

Texas Influenza-associated Pediatric Mortalities 2007-2009

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Objectives

The participant will be able to:

- Describe the demographics of the pediatric population most impacted by influenza-associated mortality.
- Outline antiviral usage in children who died.

Continuing Education Disclosures

- **Requirements for Successful Completion:**
 - **Complete registration form.**
 - **Sign in.**
 - **Attend entire educational activity.**
 - **Complete evaluation.**

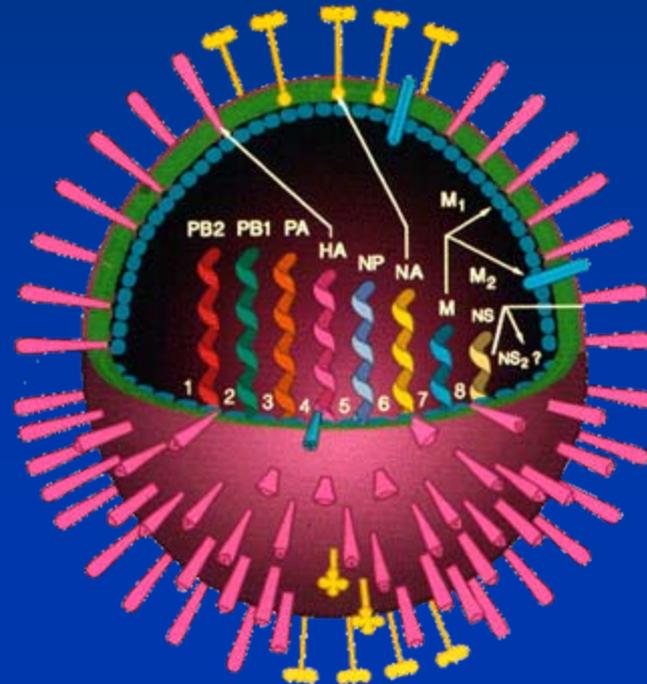
Continuing Education Disclosures

- **Commercial Support**
 - This educational activity received no commercial support.
- **Disclosure of Conflict of Interest**
 - The speakers and planning committee members have disclosed no conflict of interest.
- **Non-Endorsement Statement**
 - Accredited status does not imply endorsement by the Department of State Health Services, Continuing Education Services, Texas Medical Association, or American Nurses Credentialing Center of any commercial products displayed in conjunction with an activity.
- **Off Label Use**
 - If applicable, speakers will clearly delineate any off label use of FDA drugs or devices.

Overview

- Texas pediatric influenza death case definition
- Influenza-associated pediatric mortality data
- Antiviral usage
- Vaccinations

Influenza Virus

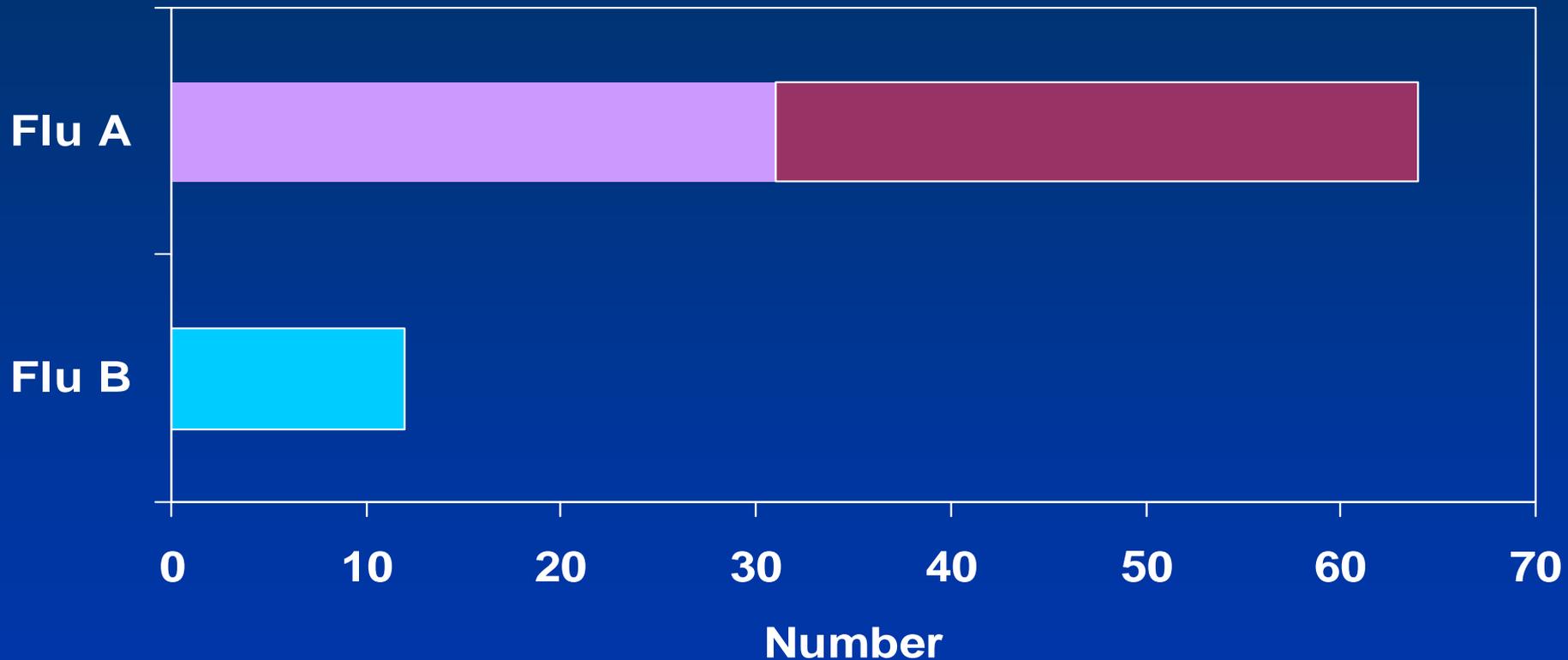


Tx Pediatric Influenza Death Case Definition

A Texas influenza-associated pediatric death is defined as:

- a death in a Texas resident
- less than 18 years of age
- following a clinically compatible illness
- lab test confirmed as influenza

Texas Pediatric Influenza Deaths by Type of Flu 2007 - 2009*



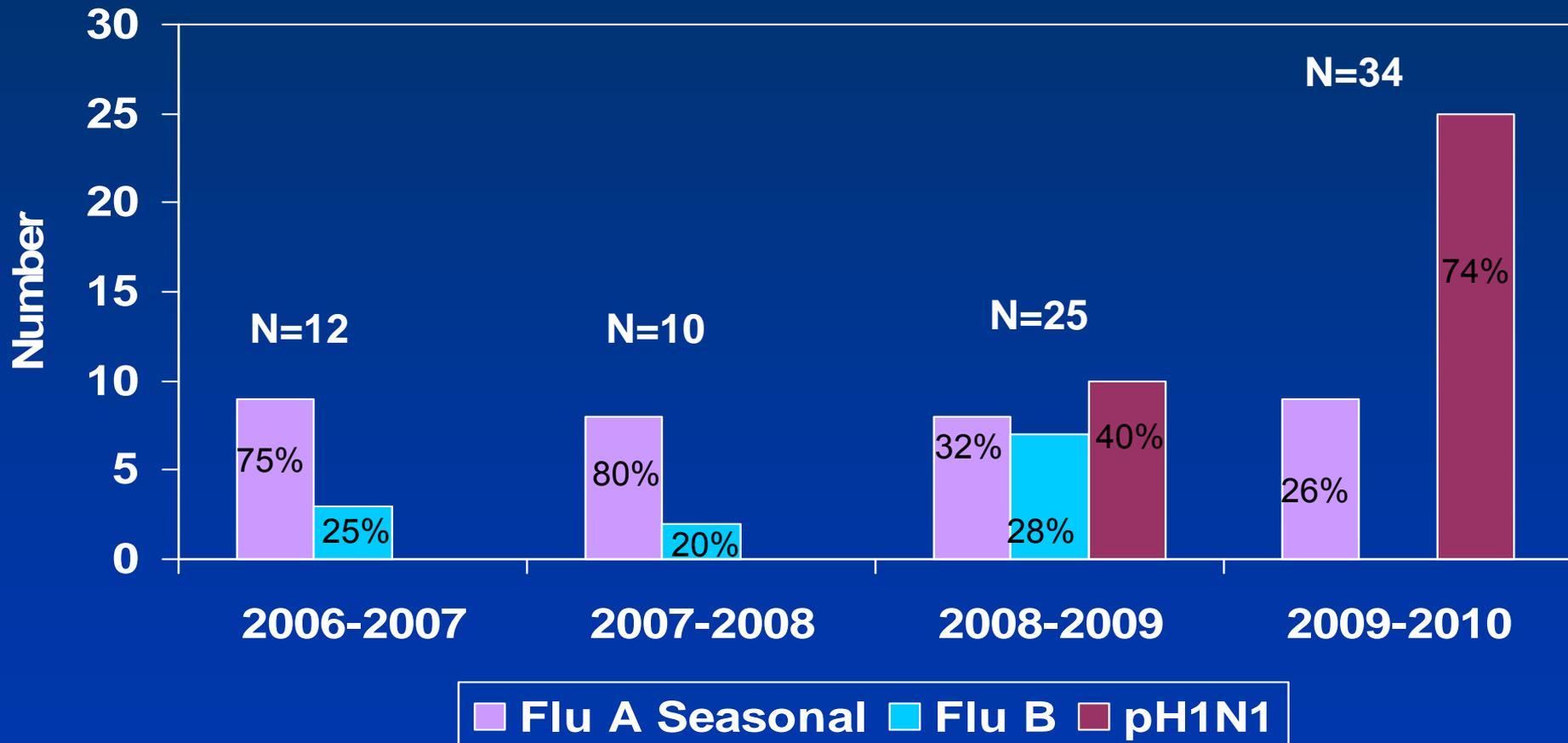
■ Seasonal and not subtyped

■ pH1N1

■ Flu B

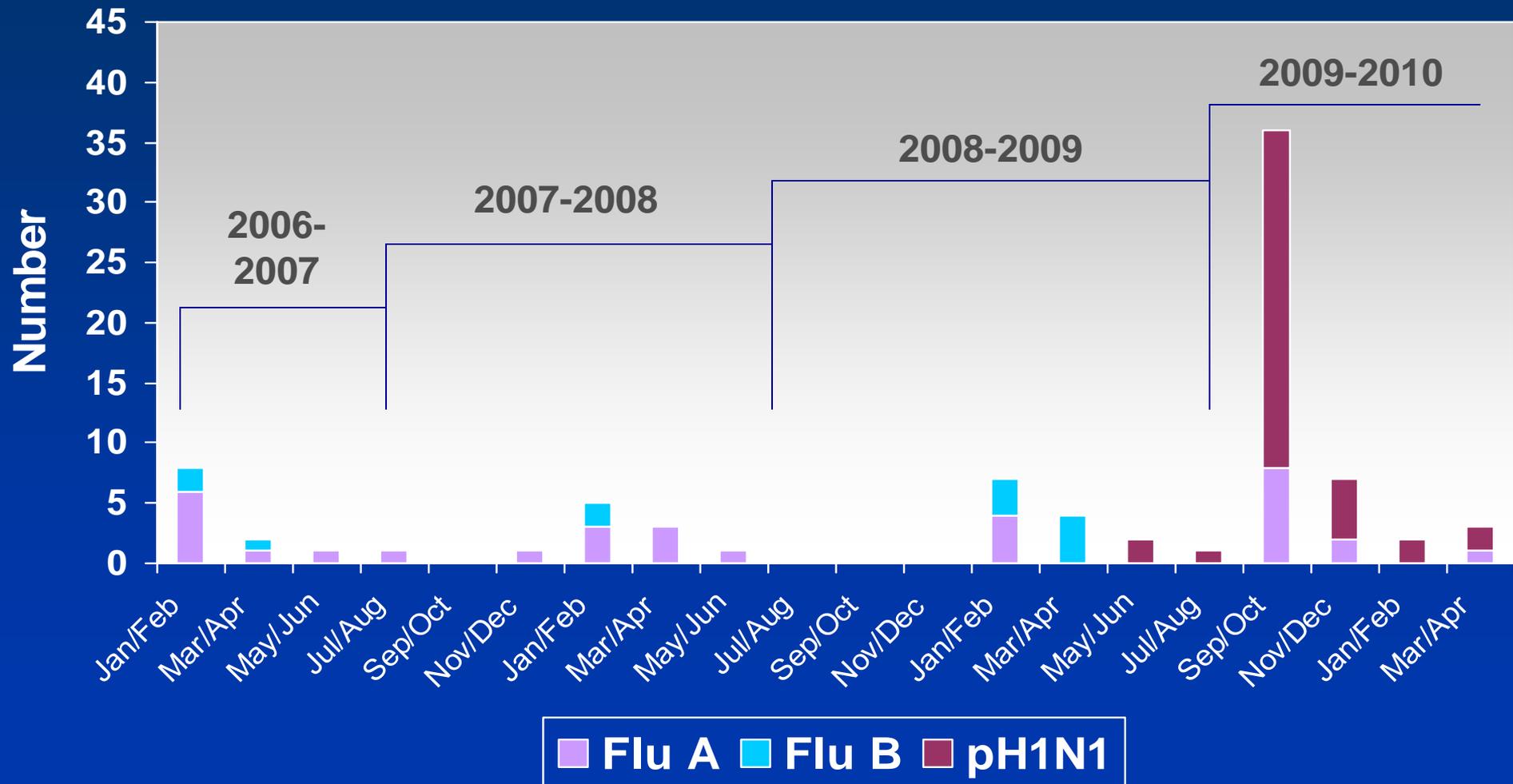
* Deaths for calendar years 2007 – 2009 (n=76) reported as of 5/18/10. Deaths by flu seasons 2006 – 2010 (n=81) reported as of 5/18/10.

Texas Pediatric Influenza Deaths by Flu Type and Flu Season*



* Seasons include cases from the following summer. Deaths (n=81) reported as of 5/18/10.

Texas Pediatric Influenza Deaths* by Flu Type 2007 - 2010



* Deaths (n=81) reported as of 5/18/10.

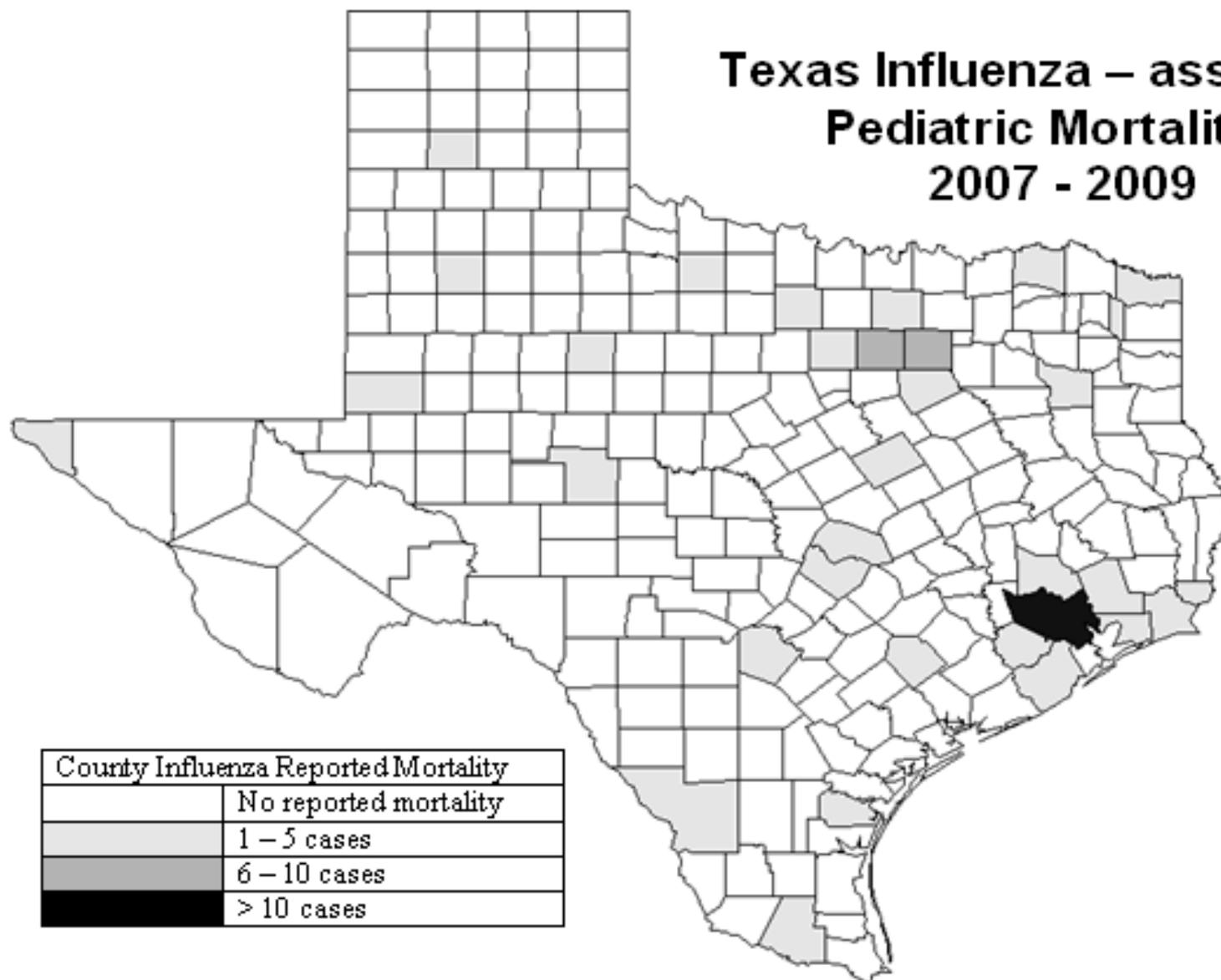
Medical Surge – Dell Children's Hospital



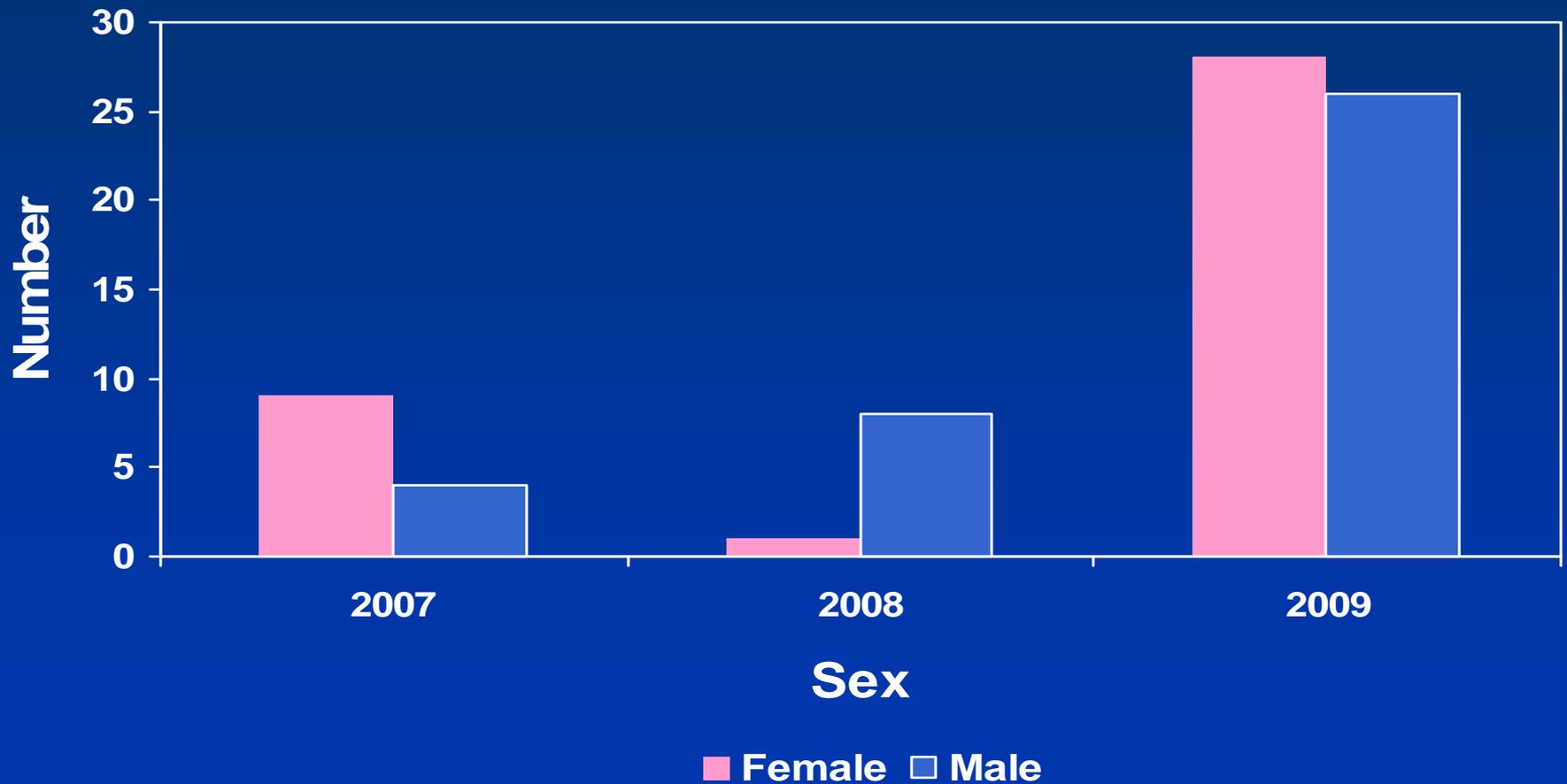
Medical Surge – Dell Children's Hospital



Texas Influenza – associated Pediatric Mortalities 2007 - 2009



Distribution of Sex by Year for Texas Pediatric Influenza Deaths 2007 - 2009



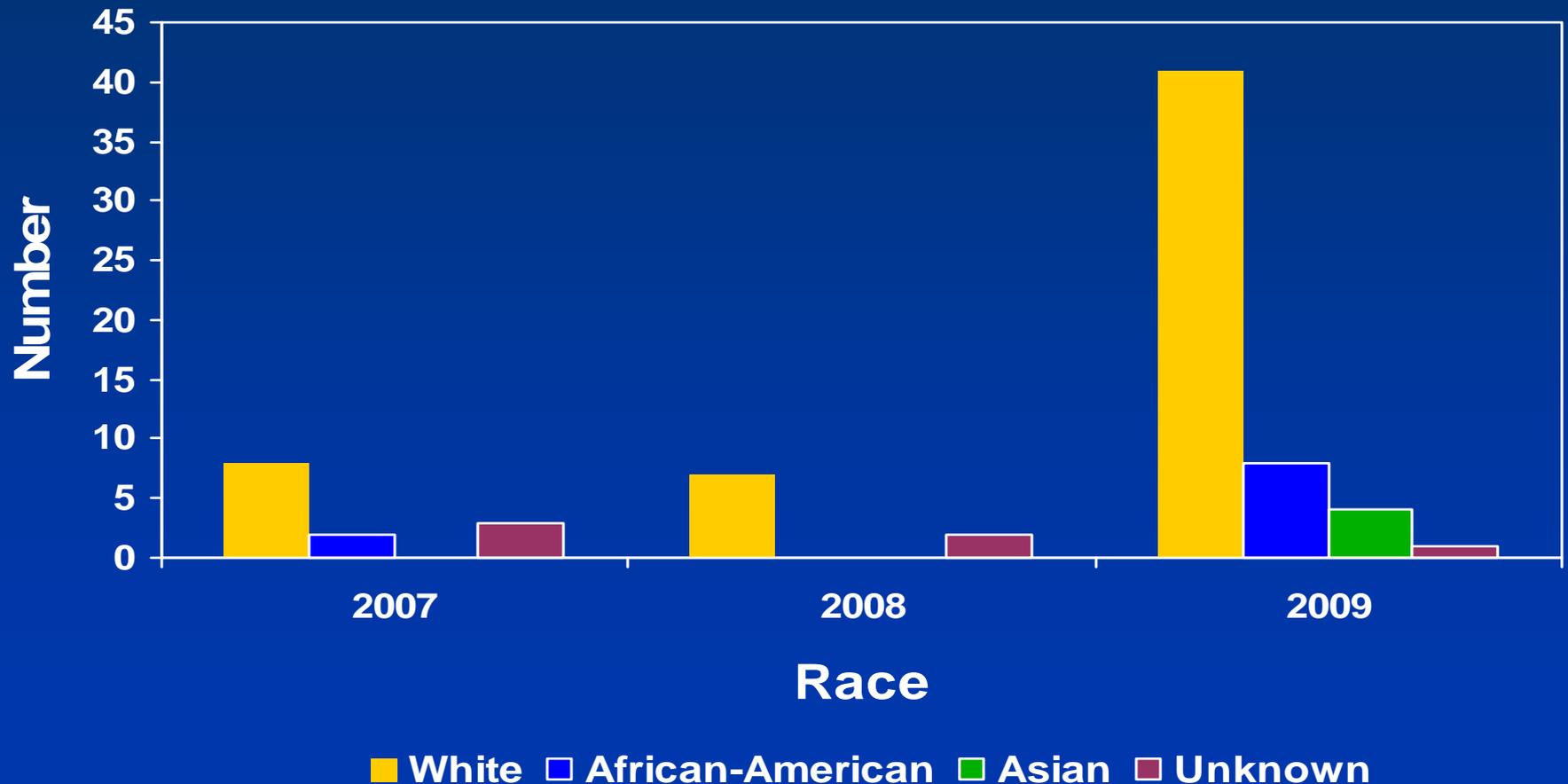
Measures of Association for Sex by Year

Year	2007/08	2009	Total
Male	12	26	38
Female	10	28	38
Total	22	54	76

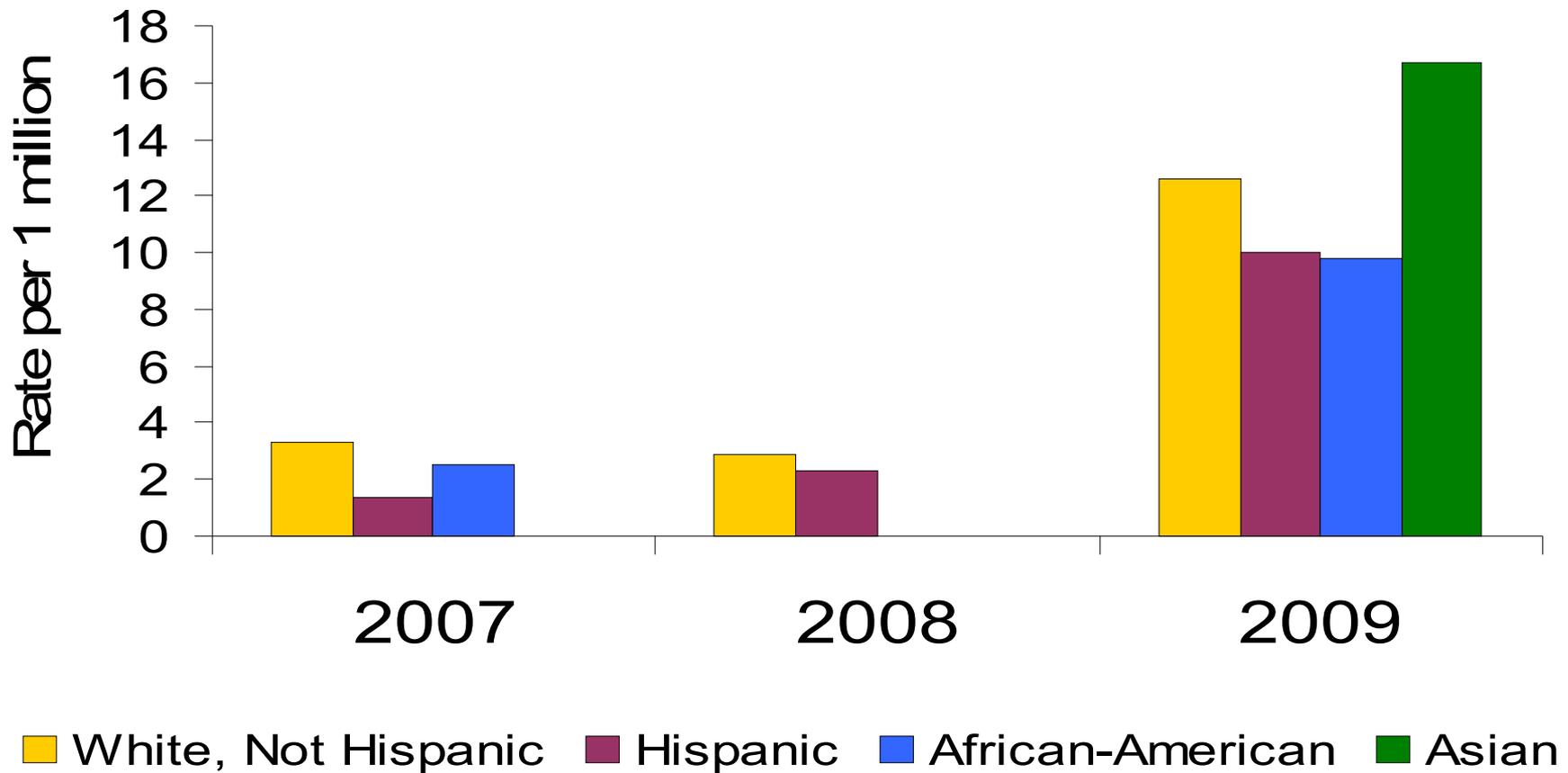
2 x 2
Chi-Square
p = 0.61

p value not statistically significant

Distribution of Race by Year for Texas Pediatric Influenza Deaths 2007 - 2009



Distribution of Race*/Ethnicity Rates for Texas Pediatric Influenza Deaths by Year



Measures of Association for Race* by Year

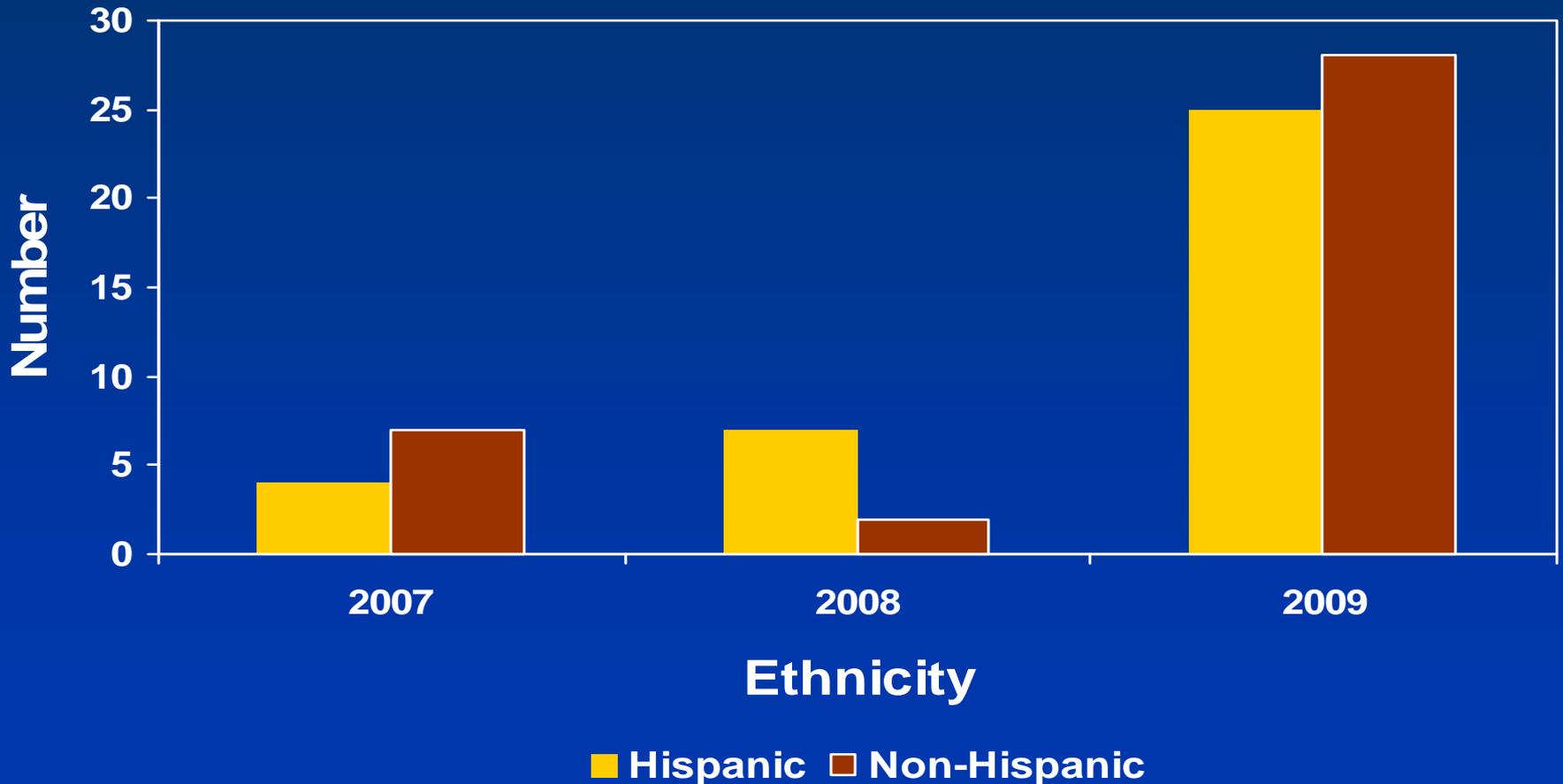
Year	2007/08	2009	Total
White	15	41	56
African-American	2	8	10
Asian	0	4	4
Total	17	53	70

3 x 2
Fisher Exact
p = 0.75

p value not statistically significant

*Race was unknown for 6 cases.

Distribution of Ethnicity by Year for Texas Pediatric Influenza Deaths 2007 - 2009



Measures of Association for Ethnicity* by Year

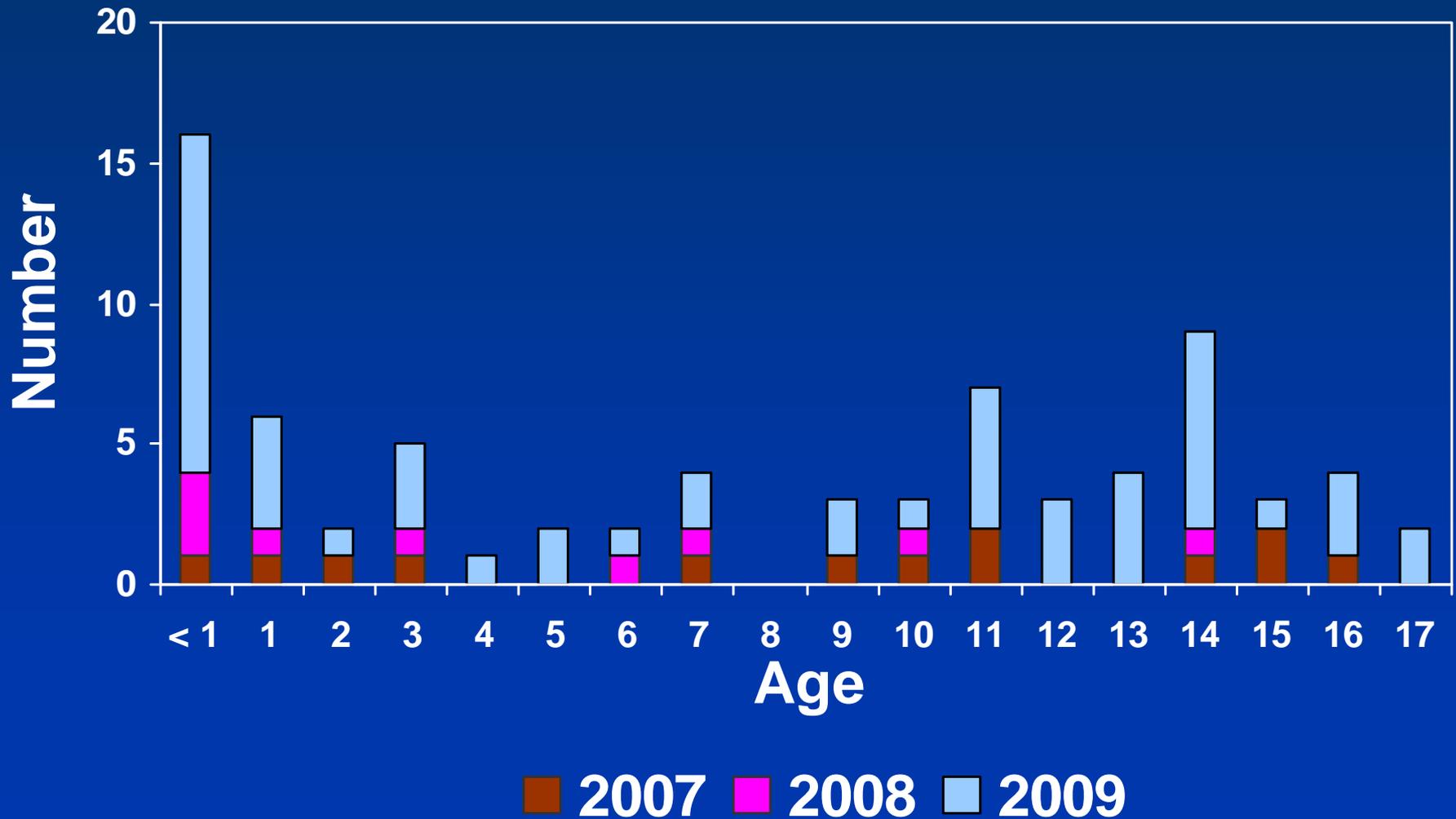
Year	2007/08	2009	Total
Hispanic	11	25	36
Non-Hispanic	9	28	37
Total	20	53	73

2 x 2
Chi-Square
p = 0.55

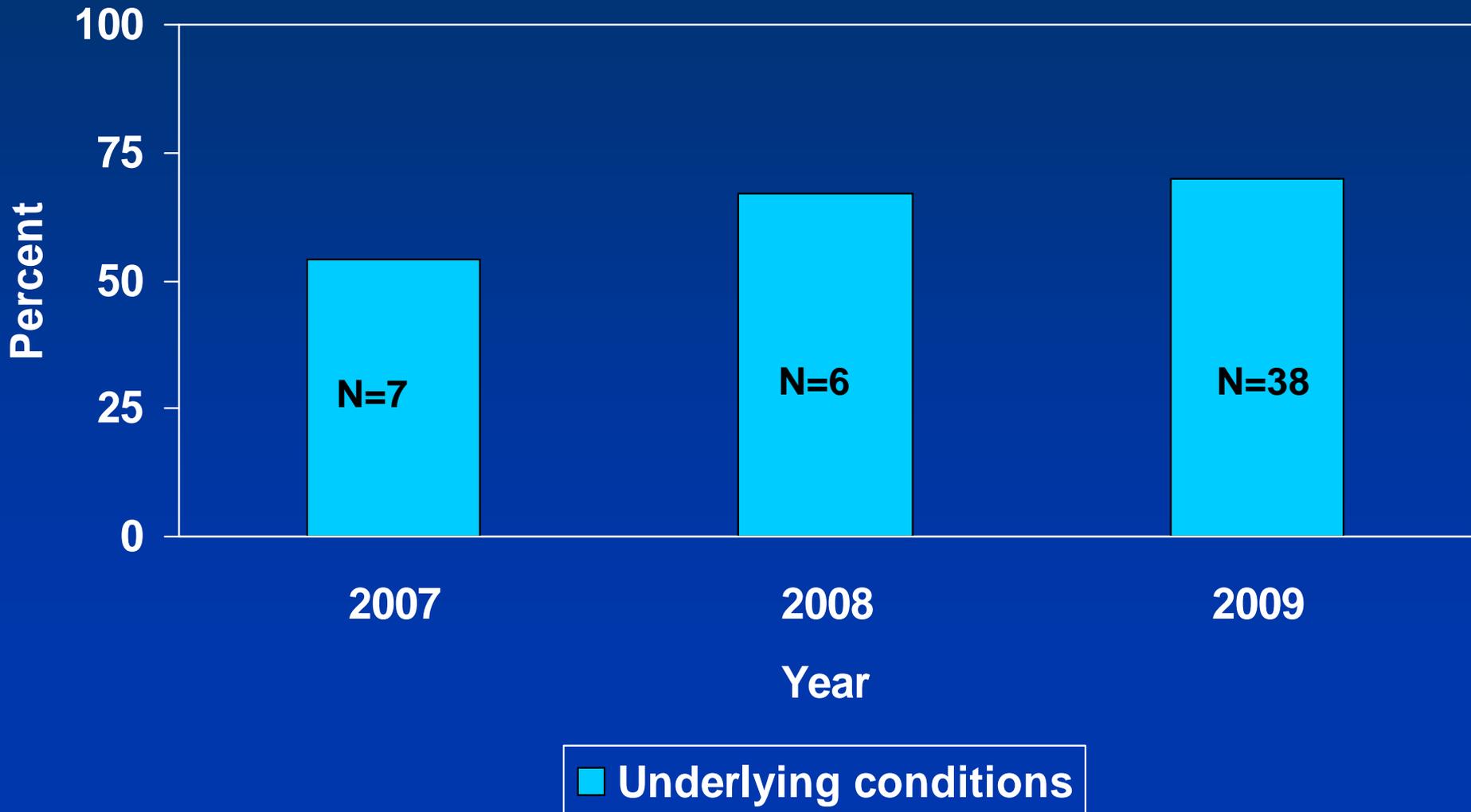
p value not statistically significant

*Ethnicity was unknown for 3 cases.

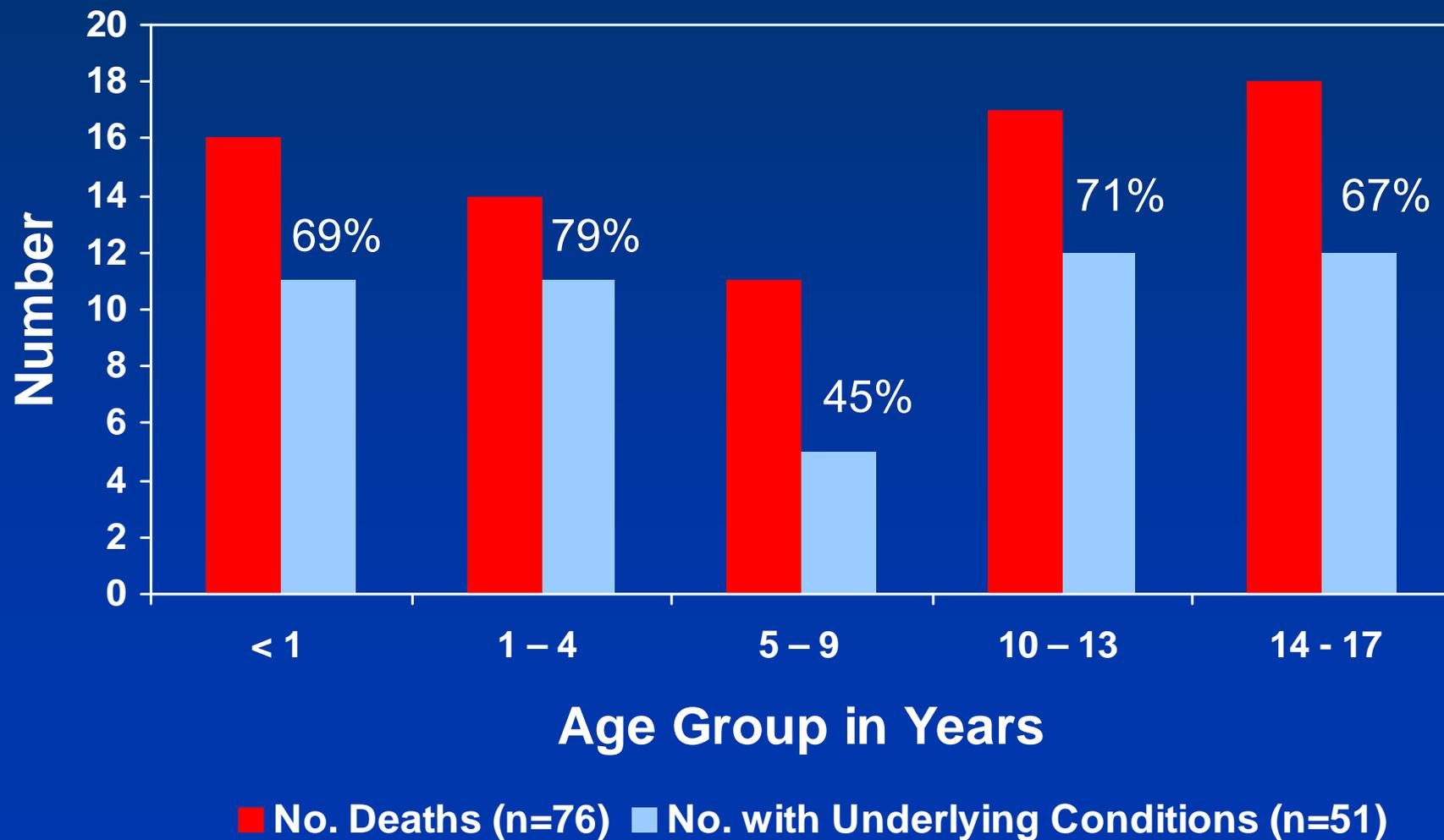
Distribution of Texas Pediatric Influenza Deaths by Age by Year 2007 - 2009



Tx Pediatric Influenza Deaths with Underlying Health Conditions by Year 2007-2009



Tx Pediatric Influenza Deaths with Underlying Health Conditions by Age Group by Year 2007 - 2009



Texas Pediatric Influenza Deaths with Underlying Health Conditions 2007-2009

Underlying conditions	2007/08	2009	Total
Children without	9	16	25
Children with	13	38	51
Total	22	54	76

2 x 2
Chi-Square
p = 0.34

p value not statistically significant

Texas Pediatric Influenza Deaths with Underlying Health Conditions 2007-2009

Developmental delay 20%

History of prematurity † 17 %

Pulmonary disease 17%

Neuromuscular 15%

Asthma 12%

Cardiac disease 12%

Seizure disorder 11%

† Data not consistently collected for history of prematurity.

Measures of Association for Antiviral Treatment by Year

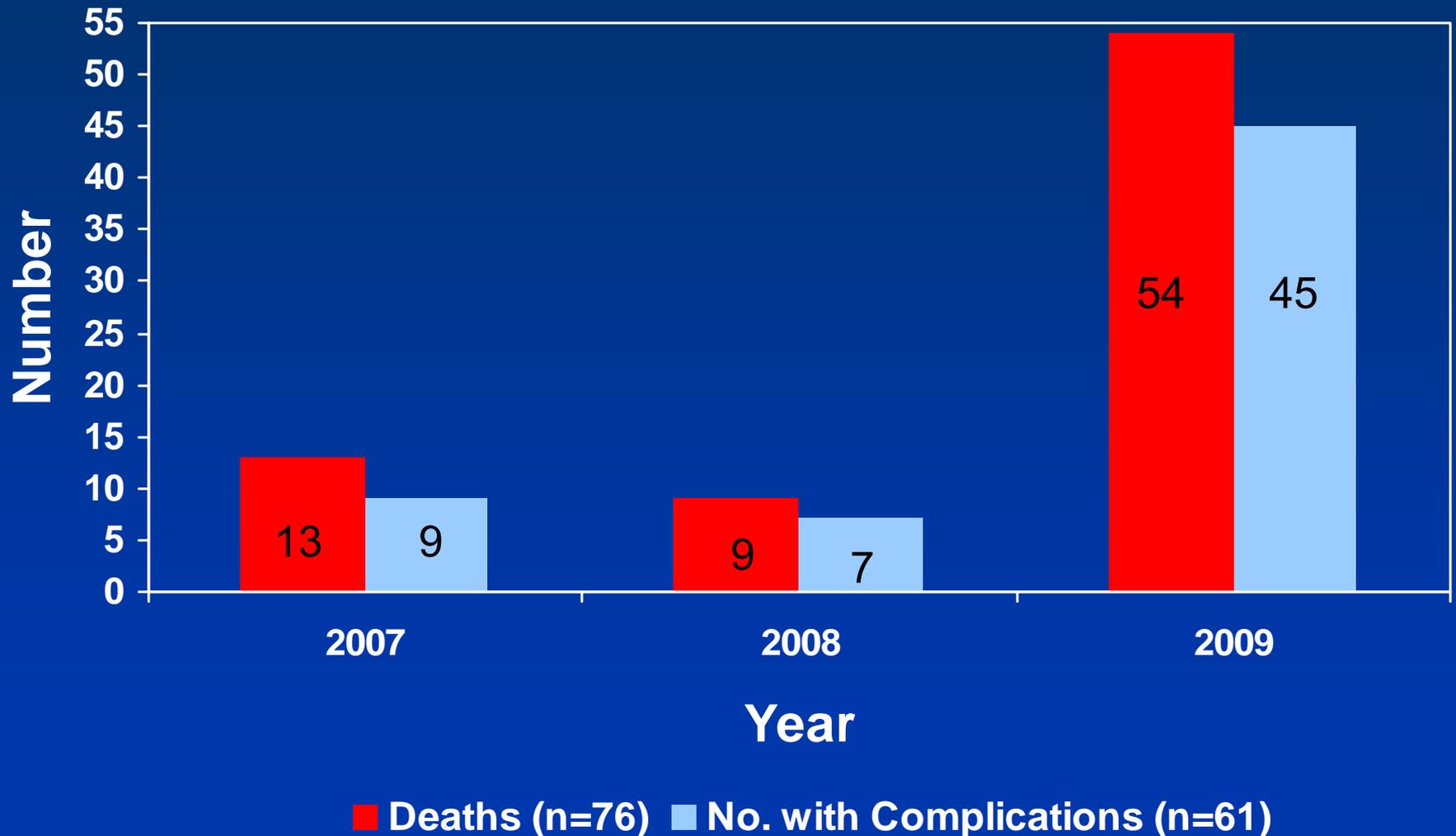
Year	2007/08	2009	Total
Yes	1	27	28
No*	21	27	48
Total	22	54	76

2 x 2
Chi-Square
p = **0.0001**

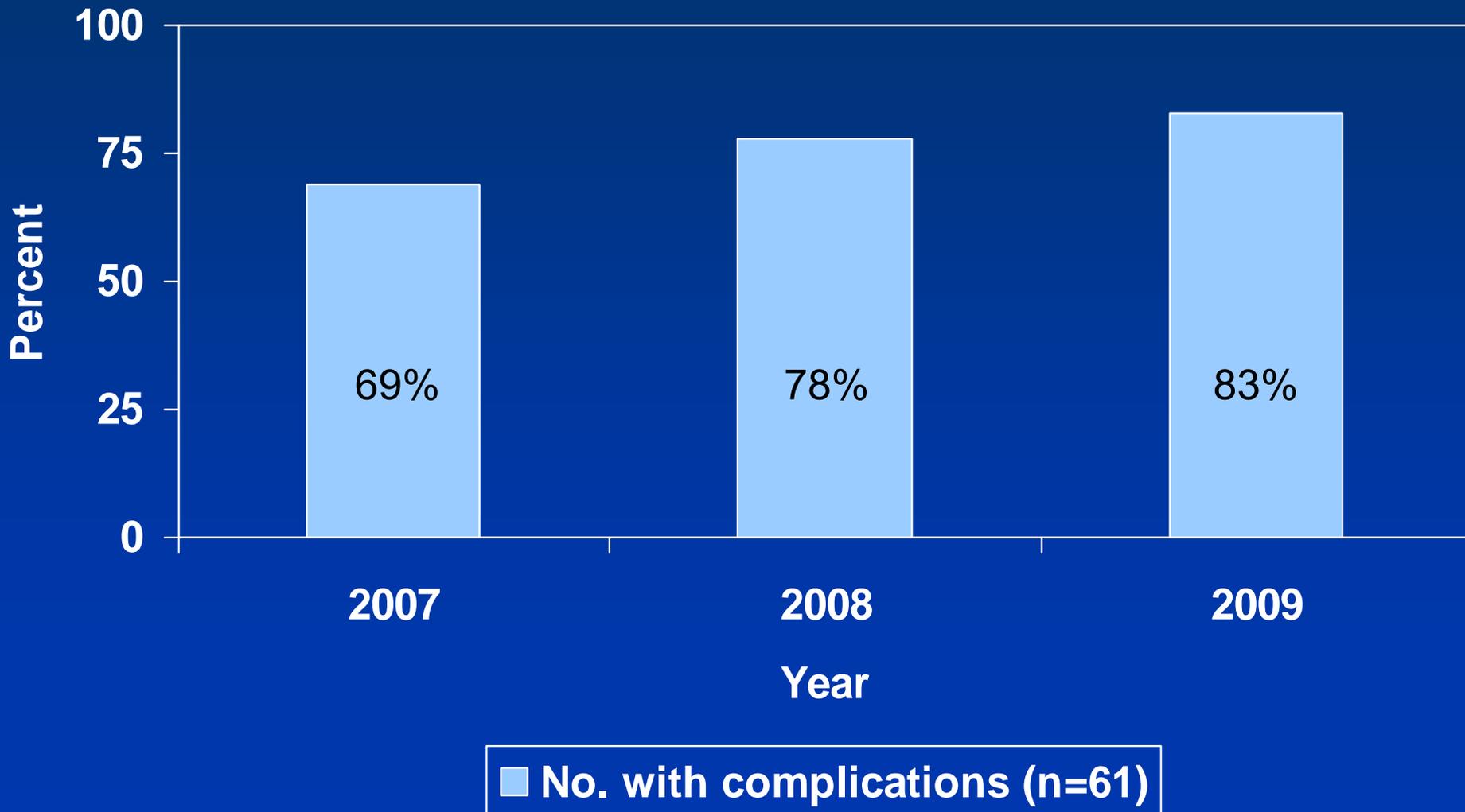
p value is statistically significant

*Includes no antiviral treatment or it was unknown if there was antiviral treatment.

Texas Pediatric Influenza Deaths with at Least One Complication by Year 2007-2009



Texas Pediatric Influenza Deaths with at Least One Complication by Year 2007-2009



Texas Pediatric Influenza Deaths With at least One Complication 2007-2009

Pneumonia/Bronchiolitis/Croup 51%

Sepsis 30%

ARDS 29%

Shock 26%

Bacterial co-infections 26%

Encephalitis 12%

Seizures 11%

Viral co-infections 7%

Other complications 29%

Texas Pediatric Influenza Deaths 2007-2009

9 cases with *Staphylococcus aureus*:

- 4 MRSA;
- 4 MSSA
- 1 unknown sensitivity

Texas Pediatric Influenza Deaths 2007-2009

11 cases with a variety of other co-infections:

- Acinetobacter,
- enterococcus,
- *Klebsiella pneumoniae*,
- *Pseudomonas aeruginosa*,
- *Staphylococcus epidermidis*,
- vancomycin-resistant enterococci
- Coagulase negative Staphylococcus,
- *Candida parapsilosis*,
- Group B Streptococcus,
- *Neisseria meningitides*,

Texas Pediatric Influenza Deaths 2007-2009

Vaccination status known on 52 children,

- 45 children were ≥ 6 months and eligible to be vaccinated

Of the eligible who were not vaccinated:

- seasonal flu - 39/45 (87%);
- pH1N1 flu – 15/15 (100%)

Summary

- 1st pandemic in 40 years
- > 4 fold increase in numbers of reports for pediatric deaths in 2009
- Unable to determine from this data if increase in deaths due to more virulent strain or due to increased emphasis on detection and reporting.

Summary

- Use of antivirals significantly increased in 2009 ($p=0.0001$).
- No significant differences between years associated with:
 - race
 - ethnicity
 - underlying medical conditions
 - complications
 - sterile specimen collection
 - bacterial results.

Lessons Learned

To Save Lives:

- Continue the use of antivirals
- Continue to encourage flu vaccination

Acknowledgements

- Local Health Department Staff
- DSHS Health Service Regional Staff
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- Rita Espinosa, MS
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- Grace Kubin, PhD
- Irene Brown
- Tony Aragon, MS
- Austin Clinical Epidemiology Team

Questions?

As the two friends wandered through the snow on their way home, Piglet grinned to himself, thinking how lucky he was to have a best friend like Pooh.



Pooh thought to himself:
"If the pig sneezes,
he's freakin dead."

