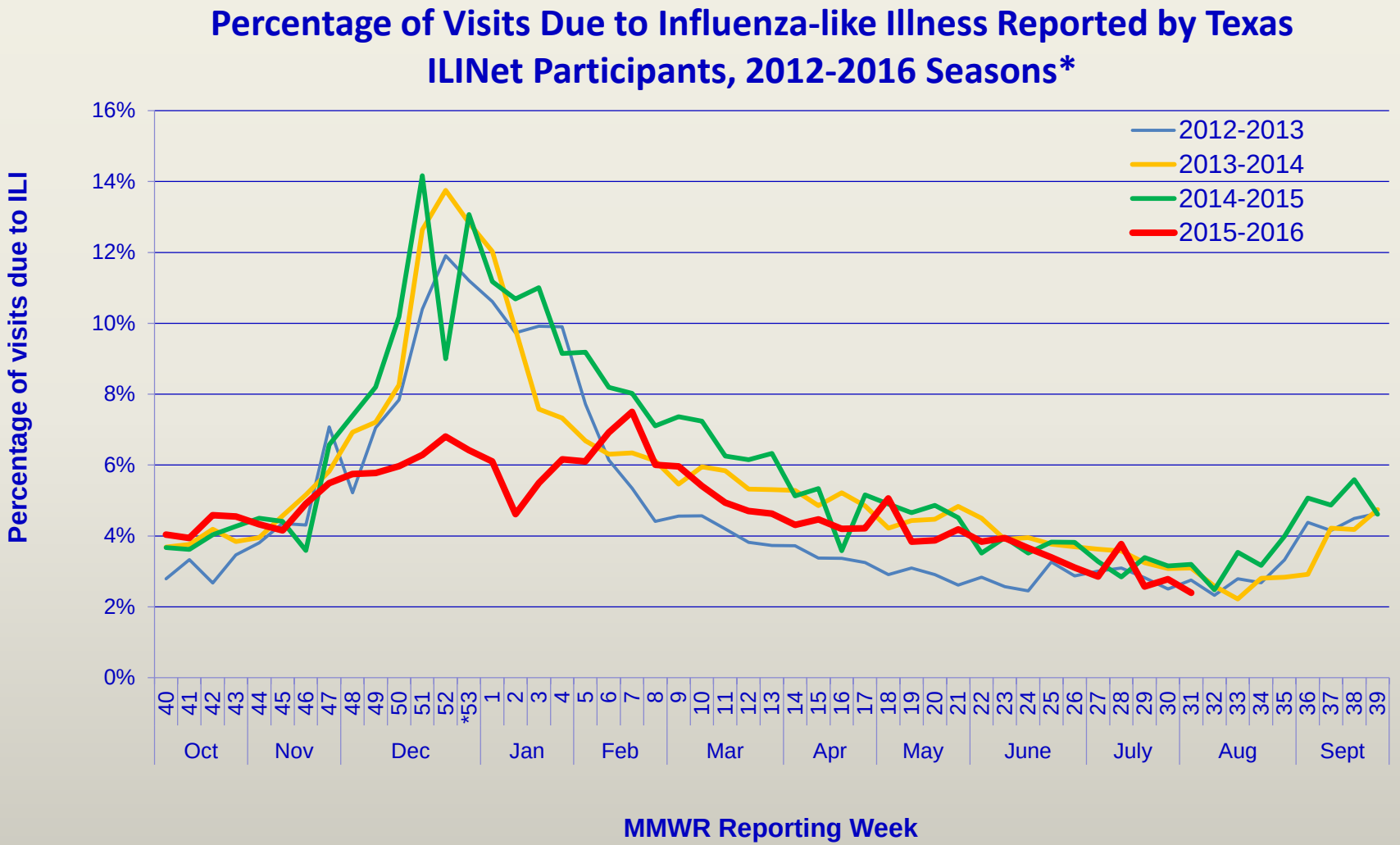




Streptococcus Geographic Distribution



ILI Activity

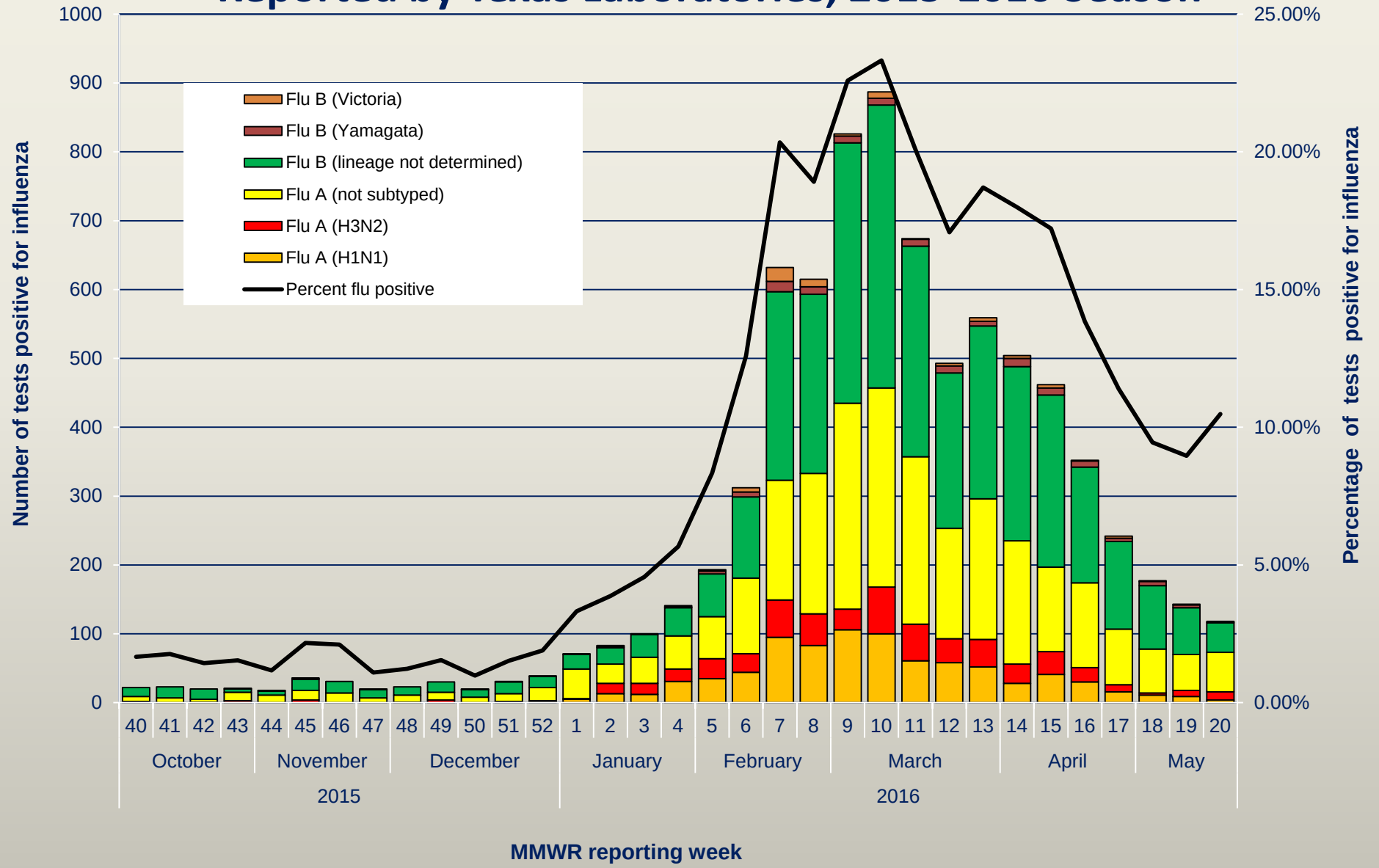


According to laboratory data, in the 2015-2016 season, flu peaked in March in Texas, later than the 3 previous seasons

*There was no week 53 in the previous influenza seasons displayed above; the week 53 data for these seasons is an average of weeks 52 and 01.

Acknowledgments: Johnathan Ledbetter, State Influenza Surveillance Coordinator

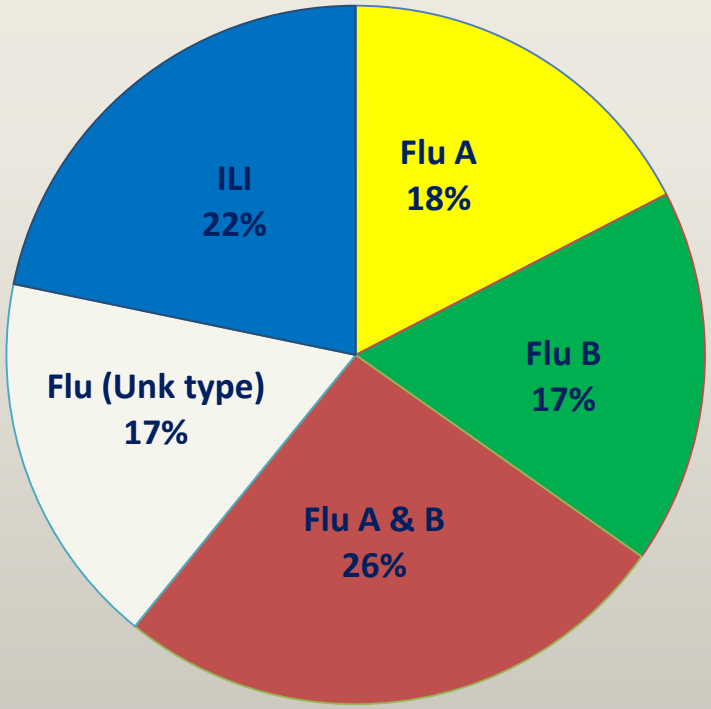
Number and Percentage of Tests (Antigen, Culture, PCR) Positive for Influenza by Type, Subtype, and Lineage Reported by Texas Laboratories, 2015-2016 Season



ILI/Flu-associated Outbreaks*

- The number of reported outbreaks in Texas decreased by 58.2% when compared to the last flu season
  - 23 in 2015-16 season
    vs 55 in 2014-15 season
- Over 65% of the outbreaks were reported in schools

Number of Reported ILI/Influenza-Associated Outbreaks in Texas by Influenza Type, 2015-2016 Season



*As of Aug. 11, 2016

2015–16 Influenza-associated Pediatric Mortality

- 7 influenza-associated pediatric deaths*
  - More than half of the children were positive for influenza A
  - 3 (~43%) children had no underlying health conditions
    - 2014-15 season: 9 out of 19 (~47%) had no underlying health conditions
  - 33.3% of the children with a known vaccination status were vaccinated for influenza

*As of Aug. 11, 2016

2015-2016 Influenza-Associated Pediatric Mortality

- 7 influenza-associated pediatric deaths*
  - More than half of the children were positive for influenza A
  - 3 (~43%) children had no underlying health conditions
    - 2014-15 season: 9 out of 19 (~47%) had no underlying health conditions
  - 33.3% of the children with a known vaccination status were vaccinated for influenza

Pneumonia & Influenza (P&I) Mortality Data*

Table 7: Texas P&I Deaths Occurring Oct. 04, 2015-Aug. 10, 2016* by Age

Age Category (years)	Number of P&I Deaths+	Mortality Rate (per 100,000)
0 - 4	32	1.57
5 - 17	17	0.32
18 - 49	419	3.35
50 - 64	1167	23.48
65 +	5348	158.92
Overall	6983	24.73

*NOTE: Data are provisional and subject to change, errors, and duplicates

+ If the cell count is less than 10, the number of P&I deaths is suppressed and <10 is written in the cell.

Overall mortality rate for pneumonia and influenza during the 2015-2016 season was 25.7/100,000 and by Region ranged from 21.2 to 34.6

Texas P&I Deaths Ocurring Oct 4th- August 10th by Region

HSR	Number of P&I Deaths
1	311
2/3	1968
4/5N	540
6/5S	1559
7	814
8	716
9/10	414
11	661
Overall	6983

*As of Aug. 11, 2016

Miscellaneous Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Hepatitis C, Acute	56	67	59	36	35	37	44	28	47	48	
Creutzfeldt-Jakob Disease	11	14	19	21	28	18	21	14	26	18	
Viral Hemorrhagic Fever	0	0	0	0	0	0	0	0	3	0	

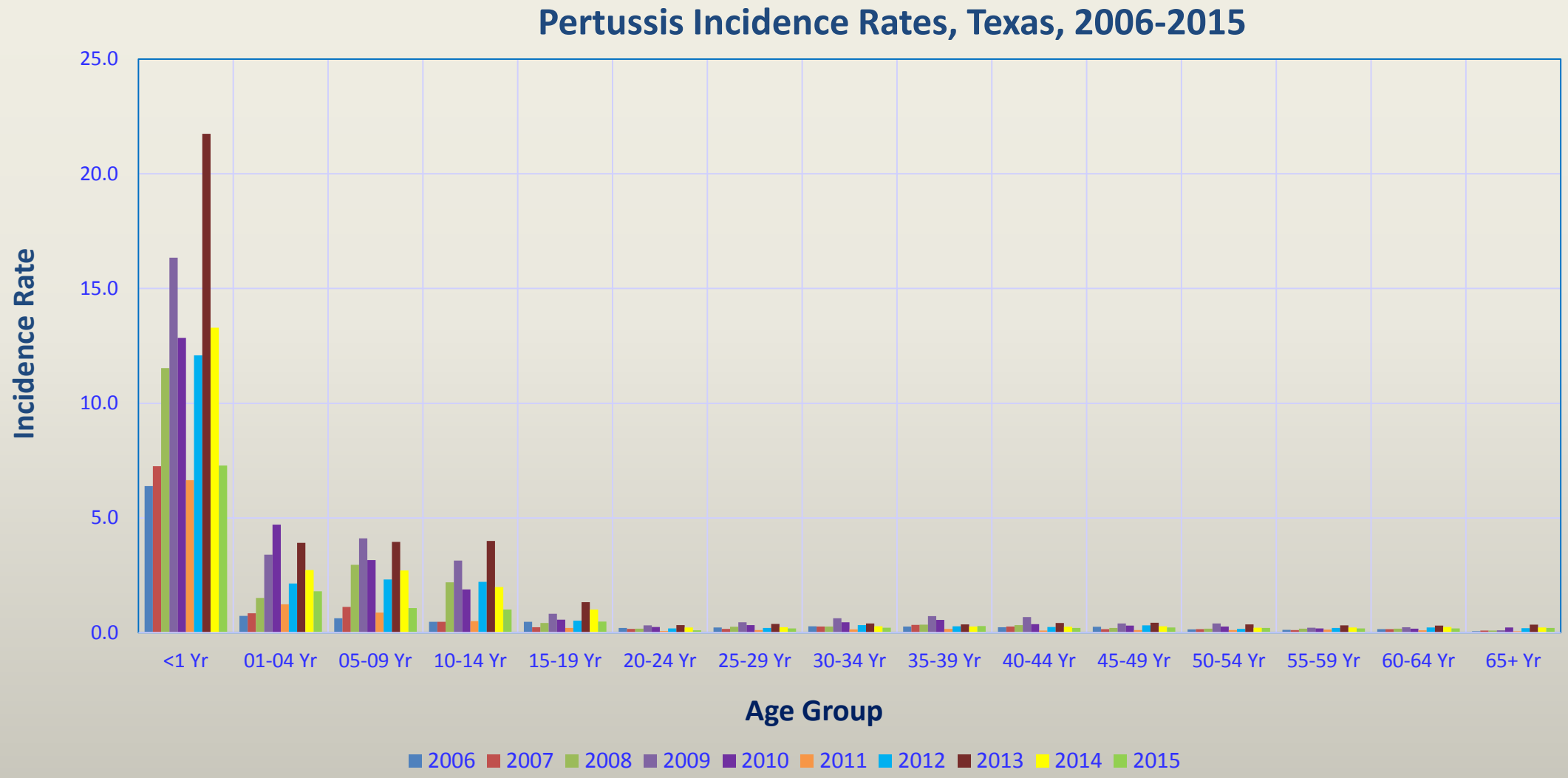
Vaccine Preventable: >100 Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Pertussis	954	1,051	2,046	3,358	2,848	961	2,218	3,985	2,576	1,504	
Chickenpox (Varicella)	11,768	10,061	7,839	4,445	2,760	2,558	2,410	1,874	1,647	1,491	
Hepatitis B, Acute	833	741	562	420	394	204	170	142	122	159	
Hepatitis A, Acute	330	264	259	184	139	138	134	109	123	147	

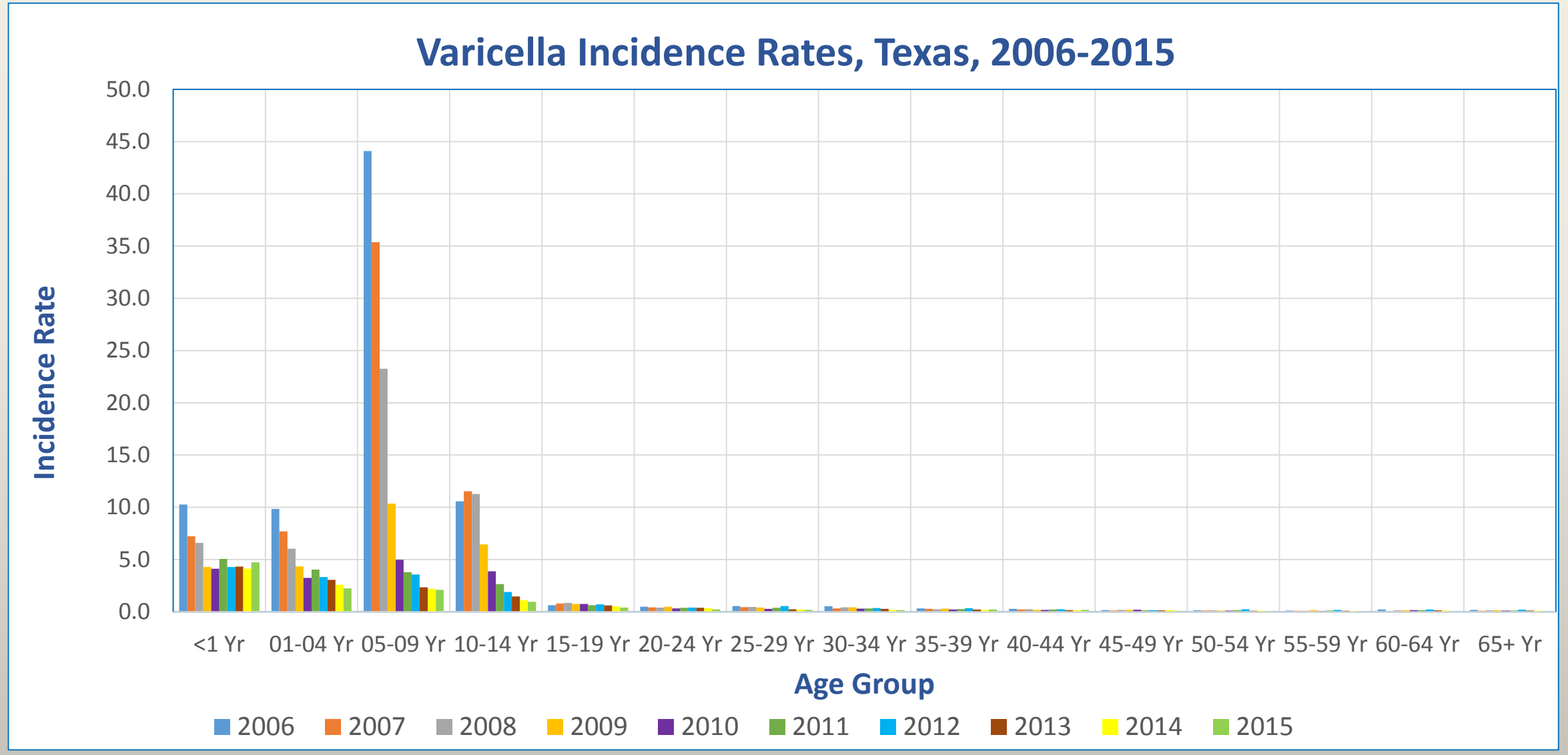
Pertussis -

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Pertussis	954	1,051	2,046	3,358	2,848	961	2,218	3,985	2,576	1,504	



Varicella -

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
11,768	10,061	7,839	4,445	2,760	2,558	2,410	1,874	1,647	1,491	



Descriptive Statistics* – Texas Varicella Case Ages 2006-2015

Mean trending up 2004-2014 then dropping; Median holding at 7-8; Mode dropped from 6-9 to 1 in 2011 and <1 in 2015

2006	
Mean	8.22
Standard Error	0.07
Median	7
Mode	6
Standard Deviation	7.60
Sample Variance	57.74
Kurtosis	31.52
Skewness	4.84
Range	91
Count	11678

2007	
Mean	8.40
Standard Error	0.07
Median	8
Mode	7
Standard Deviation	6.81
Sample Variance	46.43
Kurtosis	31.26
Skewness	4.62
Range	89
Count	10025

2008	
Mean	9.25
Standard Error	0.09
Median	8
Mode	8
Standard Deviation	8.39
Sample Variance	70.43
Kurtosis	23.86
Skewness	4.18
Range	93
Count	7815

2009	
Mean	10.70
Standard Error	0.17
Median	8
Mode	8
Standard Deviation	11.04
Sample Variance	121.88
Kurtosis	13.60
Skewness	3.27
Range	97
Count	4431

2010	
Mean	11.54
Standard Error	0.25
Median	8
Mode	9
Standard Deviation	12.96
Sample Variance	168.08
Kurtosis	8.17
Skewness	2.66
Range	86
Count	2755

2011	
Mean	11.58
Standard Error	0.28
Median	8
Mode	1
Standard Deviation	14.12
Sample Variance	199.45
Kurtosis	6.16
Skewness	2.36
Range	96
Count	2558

2012	
Mean	14.05
Standard Error	0.34
Median	8
Mode	1
Standard Deviation	16.66
Sample Variance	277.62
Kurtosis	3.54
Skewness	1.93
Range	92
Count	2410

2013	
Mean	12.32
Standard Error	0.35
Median	7
Mode	1
Standard Deviation	15.05
Sample Variance	226.45
Kurtosis	3.96
Skewness	2.02
Range	84
Count	1873

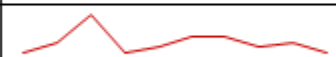
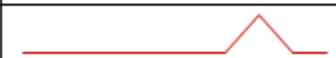
2014	
Mean	12.22
Standard Error	0.38
Median	7
Mode	1
Standard Deviation	15.44
Sample Variance	238.29
Kurtosis	4.65
Skewness	2.12
Range	92
Count	1647

2015	
Mean	10.86
Standard Error	0.34
Median	7
Mode	0
Standard Deviation	13.32
Sample Variance	177.44
Kurtosis	5.28
Skewness	2.16
Range	92
Count	1491

*Add Analysis ToolPak in Excel/File/Options/Add-Ins/Analysis ToolPak. Highlight column with ages of each case for each year; Select Data/Data Analysis/Descriptive statistics

Vaccine Preventable: <100 Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Meningococcal Infection	45	55	70	53	59	30	37	30	22	30	
Mumps	58	21	20	40	121	68	15	13	15	20	
Haemophilus Influenzae Type B, Invasive	11	14	11	7	12	2	3	5	12	11	
Tetanus	1	0	3	1	0	2	3	2	4	2*	
Rubella	0	0	0	0	0	0	0	0	0	2**	
Measles	0	7	0	1	0	6	0	27	10	1***	
Hepatitis B, Perinatal	1	3	8	1	2	4	4	2	3	1	
Poliomyelitis	0	0	0	0	0	0	0	1	0	0	

*Tetanus – 36-year-old male, 16 years since last vaccination, leg wound while hunting/no medical care;
57-year-old male, unknown date of last vaccination, no specific wound – plumber with minor scrapes

**Rubella – 22-year-old unvaccinated male, confirmed by RT-PCR, Rubella genotype 2B, exposure in Burundi;
21-year-old male, unknown vaccine status, confirmed by RT-PCR, Rubella genotype 2B, exposure in Viet Nam

***Measles – 28-year-old female, history 1 dose vaccine, confirmed by RT-PCR, Measles genotype D8, exposure in Mumbai, India

Zoonosis: >50 Cases in 2015

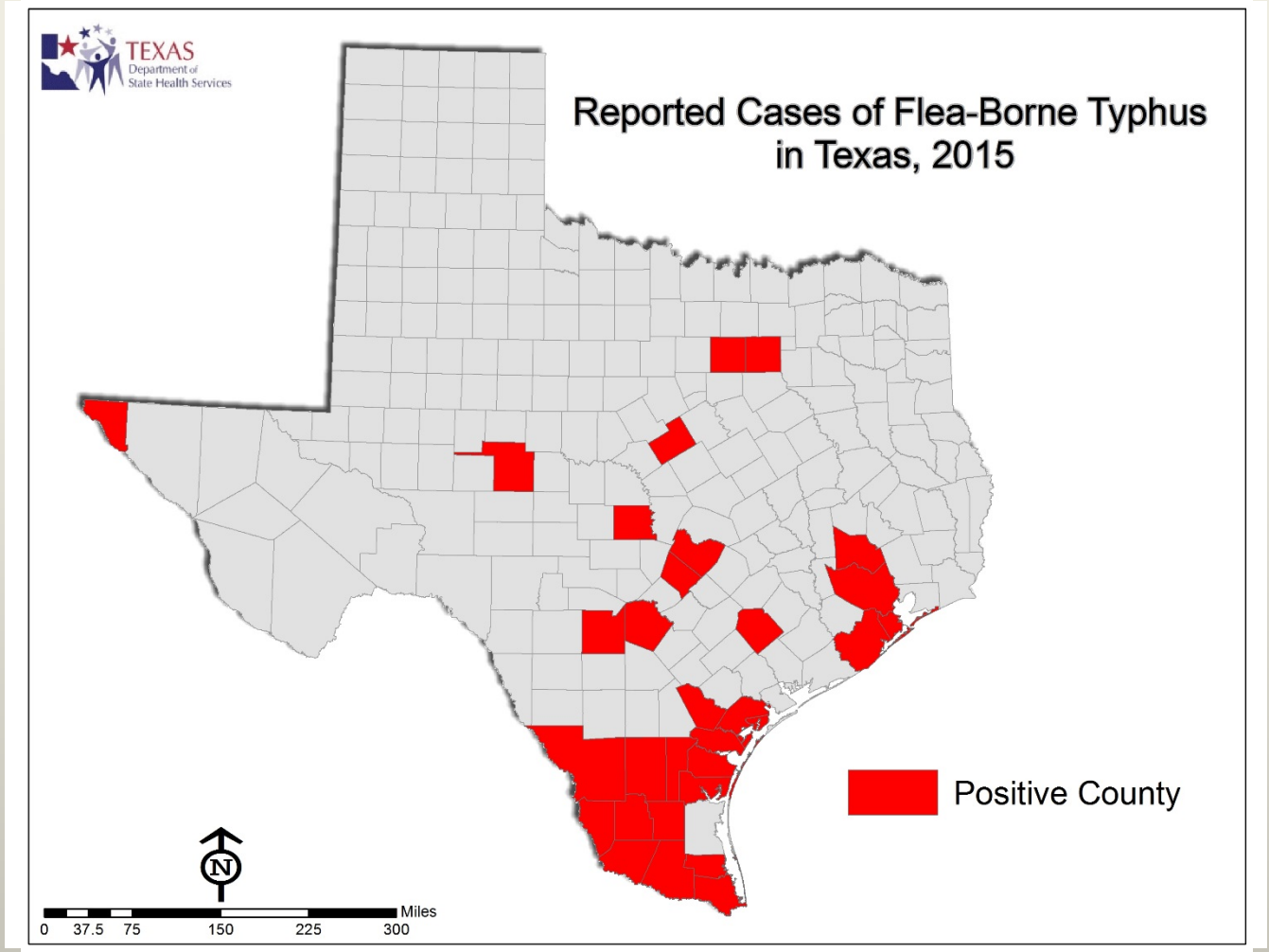
Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Typhus, Murine	146	169	157	191	135	286	263	222	308	324	
West Nile Neuroinvasive Disease	233	170	40	93	77	20	844	113	253	196	
Malaria	106	130	87	87	98	102	102	90	106	99	
West Nile Fever	121	90	24	22	12	7	1,024	70	126	79	
Spotted Fever Gp Rickettsioses	40	49	62	36	34	52	77	83	94	61	
Chikungunya	NR	NR	NR	NR	NR	NR	NR	NR	114	55	
Lyme Disease	29	87	153	276	142	74	75	82	40	54	

Murine Typhus

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Lines
Typhus, Murine	146	169	157	191	135	286	263	222	308	324	

Increasing in number/spreading geographically

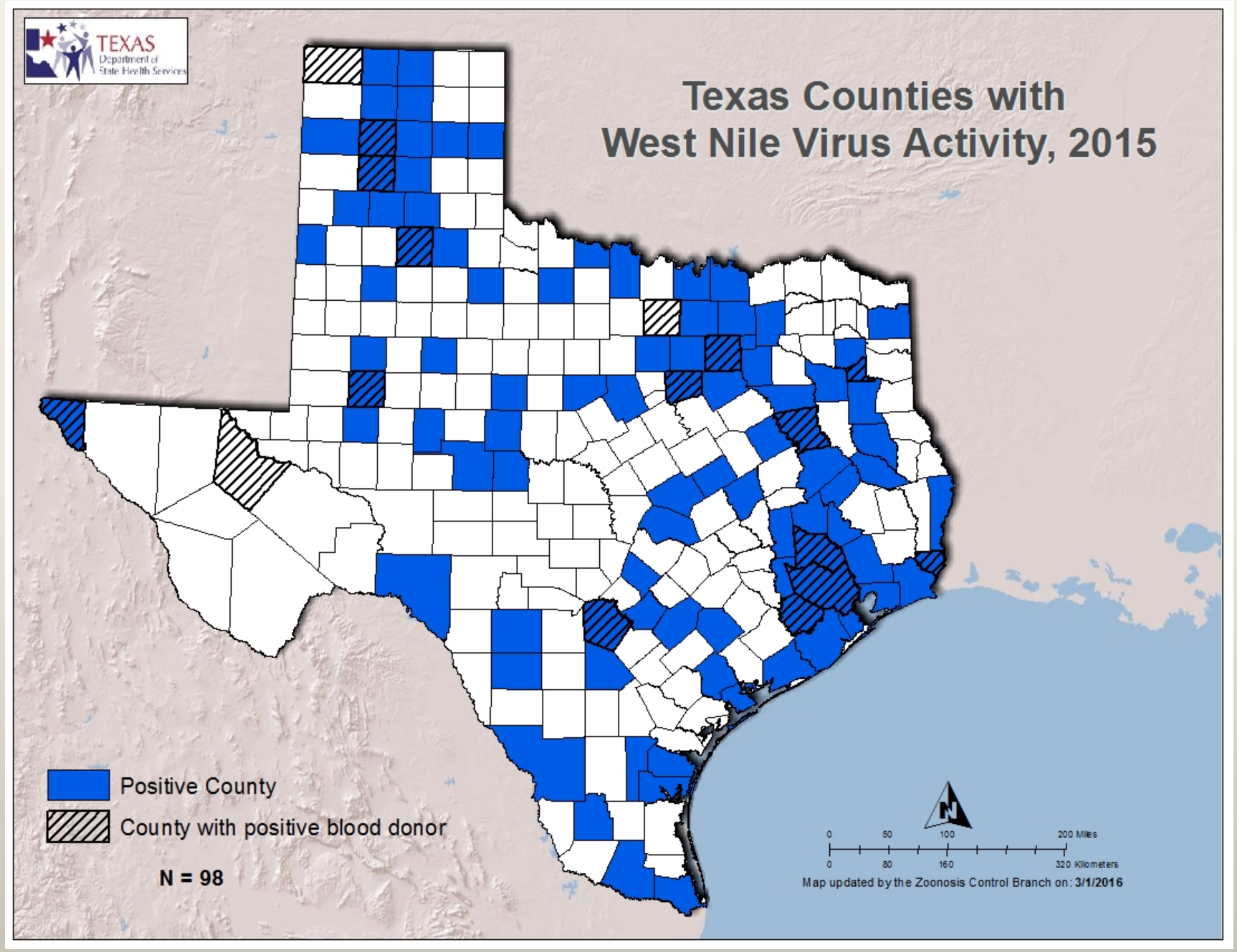


Acknowledgments:
Zoonosis Control Branch
- Nicole Evert, Pat Hunt

West Nile Virus Activity in Texas, 2006-2015

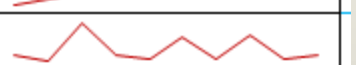
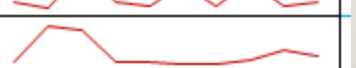
Sample Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bird	204	126	90	3	10	6	13	211	5	76	14
Human	195	354	260	64	115	89	27	1868	183	379	275
West Nile Fever	67	121	90	24	22	12	7	1024	70	126	79
West Nile Neuroinvasive Disease	128	233	170	40	93	77	20	844	113	253	196
WNND Deaths	11	32	16	1	9	6	2	83	13	6	16
Case Fatality Rate-WNND	8.6	13.7	9.4	2.5	9.7	7.8	10.0	9.8	11.5	2.4	8.2
Mosquito	1069	1315	409	116	380	305	672	1403	487	1996	1565
Veterinary	62	111	95	20	30	12	6	121	69	25	31

Acknowledgments: Nicole Evert, Epidemiologist, ZCB


TEXAS
Department of
State Health Services
Texas Counties with
West Nile Virus Activity, 2015
Positive County
County with positive blood donor
N = 98
N
0
50
100
200 Miles
0
80
160
320 Kilometers
Map updated by the Zoonosis Control Branch on: 3/1/2016

Zoonosis: 10-50 Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Yersiniosis	13	10	14	17	19	18	22	35	26	44	
Dengue	8	32	22	14	19	7	16	95	34	32	
Chagas	NR	NR	NR	NR	NR	NR	NR	19	20	25	
Brucellosis	18	25	9	12	21	11	18	11	15	23	
Cysticercosis	NR	3	5	9	6	9	10	7	16	14	
Q Fever	13	11	24	13	12	19	12	20	12	13	
Ehrlichiosis/Anaplasmosis	7	32	29	7	7	6	5	8	15	11	

Zoonosis: <10 Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Flavivirus, Unspecified	NR	NR	NR	NR	NR	NR	NR	NR	NR	8	
Zika	NR	NR	NR	NR	NR	NR	NR	NR	NR	8	
Leishmaniasis	NR	9	0	2	0	4	6	11	12	6	
Taeniasis	NR	0	0	2	1	1	1	0	1	6	
Trichinosis	0	0	0	0	0	2	1	0	2	4	
St Louis Encephalitis Virus	1	0	0	4	3	0	3	1	4	0	
Hantavirus Pulmonary Syndrome	2	0	0	0	1	0	0	1	5	2	
Babesiosis	NR	NR	NR	NR	NR	NR	NR	1	1	1	
Relapsing Fever	0	0	0	0	0	0	0	0	0	1	
Tularemia	0	1	0	0	1	0	0	1	0	1	

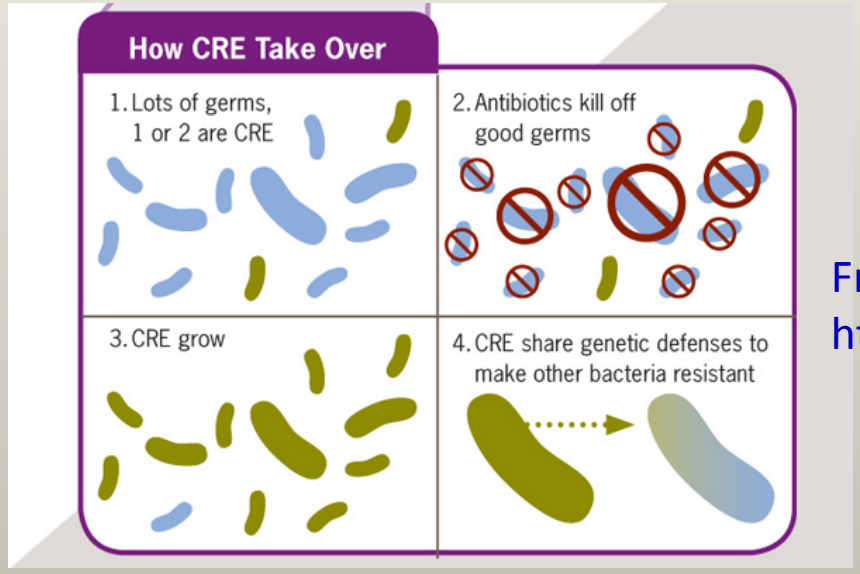
Imported Countries –
Unspecified Flavivirus (7 of 8) - Colombia (1), El Salvador (3),Guatemala (1), Mexico (1), Venezuela (1)
Leishmaniasis (2 of 6) Afghanistan and Panama
T. Solium (2 of 6) Ethiopia and Senegal
Trichinosis (1 of 4) Egypt
Zika (8 of 8) Colombia (1), El Salvador (6), Honduras (1)

MDRO Cases in 2015

Ten-year trends

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	10-Yr Trend Line
Multidrug-Resistant Acinetobacter (MDR-A)	NR	NR	NR	NR	NR	NR	NR	NR	NA*	977	
Carbapenem-Resistant Enterobacteriaceae (CRE)	NR	NR	NR	NR	NR	NR	NR	NR	NA*	874	
Vancomycin-intermediate Staphylococcus aureus (VISA)	NR	3	2	4	10	6	23	8	5	9	
Vancomycin-resistant Staphylococcus aureus (VRSA)	0	0	0	0	0	0	0	0	0	0	

*Full year's data not available. Not officially reportable until 4/3/16



From CDC Digital Press Kit
http://www.cdc.gov/media/dpk/2013/dpk-vs-hai.html

MDRO Antibiotic Resistance Data Analysis

- **Purpose:** Look at antibiotic susceptibility/resistance patterns across Texas for reported MDROs
  - Bonus: compare resistance patterns of Community Acquired infections with Healthcare Associated Infections
- **Challenges:**
  - NBS lab report output needs manipulation before it can be analyzed
  - Lab data and investigation data must be pulled separately then merged
- **Goal:** One dataset with lab information including susceptibilities matched to investigation data

Study and slides by Lauren Hoffman-Arriaga, MPH
HAI Public Health Prevention Specialist, EAIDB

NBS Reports - Source of Data

- Line List of MDRO Cases NBS Security

  Filters:

  - MMWR year = 2015 and Case Status = Confirmed or Probable

- Line List of Resulted Lab Tests (Plus)

  Filters:

  - Event date - From: 07/01/2014 To: 01/01/2016
  - Suscep Resulted Test = Not Null
  - Program Area Code = “AR/MDRO”

Data Processing Steps Part 1

1. Macro created to manipulate lab susceptibility data (parsing concatenated fields)

Resulted Test Name	Specimen Description	Suscep Interpretation	Suscep Numeric	Suscep Result Method	Suscep Resulted Test	Suscep Results	Patient Local ID
Microorganism Identified	Urine	Intermediate|Resistant ntermediate|Resistant	=16.00000|>=8.00000|= 16.00000|>=128.00000	|||	AMPICILLIN+SULBACTAM|LEVOFLOXACIN|CEFT AZIDIME|PIPERACILLIN+TAZOBACTAM	NI|NI|NI|NI	PSN485310474TX01

Excel Macro

Resulted Test Name	Specimen Description	Suscep Interpretation	Suscep Numeric	Suscep Result Method	Suscep Resulted Test	Suscep Results	Patient Local ID
Microorganism Identified	Urine	Intermediate	16		AMPICILLIN+SULBACTAM	NI	PSN485310474TX01
Microorganism Identified	Urine	Resistant	>=8.00000		LEVOFLOXACIN	NI	PSN485310474TX01
Microorganism Identified	Urine	Intermediate	16		CEFTAZIDIME	NI	PSN485310474TX01
Microorganism Identified	Urine	Resistant	>=128.00000		PIPERACILLIN+TAZOBACTAM	NI	PSN485310474TX01

2. Cleaning steps
    1. Removed any investigations with out susceptibility results (Automated)
    2. Select one investigation for labs that were associated with multiple investigations (Manual)
        - Each lab result should only be associated with one investigation
3. One to many merge of investigation database to lab results database (Access)

- Part 1 Outcome - Database with investigation data combined with lab results

Processing Steps Part 2

- Added calculated variable (NSHN def) to define cases as Healthcare Associated (HAI) or Community Acquired (CA)
  - Date of specimen collection - Hospital admission date = Delta Days
  - If Delta Days > 3 then NSHN def = HAI
  - If Delta Days ≤ 3 then NSHN def = CA
- Created Pivot tables to look at resistance patterns of antibiotics by pathogen identified
  - Filtered by NSHN def

Results

- Statewide resistance patterns among reported MDROs
- Compare Healthcare Associated infections to Community Acquired
  - Difference in Aminoglycosides class – further investigation
- Suggested use:
  - Look at statewide and regional trends over time to identify emerging resistance to antibiotics

Aminoglycosides Resistance Reported for MDROs in Texas, 2015

		AMIKACIN		GENTAMICIN		TOBRAMYCIN	
		HAI	CA	HAI	CA	HAI	CA
Acinetobacter	Resistant	78	142	140	277	109	241
	Total	144	291	205	426	203	440
	% resistant	54%	49%	68%	65%	54%	55%
Escherichia coli	Resistant	4	6	12	14	9	16
	Total	18	28	23	40	18	34
	% resistant	22%	21%	52%	35%	50%	47%
Klebsiella oxytoca	Resistant	3	2	2	3	4	2
	Total	7	6	9	8	7	7
	% resistant	43%	33%	22%	38%	57%	29%
Klebsiella pneumoniae	Resistant	50	73	71	127	98	172
	Total	122	260	166	320	146	295
	% resistant	41%	28%	43%	40%	67%	58%
Klebsiella species (unspecified)	Resistant			2	2	2	1
	Total		2	3	3	2	3
	% resistant		0%	67%	67%	100%	33%
Total	Resistant	135	223	227	423	222	432
	Total	291	587	406	797	376	779
	% resistant	46%	38%	56%	53%	59%	55%

Detecting a Problem

- EAIDB epidemiologist investigated a hunch
  - Hard copy forms received but **investigations not entered in NBS**, even after contacting LHD
  - **Older lab reports** in LHD's jurisdiction were still on **Documents Requirung Review queue**
- Looked at NBS data for IRID Team diseases (invasive streps, legionellosis, etc.)
  - Used NBS template report:
    Line List of Individual Cases with Program Area and Jurisdiction Security
    - Basic filter: {selected diseases of interest}
    - Advanced filter: County equals {county of interest} AND Case status equals confirmed or probable AND MMWR Year equals 2010, 2011, 2012, 2013, 2014, 2015, or 2016
    - Column selection: All
  - Created PivotTable in Excel – Condition vs. MMWR Year; Count of Person Local ID
  - Query results: No Streps had been entered in 2015 or 2016
    - GAS: 5-yr average: 1.4 cases per year
    - GBS: 5-yr average: 2.0 cases per year
    - *S. pneumo*: 5-yr average: 4.6 cases per year

The Investigation Continues…

- Expanded data query for all conditions (except MDRO) showed only 1 case entered (by DSHS Austin) in 2016 and very low numbers in 2015

Row Labels	2010	2011	2012	2013	2014	2015	2016	Grand Total
Shigellosis			4	1	6	16		27
Campylobacteriosis	1	11	5	2	1	5		25
Salmonellosis	17	19	23	14	13	3		89
Varicella (Chickenpox)	9	8	13	4	8	3		45
Pertussis	2		1	3	19	1		26
Legionellosis				1	1	1	1	4
Aseptic (viral) meningitis			1			1		2
Cryptosporidiosis	1				1			2
Streptococcus, invasive Group A	2	1	2	1	1			7
Strep pneumoniae, invasive	4							4
Botulism, infant					1			1
Cysticercosis			1					1
Lyme disease			1					1
Spotted Fever Rickettsiosis			1					1
West Nile Fever			1					1
Streptococcus pneumoniae, invasive disease (IPD)	5	5	3	7	3			23
Brucellosis	1							1
Streptococcus, invasive Group B	1	4	1	1	3			10
Bacterial and other meningitis			1					1
Influenza A, novel / variant	1							1
Shiga toxin-producing Escherichia coli (STEC)					1			1
Mumps	1	1						2
Grand Total	**45**	**49**	**58**	**34**	**58**	**30**	**1**	**275**

Follow up

- EAIDB epi contacted the Regional office
- Region learned that the LHD was investigating cases but was behind on data entry
- Region asked for LHD to send case report forms to Region for entry

Acknowledgments: EAIDB Epidemiologists - Lesley Brannan, Hailey Rucas, Rachel Wiseman

Editorial note: The Texas Surveillance System depends on the teamwork of all jurisdictions. Ask for/Offer/Accept help as needed

Using 2015 Pertussis Data to Make the Case for Vaccinating Pregnant Women

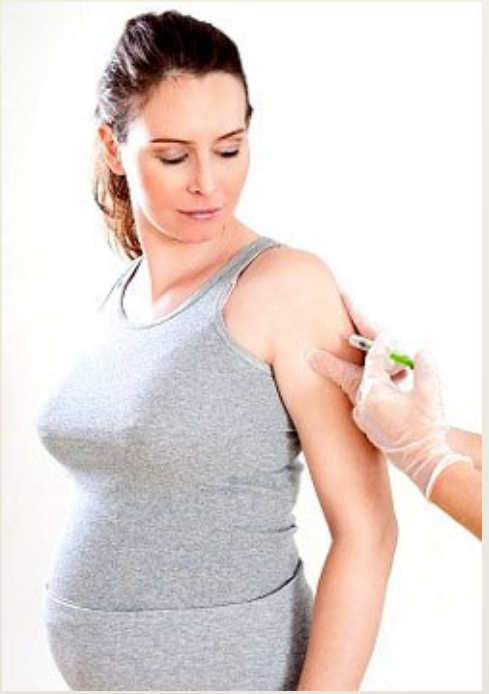
Study and slides - Rachel Wiseman, MPH
Epidemiologist, EAIDB

METHODS

- Line List of Pertussis Cases with NBS Security
- Variables to identify the target population:
  - Case status, MMWR Year, Date of Birth, Cough Onset Date (to calculate age)
- Exposure and outcome variables:
  - Hospitalization
  - Mother's vaccination history variables (re-coded)
- Miscellaneous (confounders, interaction variables)
  - Demographic variables (re-coded)
  - Patient's vaccination history variables (re-coded)
- Lots of data QA using pertussis case tracks, medical records, critical thinking, and Immtrac
- Missing data was biggest challenge

	Hospitalized (n,%)	Not hospitalized (n,%)	Relative Risk (CI)
Infant cases	81 (26.9%)	220 (73.1%)	
Age at cough onset			
<2 months	38 (48.7%)	40 (51.3%)	4.4 (2.2,8.9)
2-5 months	35 (23.3%)	115 (76.7%)	2.1 (1.0,4.4)
>5 months	8 (11.0%)	65 (89.0%)	Ref
Average age (months)	2.3	4.2	
Gender			
Female	39 (27.9%)	101 (72.1%)	1.1 (0.7,1.5)
Male	42 (26.1%)	119 (73.9%)	
Ethnicity (n=287)			
Hispanic	62 (34.8%)	116 (65.2%)	2.3 (1.4,3.9)
Non-Hispanic	16 (15.0%)	93 (85.0%)	
Maternal vaccination timing (n=221)			
Delivery	13 (21.3%)	48 (78.7%)	0.6 (0.3,1.0)
Prenatal	4 (10.3%)	35 (89.7%)	0.3 (0.1,0.7)
Not vaccinated	44 (36.4%)	77 (63.6%)	Ref
Patient vaccination status (n=298)			
Up to date	25 (17.4%)	119 (82.6%)	Ref
Not vaccinated	50 (42.0%)	69 (58.0%)	2.4 (1.6,3.7)
Under vaccinated	5 (14.3%)	30 (85.7%)	0.8 (0.3,2.0)

RESULTS



- 301 infant cases reported
  - 81 (27%) hospitalized
  - 221 (73%) had a known maternal vaccination status
    - 121 (55%) no Tdap during pregnancy or at delivery
    - 61 (38%) Tdap at delivery
    - 39 (18%) Tdap during pregnancy
- Mothers vaccinated during pregnancy, were less likely than unvaccinated mothers to have infants that required hospitalization for pertussis (RR=0.3, 95% CI: 0.1-0.7)
- Only 18% of moms in the data were vaccinated during pregnancy, meaning the best prevention is the least used.