Vaccine Preventable Diseases: Early ID & Management for School Nurses

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Williamson County & Cities Health District

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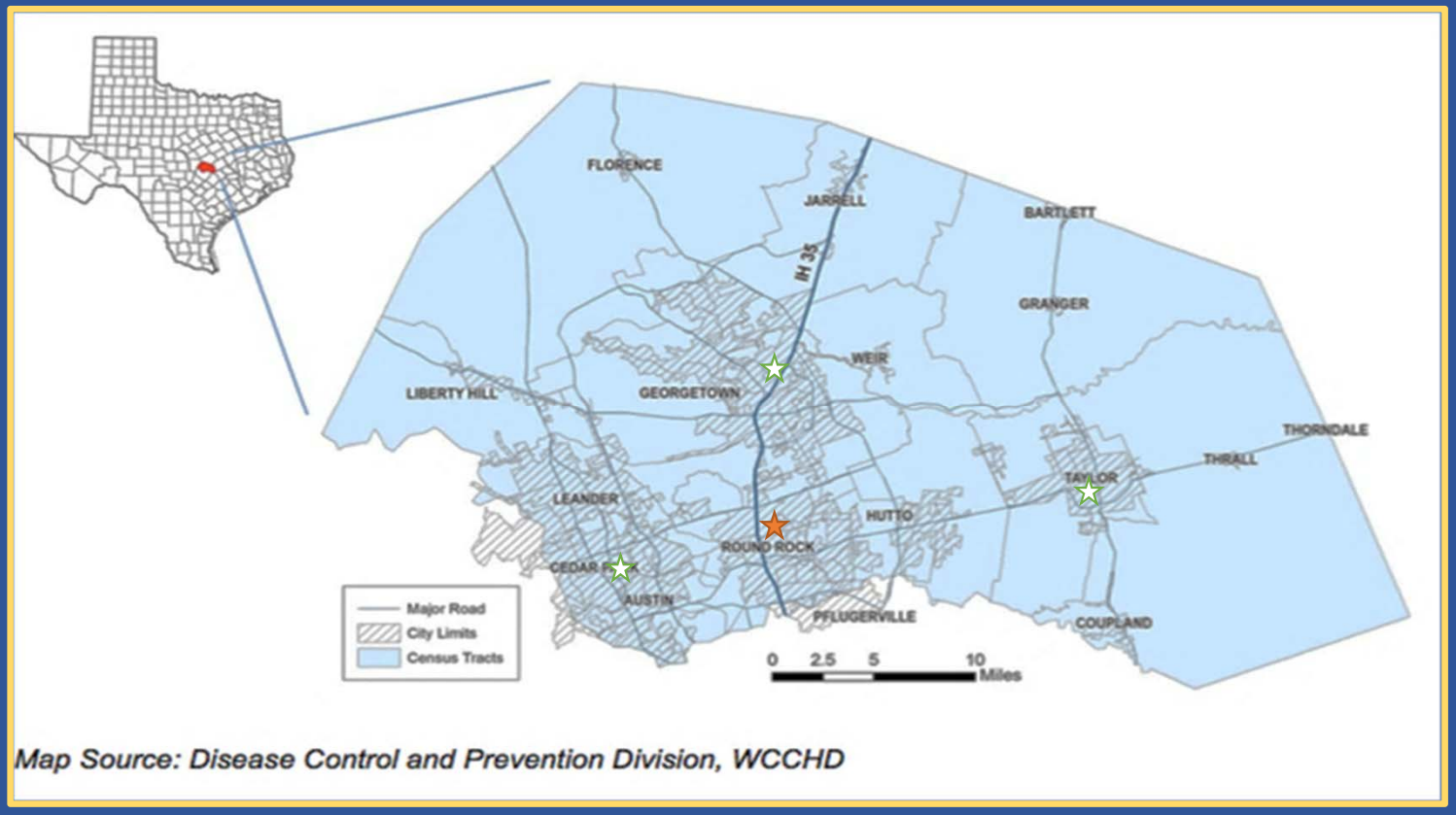
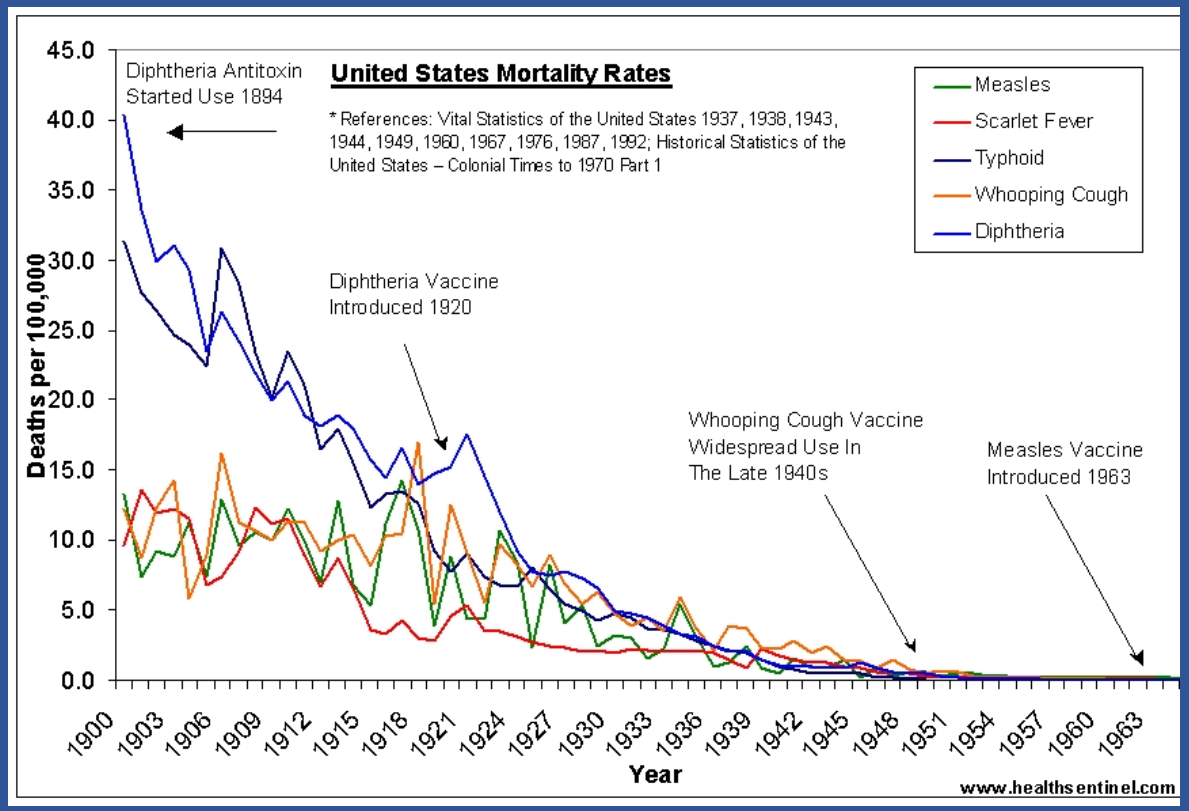


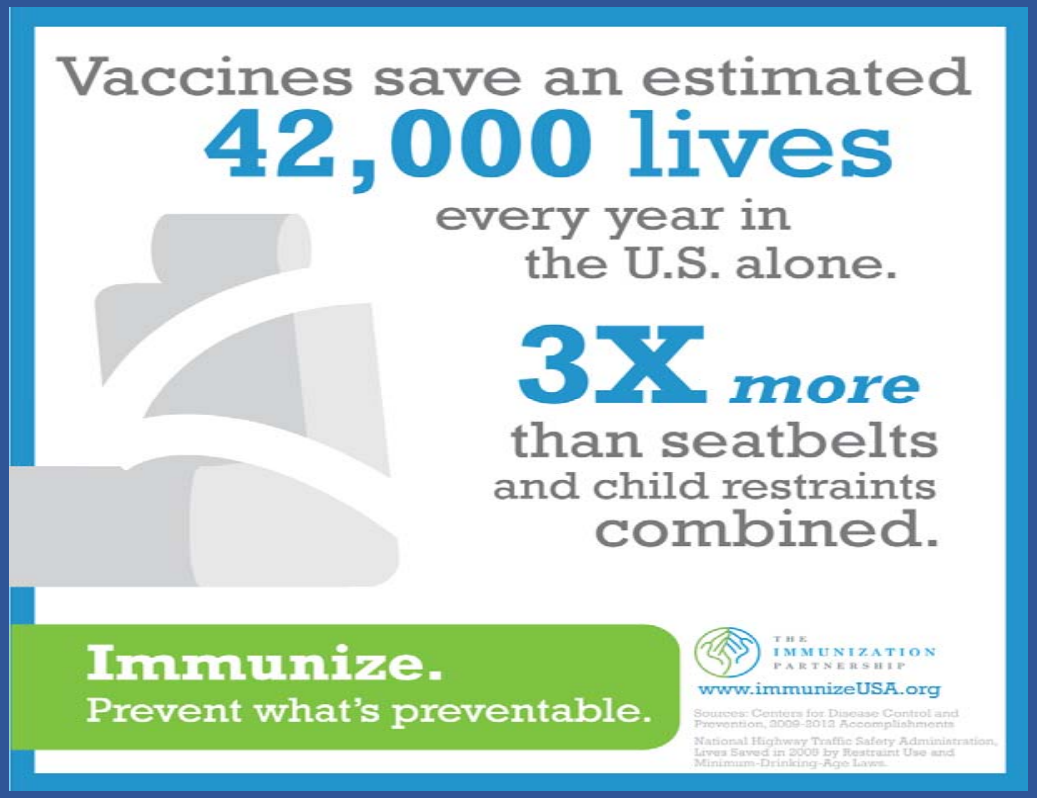
Map Source: Disease Control and Prevention Division, WCCHD

Agenda

1. Vaccination Introduction
2. Vaccine Preventable Diseases
3. Resources
4. Questions

Introduction


United States Mortality Rates
* References: Vital Statistics of the United States 1937, 1938, 1943, 1944, 1949, 1960, 1967, 1976, 1987, 1992; Historical Statistics of the United States – Colonial Times to 1970 Part 1
Diphtheria Antitoxin Started Use 1894
Diphtheria Vaccine Introduced 1920
Whooping Cough Vaccine Widespread Use In The Late 1940s
Measles Vaccine Introduced 1963
Measles
Scarlet Fever
Typhoid
Whooping Cough
Diphtheria
Deaths per 100,000
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1900
1903
1906
1909
1912
1915
1918
1921
1924
1927
1930
1933
1936
1939
1942
1945
1948
1951
1954
1957
1960
1963
Year
www.healthsentinel.com


Vaccines save an estimated
42,000 lives
every year in
the U.S. alone.
3X more
than seatbelts
and child restraints
combined.
Immunize.
Prevent what's preventable.
THE IMMUNIZATION PARTNERSHIP
www.immunizeUSA.org
Sources: Centers for Disease Control and Prevention, 2009-2012 Accomplishments
National Highway Traffic Safety Administration, Lives Saved in 2009 by Restraint Use and Minimum-Drinking-Age Laws.

For every $1 spent on a vaccine in the US...

DTaP saves
$27

MMR saves
$26

Perinatal Hepatitis B saves
$14.70

Inactivated Polio (IPV) saves
$5.45

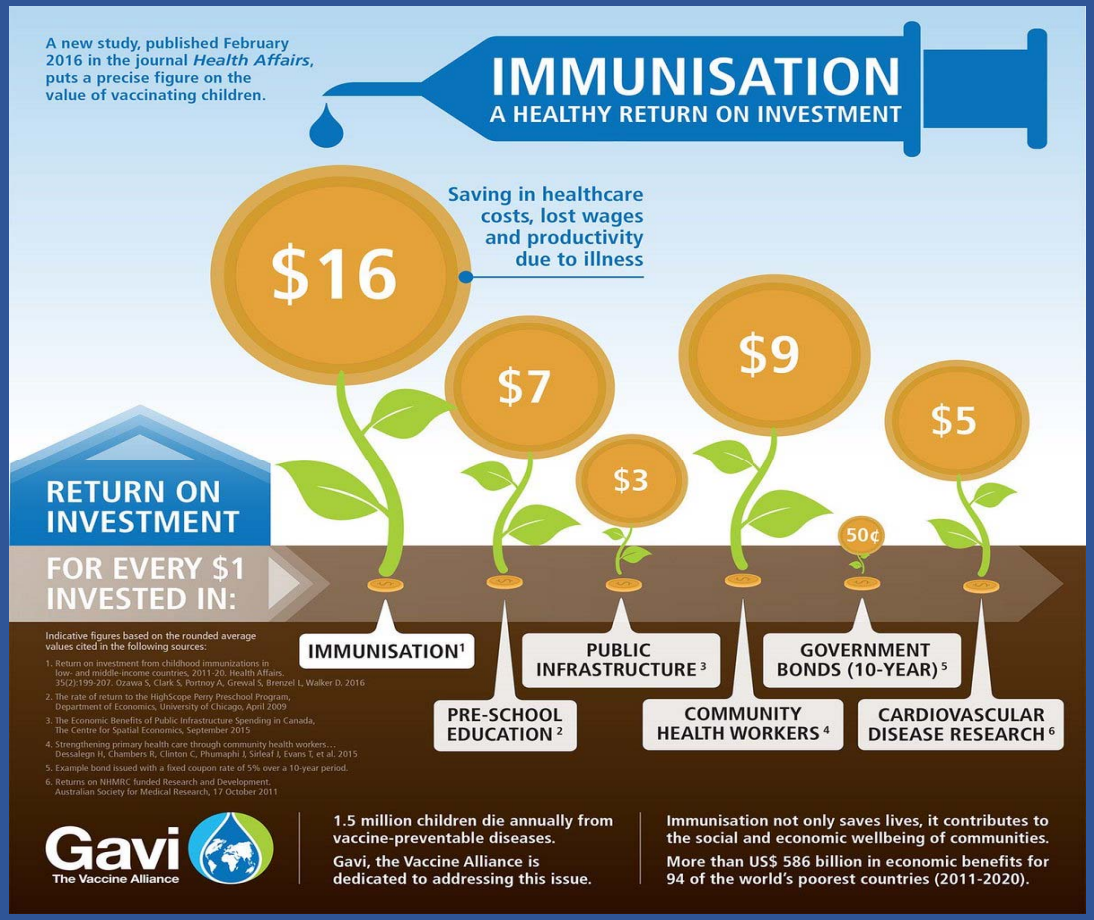
Varicella saves
$2.73

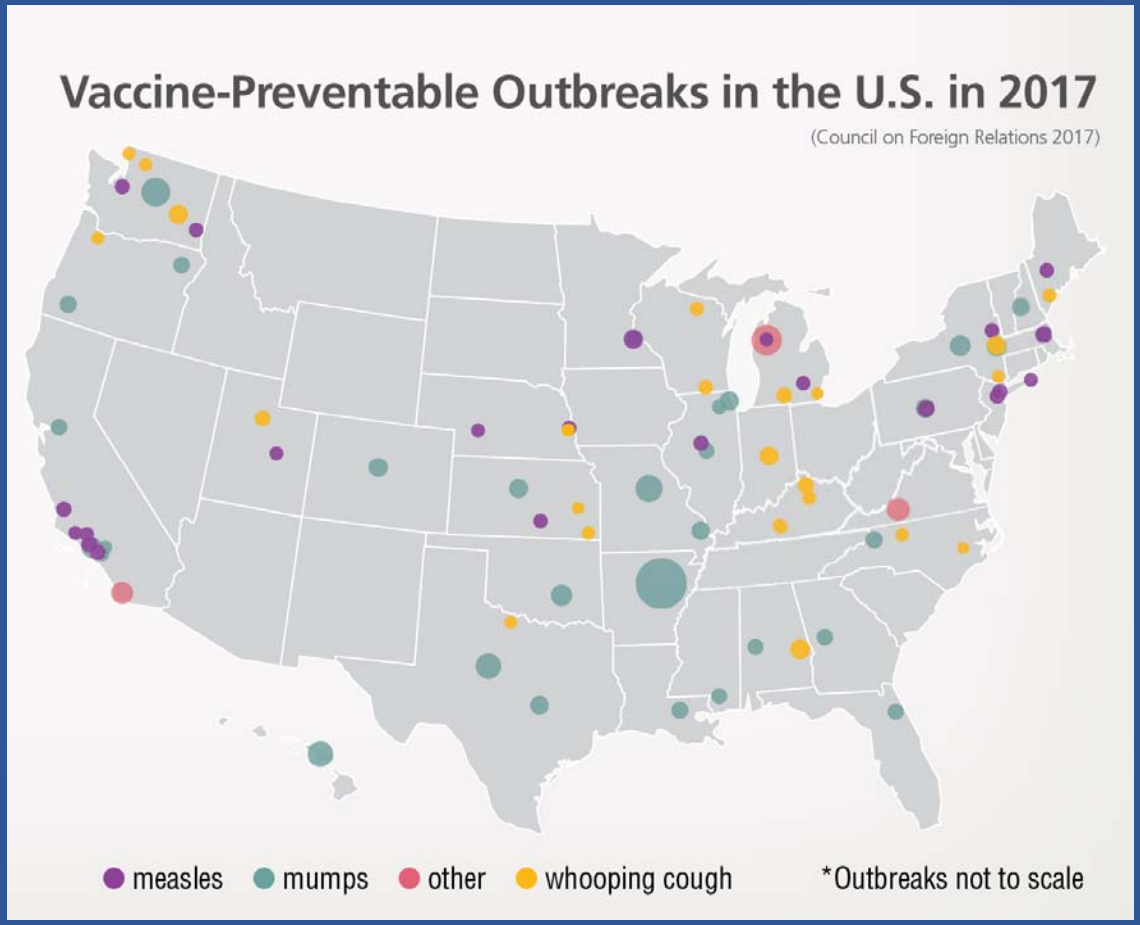
ECBT
every child by two

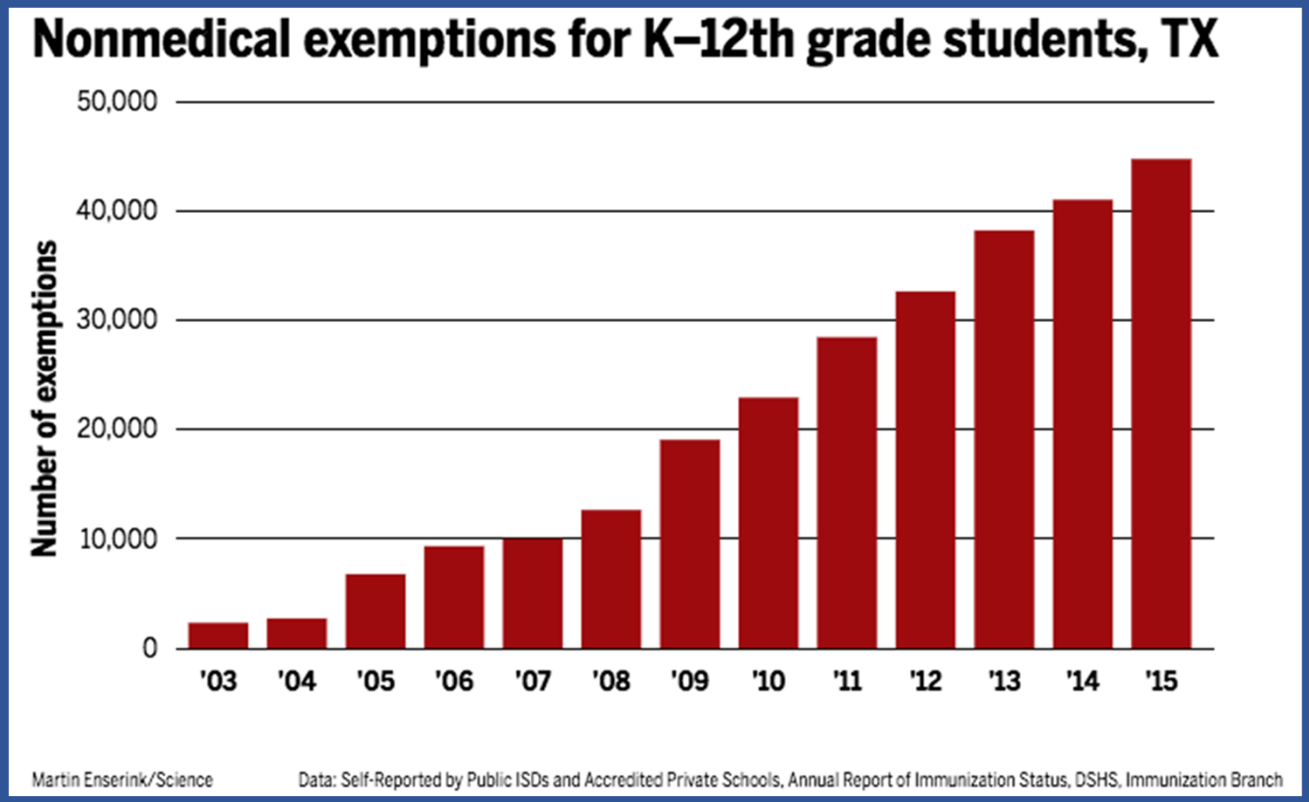
...with routine vaccination the US saves $13.5 billion in direct costs and $68.8 billion in societal costs.

Information from Economic Evaluation of the Routine Childhood Immunization Program in the United States, 2009, Presented at Pediatric Academic Societies' Annual Meeting, Boston, Massachusetts, Apr 28-May 1, 2012, Fangjun Zhou, PhD

Image courtesy of Vichaya Kiatying-Angsulee/FreeDigitalPhotos.net


A new study, published February 2016 in the journal *Health Affairs*, puts a precise figure on the value of vaccinating children.
IMMUNISATION
A HEALTHY RETURN ON INVESTMENT
Saving in healthcare costs, lost wages and productivity due to illness
$16
$7
$3
$9
50¢
$5
RETURN ON INVESTMENT
FOR EVERY $1 INVESTED IN:
IMMUNISATION[1]
PRE-SCHOOL EDUCATION[2]
PUBLIC INFRASTRUCTURE[3]
COMMUNITY HEALTH WORKERS[4]
GOVERNMENT BONDS (10-YEAR)[5]
CARDIOVASCULAR DISEASE RESEARCH[6]
Indicative figures based on the rounded average values cited in the following sources:
1. Return on investment from childhood immunizations in low- and middle-income countries, 2011-20. Health Affairs. 35(2):199-207. Ozawa S, Clark S, Portnoy A, Grewal S, Brenzel L, Walker D. 2016
2. The rate of return to the HighScope Perry Preschool Program, Department of Economics, University of Chicago, April 2009
3. The Economic Benefits of Public Infrastructure Spending in Canada, The Centre for Spatial Economics, September 2015
4. Strengthening primary health care through community health workers... Dessalegn H, Chambers R, Clinton C, Phumaphi J, Sirleaf J, Evans T, et al. 2015
5. Example bond issued with a fixed coupon rate of 5% over a 10-year period.
6. Returns on NHMRC funded Research and Development. Australian Society for Medical Research, 17 October 2011
Gavi
The Vaccine Alliance
1.5 million children die annually from vaccine-preventable diseases.
Gavi, the Vaccine Alliance is dedicated to addressing this issue.
Immunisation not only saves lives, it contributes to the social and economic wellbeing of communities.
More than US$ 586 billion in economic benefits for 94 of the world's poorest countries (2011-2020).


Vaccine-Preventable Outbreaks in the U.S. in 2017
(Council on Foreign Relations 2017)
measles
mumps
other
whooping cough
*Outbreaks not to scale


Nonmedical exemptions for K–12th grade students, TX
Number of exemptions
50,000
40,000
30,000
20,000
10,000
0
'03
'04
'05
'06
'07
'08
'09
'10
'11
'12
'13
'14
'15
Martin Enserink/Science
Data: Self-Reported by Public ISDs and Accredited Private Schools, Annual Report of Immunization Status, DSHS, Immunization Branch

Whooping cough case confirmed at Cedar Park Middle School, district says

4th Measles Case Confirmed At Texas' Southern Border

Mumps outbreak reported at Cedar Hill High School

ICE confirmed 51 facilities have reported investigations into mumps, chickenpox, and influenza

Texas investigating highly contagious whooping cough at state Capitol

Measles outbreak now reported in 30 US states

Measles Outbreak Continues in Oregon and Washington, With One New Case Reported Daily

Unvaccinated Child Gets Tetanus, Racks Up $800,000 in Costs

VPDs in School Settings

Objectives:

1) Recognize VPD symptoms
2) Report VPDs
3) Manage VPD Cases

VPDs on the rise:

- Pertussis
- Varicella
- Mumps
- Measles

VPDs on the rise:

- **Pertussis**
- Varicella
- Mumps
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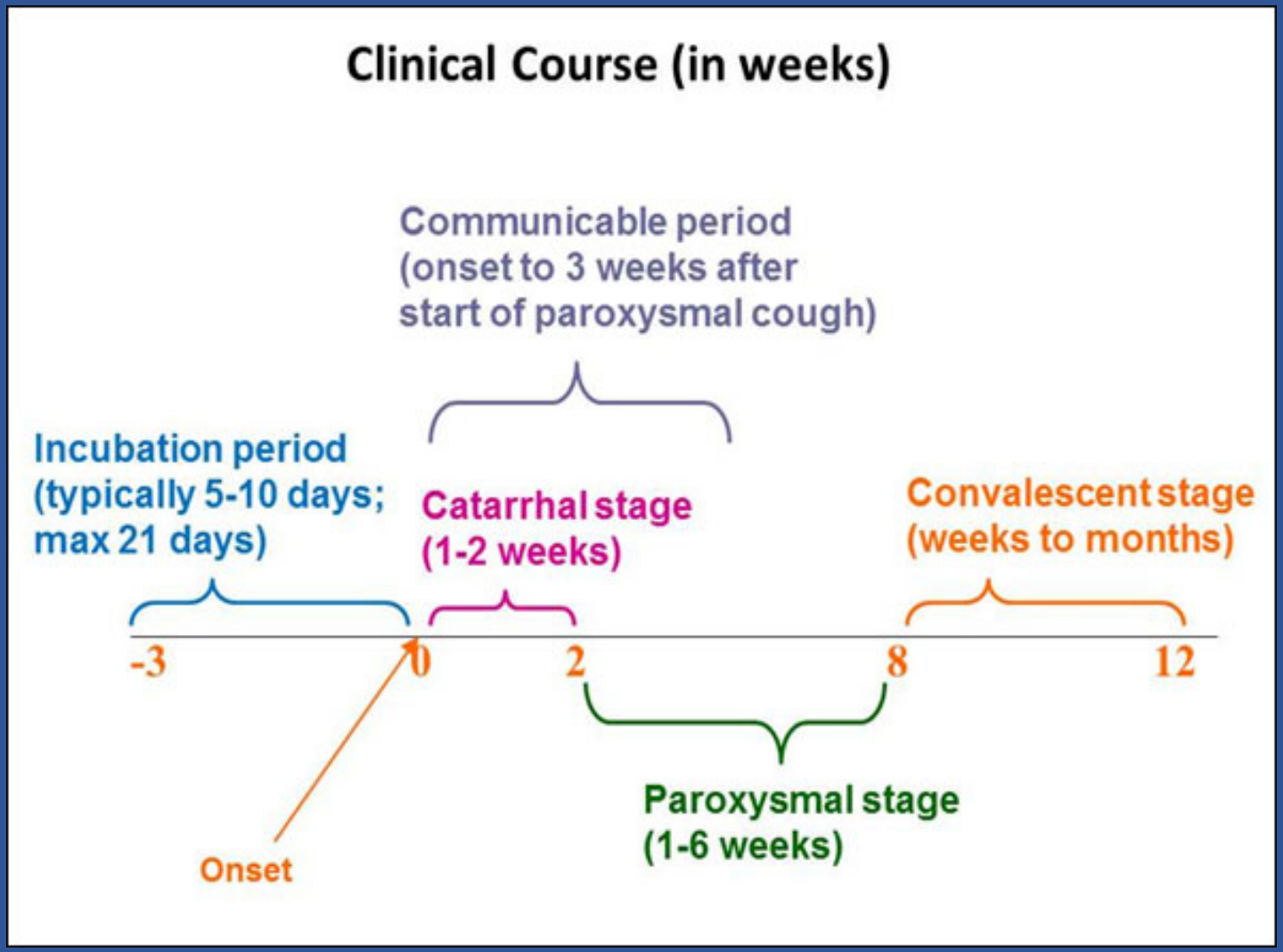
Pertussis

- *Bordetella pertussis*
- Airborne
- Symptoms
  - Rhinorrhea
  - Fever
  - Cough
  - Apnea



https://www.cdc.gov/pertussis/clinical/features.html

Pertussis

- Major complications
  - Infants & Children:
    - Pneumonia
    - Convulsions
    - Apnea
    - Encephalopathy
    - Death
  - Teens & Adults:
    - Rib fracture

Suspect Pertussis?

1. Isolate
2. Assess Immunity
3. Report

Texas Notifiable Conditions

24/7 Number for Immediately Reportable– 1-800-705-8868

Report confirmed and suspected cases.

Unless noted by *, report to your local or regional health department using number above or find contact information at http://www.dshs.state.tx.us/idcu/investigation/conditions/contacts/

A – I	When to Report	L – Y	When to Report
*Acquired immune deficiency syndrome (AIDS) [1, 2]	Within 1 week	***Lead, child blood, any level & adult blood, any level** [3]	**Call/Fax Immediately**
Amebiasis [4]	Within 1 week	Legionellosis [4]	Within 1 week
Amebic meningitis and encephalitis [4]	Within 1 week	Leishmaniasis [4]	Within 1 week
Anaplasmosis [4]	Within 1 week	Listeriosis [4,5]	Within 1 week
Anthrax [4,5]	**Call Immediately**	Lyme disease [4]	Within 1 week
Arboviral infections [4, 6]	Within 1 week	Malaria [4]	Within 1 week
*Asbestosis [7]	Within 1 week	**Measles (rubeola)** [4]	**Call Immediately**
Ascariasis [4]	Within 1 week	**Meningococcal infection, invasive (*Neisseria meningitidis*)** [4, 5]	**Call Immediately**
Babesiosis [4]	Within 1 week	**Multidrug-resistant *Acinetobacter* (MDR-A)** [4, 8]	**Within 1 work day**
Botulism (adult and infant) [4, 5, 9]	**Call Immediately** [9]	**Mumps** [4, 10]	**Within 1 work day** [10]
Brucellosis [4, 5]	**Within 1 work day**	Paragonimiasis [4]	Within 1 week
Campylobacteriosis [4]	Within 1 week	**Pertussis** [4]	**Within 1 work day**
*Cancer [11]	See rules [11]	*Pesticide poisoning, acute occupational [12]	Within 1 week
Carbapenem-resistant *Enterobacteriaceae* (CRE) [4, 13]	**Within 1 work day**	**Plague (*Yersinia pestis*)** [4, 5]	**Call Immediately**
Chagas disease [4]	Within 1 week	**Poliomyelitis, acute paralytic** [4]	**Call Immediately**
*Chancroid [1]	Within 1 week	**Poliovirus infection, non-paralytic** [4]	**Within 1 work day**
Chickenpox (varicella) [14]	Within 1 week	Prion disease such as Creutzfeldt-Jakob disease (CJD) [4, 15]	Within 1 week
*Chlamydia trachomatis infection [1]	Within 1 week	**Q fever** [4]	**Within 1 work day**
*Contaminated sharps injury [16]	Within 1 month	**Rabies, human** [4]	**Call Immediately**
***Controlled substance overdose** [17]	**Call Immediately**	**Rubella (including congenital)** [4]	**Within 1 work day**
Coronavirus, novel [4, 18]	**Call Immediately**	Salmonellosis, including typhoid fever [4, 5]	Within 1 week
Cryptosporidiosis [4]	Within 1 week	Shiga toxin-producing *Escherichia coli* [4, 5]	Within 1 week
Cyclosporiasis [4]	Within 1 week	Shigellosis [4]	Within 1 week
Cysticercosis [4]	Within 1 week	*Silicosis [19]	Within 1 week
*Cytogenetic results (fetus and infant only) [20]	See rules [20]	**Smallpox** [4]	**Call Immediately**
Diphtheria [4, 5]	**Call Immediately**	*Spinal cord injury [21]	Within 10 work days
*Drowning/near drowning [21]	Within 10 work days	Spotted fever group rickettsioses [4]	Within 1 week
Echinococcosis [4]	Within 1 week	***Staphylococcus aureus*, VISA and VRSA** [4, 5]	**Call Immediately**
Ehrlichiosis [4]	Within 1 week	Streptococcal disease (groups A, B; *S. pneumo*), invasive [4, 5]	Within 1 week
Fascioliasis [4]	Within 1 week	***Syphilis – primary and secondary stages** [1, 22]	**Within 1 work day**
*Gonorrhea [1]	Within 1 week	*Syphilis – all other stages [1, 22]	Within 1 week
Haemophilus influenzae, invasive [4, 5]	Within 1 week	*Taenia solium* and undifferentiated *Taenia* infection [4]	Within 1 week
Hansen's disease (leprosy) [4]	Within 1 week	Tetanus [4]	Within 1 week
Hantavirus infection [4]	Within 1 week	*Traumatic brain injury [21]	Within 10 work days
Hemolytic uremic syndrome (HUS) [4]	Within 1 week	Trichinosis [4]	Within 1 week
Hepatitis A [4]	**Within 1 work day**	Trichuriasis [4]	Within 1 week
Hepatitis B, C, and E (acute) [4]	Within 1 week	**Tuberculosis (*Mycobacterium tuberculosis* complex)** [5, 23]	**Within 1 work day**
Hepatitis B infection identified prenatally or at delivery (mother) [4]	Within 1 week	Tuberculosis infection [24]	Within 1 week
Hepatitis B, perinatal (HBsAg+ < 24 months old) (child) [4]	**Within 1 work day**	**Tularemia** [4, 5]	**Call Immediately**
Hookworm (ancylostomiasis) [4]	Within 1 week	Typhus [4]	Within 1 week
***Human immunodeficiency virus (HIV), acute infection** [1, 2, 25]	**Within 1 work day**	***Vibrio* infection, including cholera** [4, 5]	**Within 1 work day**
*Human immunodeficiency virus (HIV), non-acute infection [1, 2, 25]	Within 1 week	**Viral hemorrhagic fever (including Ebola)** [4]	**Call Immediately**
Influenza-associated pediatric mortality [4]	**Within 1 work day**	**Yellow fever** [4]	**Call Immediately**
Influenza, novel [4]	**Call Immediately**	Yersiniosis [4]	Within 1 week

In addition to specified reportable conditions, *any outbreak, exotic disease, or unusual group expression of disease that may be of public health concern should be reported by the most expeditious means available*

***See condition-specific footnote for reporting contact information**

E59-11364 (Rev. 1/17) Expires 1/31/18 – Go to http://www.dshs.state.tx.us/idcu/investigation/conditions/ or call your local or regional health department for updates.

Suspect Pertussis?

1. Isolate
2. Assess Immunity
3. Report

1. Assess Risk
2. Assess Immunity
3. Exclude
4. Implement prevention efforts

Pertussis Management

- If case confirmed…
  - **Child must complete 5 days of antibiotic before returning to school**
  - 1 case – school determines how/if inform parents
  - 2+ cases – DSHS recommends sending letters to parents
  - 3+ cases - Unimmunized children should stay home 21 days from exposure date
  - Post-exposure prophylaxis: Household contacts
  - Observe close contacts for ≥14 days after last contact with exposed person.
    - Persistent cough needs to be evaluated by MD.

VPDs on the rise:

- Pertussis
- **Varicella**
- Mumps
- Measles

Varicella

- *Human herpesvirus 3* (VZV)
- Spread via direct contact and respiratory secretions
- Symptoms
  - Rash
  - Fever
  - Fatigue
  - Loss of appetite

Varicella

- Major complications
  - Bacterial infection of lesions
  - Pneumonia
  - Encephalitis
  - Cerebellar ataxia
  - Hemorrhagic complications
  - Sepsis
  - Dehydration
  - Death

Suspect Varicella?

1. Isolate
2. Assess Immunity
3. Report

Suspect Varicella?

1. Isolate
2. Assess Immunity
3. Report

1. Assess Risk
2. Assess Immunity
3. Exclude
4. Implement prevention efforts

Varicella Management

- If case confirmed…
  - **Child may return to school when the rash has crusted**
    - **24 hrs passed with no new lesions occurring**
  - 3+ cases - Unimmunized children should stay home 21 days from exposure date
  - Post-exposure immunization may prevent disease.
  - Observe close contacts for ≥21 days after last contact with exposed person.

VPDs on the rise:

- Pertussis
- Varicella
- **Mumps**
- Measles

Mumps

- *Mumps rubulavirus*
- Transmitted via saliva or respiratory droplets
- Symptoms
  - Fever
  - Headache
  - Myalgia
  - Malaise
  - Loss of appetite
  - Parotitis

Mumps

- Major Complications
  - Unilateral or bilateral parotitis
  - Orchitis
  - Pancreatitis
  - Oophoritis
  - Meningitis
  - Encephalitis
  - Deafness

Suspect Mumps?

Suspect Mumps?

1. Isolate
2. Assess Immunity
3. Report

Suspect Mumps?

1. Isolate
2. Assess Immunity
3. Report

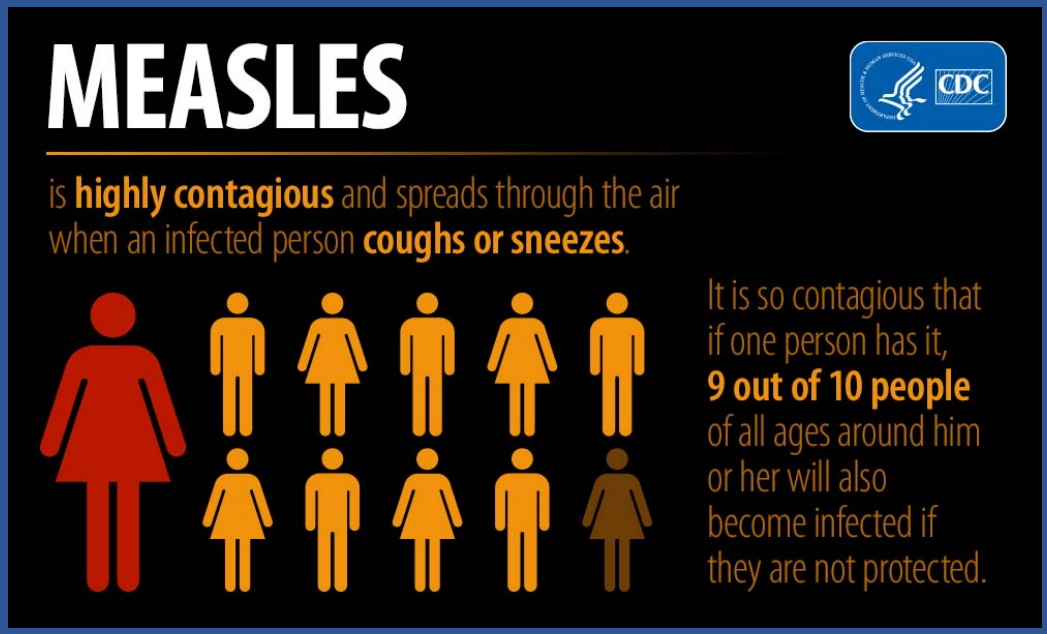
1. Assess Risk
2. Assess Immunity
3. Exclude
4. Implement prevention efforts

Mumps Management

- If case confirmed…
  - **Child may return to school 9 days after parotitis onset**
  - 3+ cases - Unimmunized children should stay home 26 days from parotitis onset in last student
    - Can be readmitted immediately after vaccinated with one dose
  - Persons with 2 doses should receive a 3rd dose during an outbreak

VPDs on the rise:

- Pertussis
- Varicella
- Mumps
- **Measles**



Measles

- *Measles morbillivirus*
- Transmitted via respiratory droplets
- Symptoms
  - Fever
  - Koplik spots
  - Cough
  - Coryza
  - Conjunctivitis
  - Descending rash

Measles

- Major complications
  - Diarrhea
  - Pneumonia
  - Encephalitis
  - Respiratory and neurological complications
  - Low-birth-weight
  - Fetal demise

Suspect Measles?

Suspect Measles?

1. Isolate
2. Assess Immunity
3. Report

Suspect Measles?

1. Isolate
2. Assess Immunity
3. Report

1. Assess Risk
2. Assess Immunity
3. Exclude
4. Implement prevention efforts

Measles Management

- If case confirmed…
  - **Child may return to school 4 days after rash onset**
  - 1+ case – Unimmunized children must stay home 21 days from exposure date
    - Can be readmitted immediately after 1 dose
  - Vaccination of un(der)vaccinated persons within 72 hours of exposure may provide protection.

Vaccination Resources

Texas Vaccines for Children

- Low cost vaccines for:
  - Uninsured
  - Medicaid
  - CHIP
  - Native American/ Alaska Native
- Adult Safety Net

ImmTrac

Texas registry for children, adults, first responders

No cost service

Consolidates immunization records

Restricted access only to authorized entities

Opt-in System

Parental consent required for children <18 years

Consent required for 18+ years

Questions?

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