



## Lunch and Learn: North Dakota School Immunization Rates

2013-2014 School Year

### Compliance with School Requirements- State Law

**23-07-17.1. Inoculation required before admission to school.**

1. A child may not be admitted to any **public, private, or parochial school, or day care center, child care facility, head start program, or nursery school** operating in this state or be supervised through **home-based instruction** unless the child's parent or guardian presents to the institution authorities a certification from a licensed physician or authorized representative of the state department of health that the child has received age appropriate immunization against diphtheria, pertussis, tetanus, measles, rubella (German measles), mumps, hepatitis B, haemophilus influenza type b (Hib), varicella (chickenpox), poliomyelitis, pneumococcal disease, meningococcal disease, rotovirus, and hepatitis A. In the case of a child receiving home-based instruction, the child's parent or legal guardian shall file the certification with the public school district in which the child resides.

### North Dakota State Law (continued)

2. A child may enter an institution upon submitting **written proof** from a licensed physician or **authorized representative of the state department of health** stating that the child has started receiving the **required immunization** or has a written consent by the child's parent or guardian for a local health service or department to administer the needed immunization without charge or has complied with the requirements for **certificate of exemption** as provided for in subsection 3.

3. Any minor child, through the child's parent or guardian, may submit to the institution authorities either a certificate from a licensed **physician stating** that the physical condition of the child is such that immunization would **endanger the life or health of the child** or a certificate signed by the child's **parent or guardian** whose **religious, philosophical, or moral beliefs are opposed to such immunization**. The minor child is then exempt from the provisions of this section.

4. The enforcement of subsections 1, 2, and 3 is the **responsibility of the designated institution authority(school)**.

### Exclusion X

- o Students who do not provide proof of required vaccinations or claim an exemption should be excluded from school.
  - o Grace period of 30 days after the start of school
  - o It is the school's responsibility to enforce the vaccination requirements and exclusion.
- o Parents can claim one of the following exemptions:
  - o Philosophical
  - o Religious
  - o Moral
  - o History of Disease (chickenpox only)
  - o Medical- requires signature of medical professional

### 2014-2015 School Immunization Requirements

Vaccine Type	Number of Doses Required Per Grade		
	Kindergarten	Grades 1-6	Grades 7-12
DTaP/DTp/DT/Tdap/Td*	5	5	5
Hepatitis B	3	3	3
IPV/OPV†	4	4	4
MMR	2	2	2
Varicella (Chickenpox)	2†	2†	1*
Meningococcal††	0	0	1
Tdap‡	0	0	1

### Change in requirements

- o The middle school will be changing for the 2014-2015 school year.
- o Tdap and Meningococcal vaccine will be required for 7<sup>th</sup> grade entry.
- o Previously, these vaccines were required for "middle school entry."
  - o This was 6<sup>th</sup> or 7<sup>th</sup> grade depending on the school.

### Healthy People 2020 Goals for Kindergarten Entry

Vaccine	Doses	Coverage Goal
DTaP	4	95%
MMR	2	95%
Polio	3	95%
Hepatitis B	3	95%
Varicella	2	95%

### Healthy People 2020 Goals for Adolescents age 13-15 years

Vaccine	Doses	Coverage Goal
Tdap	1	80%
Varicella	2	90%
MCV4	1 or more	80%
HPV	3 or more	80%

### Importance of Herd Immunity AKA "Community Immunity"

- o Vaccines are not 100% effective, so the more people who are vaccinated, the better chance that the disease will not spread.
- o 95% coverage rates ensure that if a Vaccine Preventable disease is introduced into a population, it will not spread.
- o Community Immunity protects non-responders and those who cannot receive vaccine due to a contraindication.

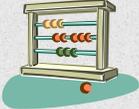
### The Math of Herd Immunity

- o  $R_0$  = the number of people a case will infect.
- o  $S$  = the proportion of people who are susceptible to the disease.
- o  $HI$  = The proportion of population that is immune.
  - o  $HI + S = 1$  (because immune + susceptible should equal 100% of the population.
  - o  $R_0 \times S = 1$  (in order for a disease to keep spreading, at least one person must contract the disease. Therefore,  $R_0$  (the number of people a sick person will infect times the number of susceptible people must equal at least 1.)
- o Must solve for HI to find out how many people must be immune to prevent spread of the disease.



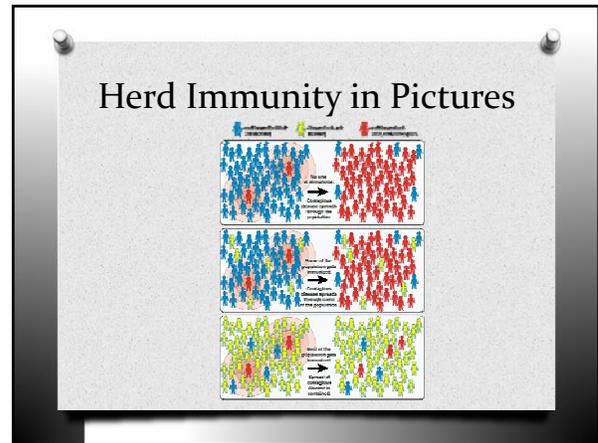
### The Math of Herd Immunity

- o  $HI + S = 1$
- o  $R_0 \times S = 1$
- o Solve for HI:
  - o  $1 / R_0 = S$
  - o  $HI + 1 / R_0 = 1$
  - o  $HI = 1 - 1 / R_0$
- o  $R_0$  has been determined for Vaccine preventable diseases so the Herd Immunity Threshold can be calculated.



### Herd Immunity Thresholds

Immunization	R <sub>0</sub>	Herd Immunity Threshold	Kindergarten Immunization Rate	Private School Rates	Public School Rates
Diphtheria	6-7	85%	90.15%	86.70%	90.39%
Measles	12-18	83-94%	89.97%	86.38%	90.22%
Mumps	4-7	75-86%	89.97%	86.38%	90.22%
Pertussis	12-17	92-94%	90.15%	86.70%	90.39%
Polio	5-7	80-86%	90.66%	87.48%	90.89%
Rubella	6-7	83-85%	89.97%	86.38%	90.22%



### Why Vaccinated Individuals may get Vaccine Preventable Diseases

- o No vaccine is 100% effective.
  - o Most childhood vaccines are 85% to 95% effective. Some people will not develop immunity.
- o In the United States, the number of people who have been vaccinated vastly outnumber those who have not.
  - o In an outbreak situation, the number of vaccinated cases may outnumber unvaccinated cases. However, the **percentage** of vaccinated ill individuals will be much lower than the percentage of unvaccinated individuals.

### Hypothetical Situation

- o High school with 1,000 students has a measles outbreak
  - o 995 students are vaccinated
  - o 5 students are unvaccinated
- o 7 vaccinated students become infected and 5 unvaccinated students.
  - o 58% of cases were vaccinated.
  - o **100%** of unvaccinated students were infected.
  - o **.7%** of vaccinated students were infected.

### School Survey

- o Each year North Dakota Department of Health gathers school immunization rates.
- o Determines the percent of children attending school who are up to date on school required vaccines.
- o These rates are self reported by schools.
- o Participation by schools is mandatory.
- o North Dakota is required to report kindergarten results to the Centers for Disease Control (CDC.)

### Best Practices for Schools

- o Notify parents of the requirements for the upcoming school year in the spring prior.
- o Inform parents of missing immunizations before the start of summer vacation.
- o Assess students' vaccination status for the school year before the start of the school year.
- o Give parents 30 days to become compliant before enforcing exclusion.

## Importance of School Survey

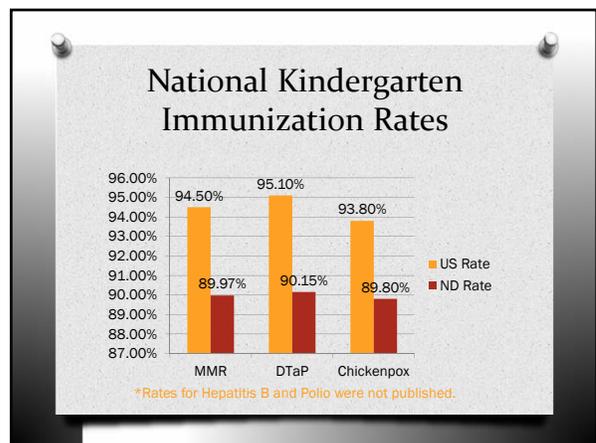
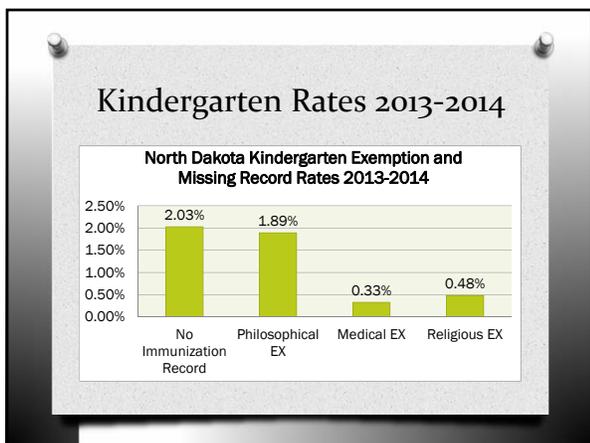
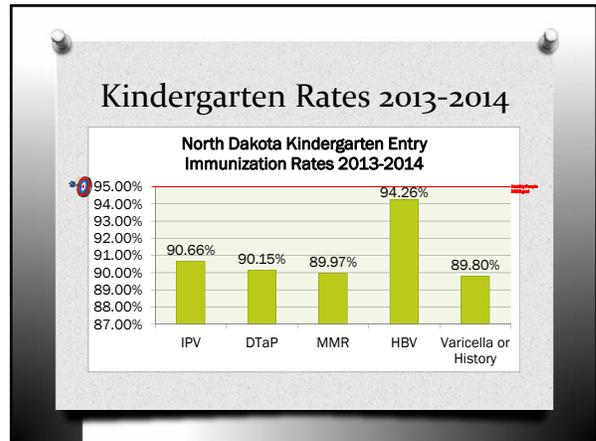
- o Gather patient-level vaccination data on children when they are most vulnerable for vaccine preventable diseases.
- o Provides overall picture of vaccination status among interacting children.
  - o May not be accurately assessed by looking at medical charts.
- o Includes children who may not have primary care provider, change providers frequently or have no contact with the primary care system.
- o Basis for policy, law and rule changes.

## Timeline

- o Early October: Send out letter to school administrators, school nurses, and health units notifying them of the survey and due date.
- o November: Survey is typically due mid-November
  - o Analyze results and calculate rates
    - o We can calculate school level data, county level data, and state level data.
- o January: Perform validation study
  - o Must validate data before reporting to CDC.
  - o Select sample of schools to examine records.
- o April: Data due to CDC 

## Methods

- o Online survey
  - o Must document number of children up-to-date for each required vaccine.
  - o Must document number of children who are exempt from requirements.
- o Schools given about 6 weeks to complete survey.

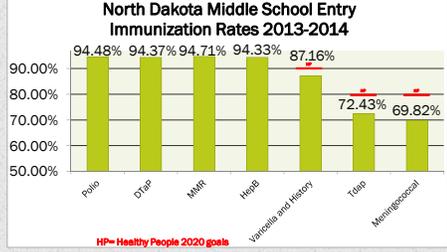
### National Kindergarten Immunization Rates

- North Dakota was the 5<sup>th</sup> worst in the nation for MMR coverage for the 2012-2013 school year.
- United States total exemption rate was 1.8%
- North Dakota's 2013-2014 kindergarten exemption rate is 2.7%



### Middle School Rates 2013-2014

#### North Dakota Middle School Entry Immunization Rates 2013-2014

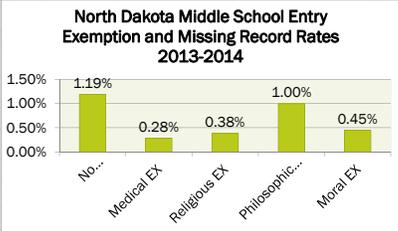


Immunization Type	Rate
Polio	94.48%
DTaP	94.37%
MMR	94.71%
HepB	94.33%
Varicella and History	87.16%
Tetap	72.43%
Meningococcal	69.82%

HP= Healthy People 2020 goals

### Middle School Rates 2013-2014

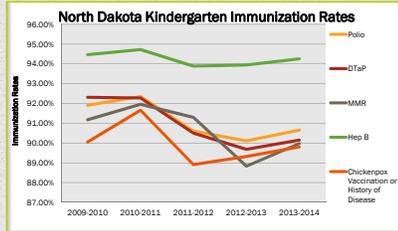
#### North Dakota Middle School Entry Exemption and Missing Record Rates 2013-2014



Category	Rate
No Record	1.19%
Medical Ex	0.28%
Religious Ex	0.38%
Philosophic or Moral Ex	1.00%
Moral Ex	0.45%

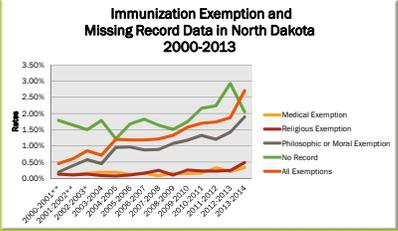
### Trends in North Dakota Kindergarten Rates

#### North Dakota Kindergarten Immunization Rates



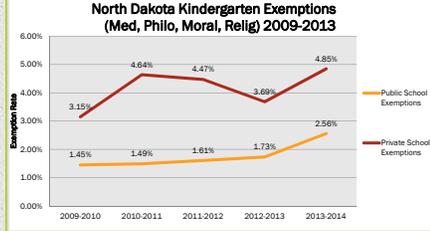
### Trends in North Dakota Kindergarten Rates

#### Immunization Exemption and Missing Record Data in North Dakota 2000-2013



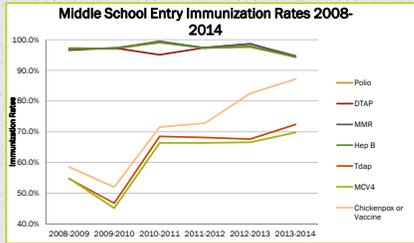
### Trends in North Dakota Exemption Rates

#### North Dakota Kindergarten Exemptions (Med, Philo, Moral, Relig) 2009-2013

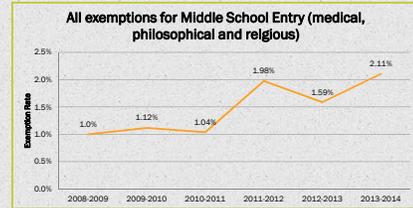


Year	Public School Exemptions	Private School Exemptions
2009-2010	1.45%	3.15%
2010-2011	1.49%	4.64%
2011-2012	1.61%	4.47%
2012-2013	1.73%	3.69%
2013-2014	2.56%	4.85%

### Trends in Middle School Rates



### Trends in Middle School Entry Exemption Rates 2008-2014



### New Initiatives to Increase Rates

- o Recall letter for children who will be entering kindergarten
- o Participate in Kindergarten Roundup
- o Yearly rates letters to schools with individual rates for the last 3 years
- o Immunization Rates for each county posted to our website along with state-level data



### Quality Improvement Project

- o The North Dakota Department of Health has undertaken increasing school immunization rates as a quality improvement project.
- o Goal is to increase the kindergarten immunization rates in the state.



### Vaccine Preventable Disease Outbreaks

- o Vaccine preventable diseases are not only dangerous but can result in prolonged absences.
  - o Children who get chickenpox must be excluded from school until all lesions have crusted over.
    - o This typically results in about a week of missed school.
  - o Outbreaks can also result in unvaccinated children being excluded.
  - o An outbreak of measles results in exclusion of unvaccinated individuals for at least 21 days after the last case of measles.

### Measles in U.S.

- o More cases of measles in the first 4 months of this year than the first 4 months of the past 18 years.
- o 154 cases in the U.S. in 2014 as of April 25.
- o 81% (134) were unvaccinated or had unknown status
- o 19%(20) vaccinated



## Measles Outbreaks

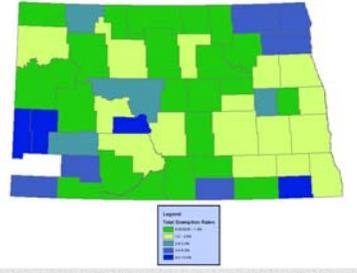
- o California has reported 59 cases of measles this year so far.
- o 43%(25) of these cases were unvaccinated.
- o 31% (18) had an unknown vaccination status.
- o 19% (11) were vaccinated and 4 cases had serologic proof of immunity.
- o Orange county experiencing an outbreak with 22 cases so far.



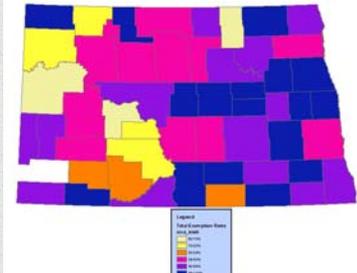
## Orange County

- o To prevent transmission of measles within a population, it is recommended that 95% of the population be vaccinated.
- o The 2013-2014 Kindergarten Assessment for California showed that statewide **92.33%** of Kindergartners were up to date with the MMR vaccine.
- o The personal belief exemption among kindergarteners was **3.15%**.
- o Orange county had a MMR coverage rate of **91.03%** with a personal belief exemption rate of **3.65%**.

## Philosophical Exemptions



## MMR Coverage



## Mumps

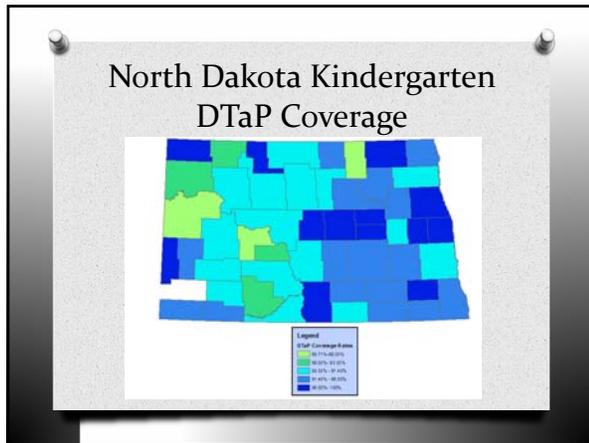
- o Outbreak at Ohio State University
- o So far 342 mumps cases have been reported in Ohio.
- o 201 of these cases have been linked to the University Outbreak.
- o 11 total hospitalizations.
- o Ages range from 9 months- 80 years.
- o MMR vaccine is not required for college entry in Ohio.



## Pertussis

- o San Diego County, California is currently experiencing a pertussis outbreak.
- o In 2014, the county has seen 337 cases.
- o Only had 56 cases at this time last year.
- o San Diego County's 2013-2014 Kindergarten DTaP coverage rate was 91.83% with Personal Belief Exemption rate of 4.49%





### Mandatory Reportable Vaccine Preventable Diseases

- o All mandatory reportable diseases should be reported to Disease Control within 7 days.
- o Certain diseases should be reported immediately.
- o Reporting can be done by:
  - o Calling 1(800)472-2180 or (701)328-2378
  - o Reporting online: <https://www.ndhealth.gov/disease/reportcard>

### Mandatory Reportable Vaccine Preventable Diseases

o Pertussis/Whooping Cough	o Tetanus
o Chickenpox	o Invasive <i>Streptococcus pneumoniae</i>
o Meningococcal disease	o Invasive <i>Haemophilus influenzae</i>
o Influenza	o Hepatitis A
o Measles	o Hepatitis B
o Mumps	o Polio
o Rubella	
o Diphtheria	

### School Located Influenza Vaccination Clinics

- o Several schools throughout North Dakota hold influenza vaccination clinics.
- o Nurses from Local Public Health Units and local clinics come to the schools.
- o Often the best way to reach children in rural areas.
- o Many times adults can be vaccinated there as well.

### Type your question in the chat window to the right.

This presentation will be posted to our website: [www.ndhealth.gov/immunize](http://www.ndhealth.gov/immunize)

After the presentation, questions may be sent to:

o Molly Howell	<a href="mailto:mahowell@nd.gov">mahowell@nd.gov</a>
o Abbi Pierce	<a href="mailto:apierce@nd.gov">apierce@nd.gov</a>
o Mary Woinarowicz	<a href="mailto:mary.woinarowicz@nd.gov">mary.woinarowicz@nd.gov</a>
o Amy Schwartz	<a href="mailto:amschwartz@nd.gov">amschwartz@nd.gov</a>
o Stacy Lovelace	<a href="mailto:slovelace@nd.gov">slovelace@nd.gov</a>
o Rahel Gemmeda	<a href="mailto:rgemmeda@nd.gov">rgemmeda@nd.gov</a>

o For any immunization questions, call 701-328-2378 for the Immunization Program

### Post-test

- o Nurses interested in continuing education credit, visit [www.ndhealth.gov/immunize/posttest/](http://www.ndhealth.gov/immunize/posttest/)
- o Successfully complete the five-question post-test to receive your certificate.
- o Credit for this session available until Wednesday, May 28th.

