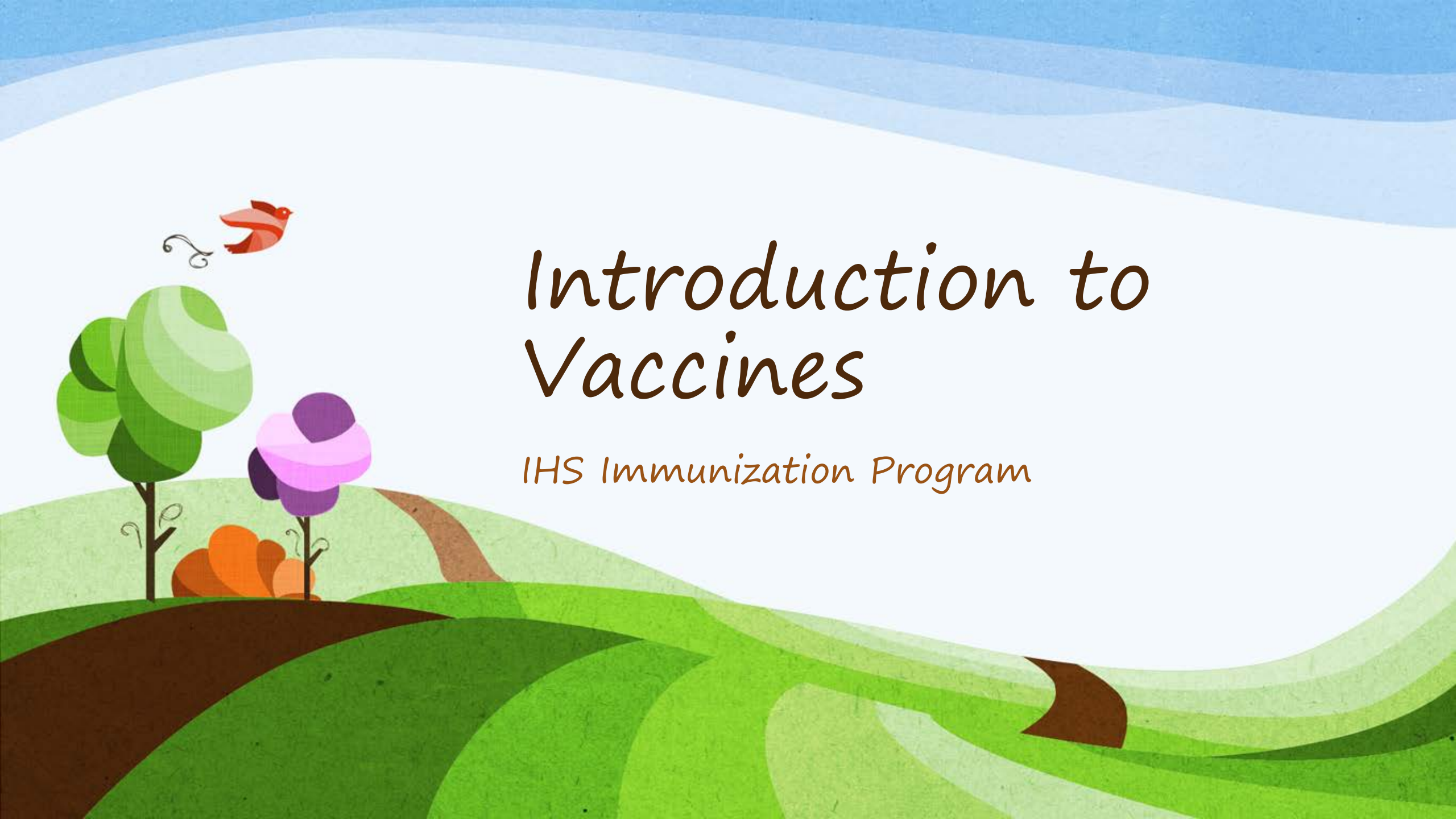


Introduction to Vaccines

IHS Immunization Program

Objectives

- Learn about Disease
- Understand how a vaccine works
- Learn about Immunity and Herd Immunity
- Know who needs vaccines
- Become familiar with common vaccine questions and answers
- Learn the role of CHRs in vaccine education

Disease

What is a disease?

- Changes to the normal functioning of your body
- Has certain signs and symptoms
- Caused by
  - The environment
  - Germs
  - Genes

Chronic Disease

- A disease that lasts for a long time
- Cannot be spread from person to person
- Examples
  - Heart Disease
  - Arthritis
  - Cancer
  - Obesity
  - Diabetes

Infectious Disease

- Can be spread
  - Directly from person to person
    - Coughing, sneezing, blood contact, mother to baby
  - Indirectly from an infected person to the environment
    - Toys, door handles, bedding and toilets
  - Animal/insect to person
- Examples
  - Flu
  - Measles
  - Pertussis (Whooping cough)

What is a vaccine preventable disease (VPD)?

- A vaccine preventable disease is an infectious disease for which an effective vaccine exists

Examples of VPDs

Anthrax, Cervical Cancer (HPV), Diptheria, Hepatitis A, Hepatitis B, Haemophilus influenza type b (Hib), Human Papillomavirus (HPV), Influenza (Flu), Japanese encephalitis (JE), Measles, Meningococcal, Mumps, Pertussis, Pneumococcal, Polio, Rabies, Rotavirus, Rubella, Shingles (Herpes Zoster), Smallpox, Tetanus, Typhoid, Tuberculosis (TB), Varicella (Chickenpox), Yellow Fever

How does a vaccine work?

Vaccine Basics

- Vaccines contain the same germs that cause disease
  - Germs are either weakened or killed so they can't make you sick. Some vaccines contain only a *part* of the disease germ.
- You cannot get the disease from the vaccine
- Vaccines help your body make antibodies
  - Antibodies act as guards and protect you from getting sick in the future

What is a vaccine and how does it work?

1. A weakened or killed form of the germ that causes the disease is injected into the body.

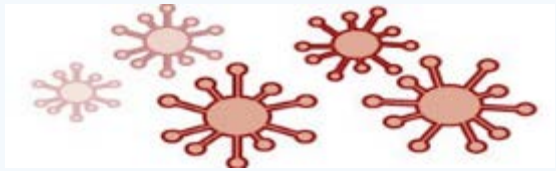
Weakened germ

Vaccine

2. The body creates antibodies to fight the germs.

Weakened germ

3. If the real germs ever attack the body, the antibodies recognize them and destroy them.



Actual germ

Immunity

What is it and how do we get it?

What is immunity?

- Protection from disease and infection
- The body's defense against germs
- NOVA PBS video: Immunity and Vaccines Explained
  - https://youtu.be/pOzWoetMkqQ

How do you get immunity?

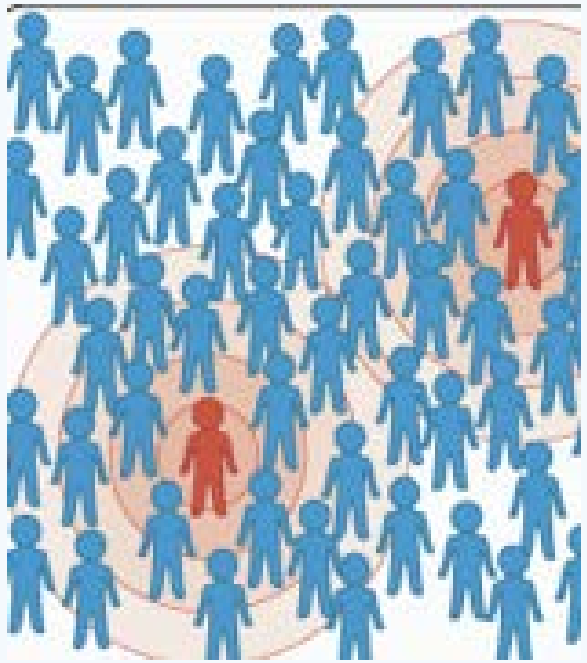
- Vaccine
- Mom → Baby
  - Pregnancy
  - Breast feeding
- Get the disease
  - Only some diseases and may not provide long lasting immunity
  - You cannot become immune to some diseases, like flu
    - If you get the flu one year, you can get it the next year

Herd Immunity Activity

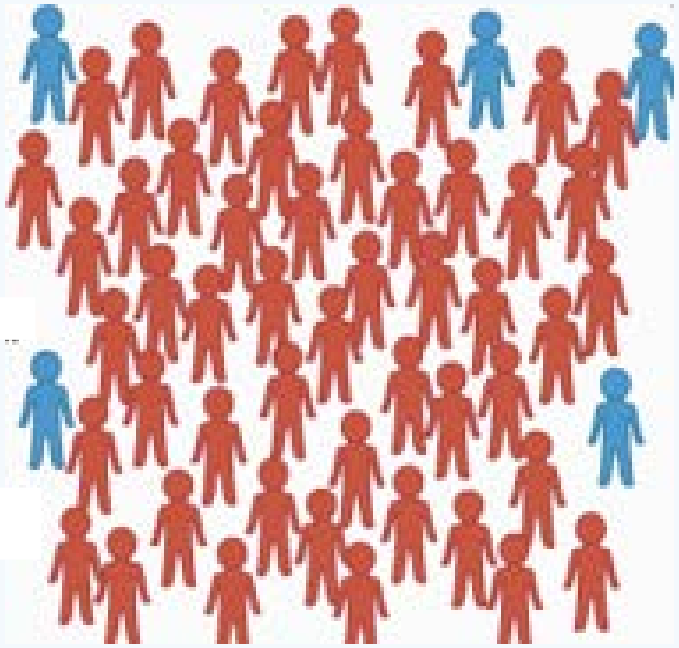
Herd Immunity: No One Immunized

= not immunized but still healthy

= not immunized, sick, and contagious



Contagious disease spreads throughout the community

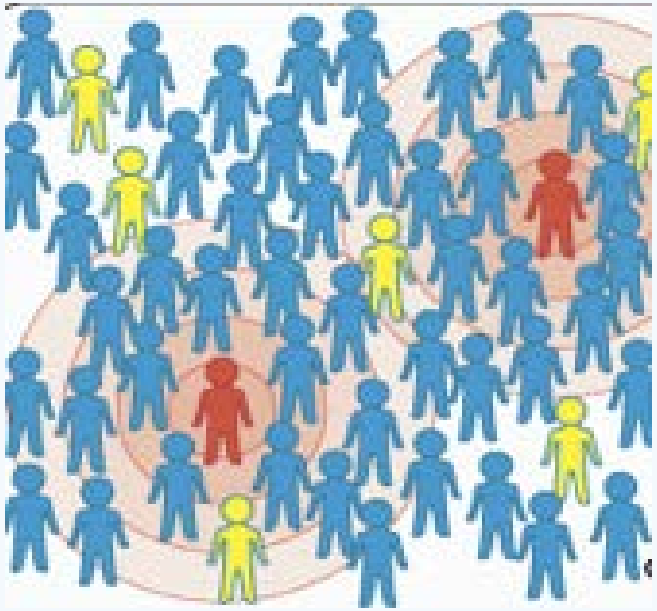


Herd Immunity: Some People Immunized

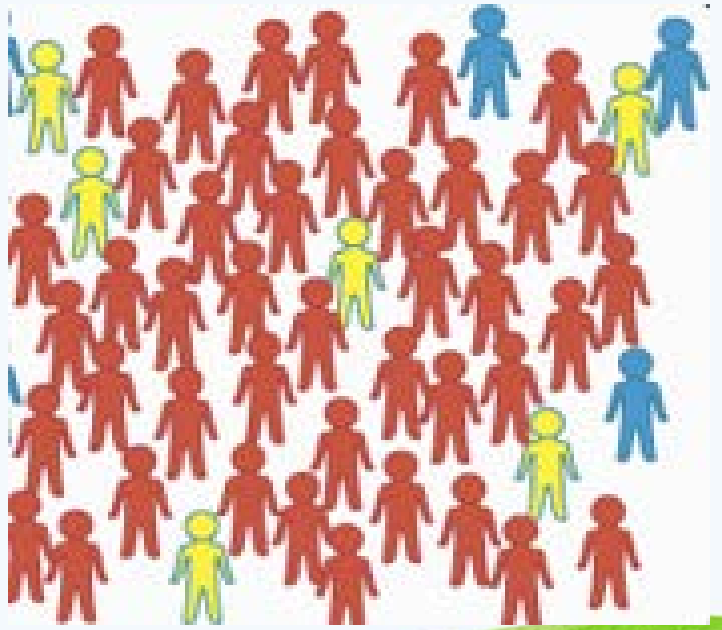
= not immunized but still healthy

= immunized and healthy

= not immunized, sick, and contagious



Contagious disease spreads throughout the community

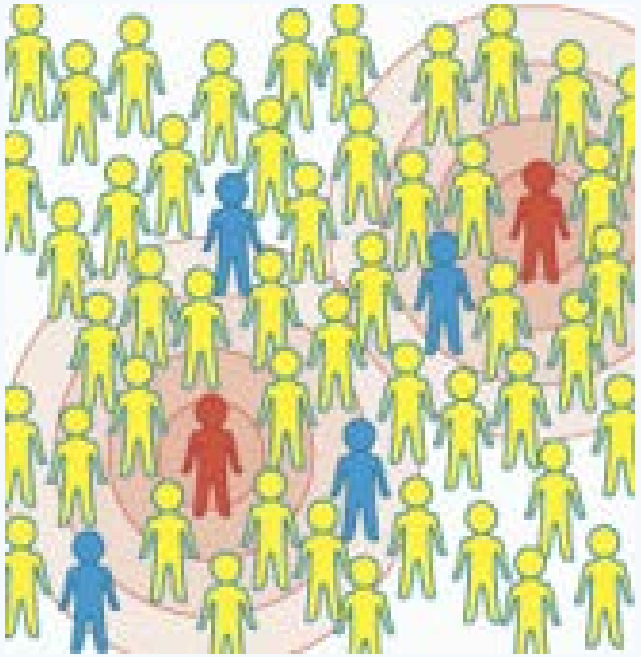


Herd Immunity: Most People Immunized

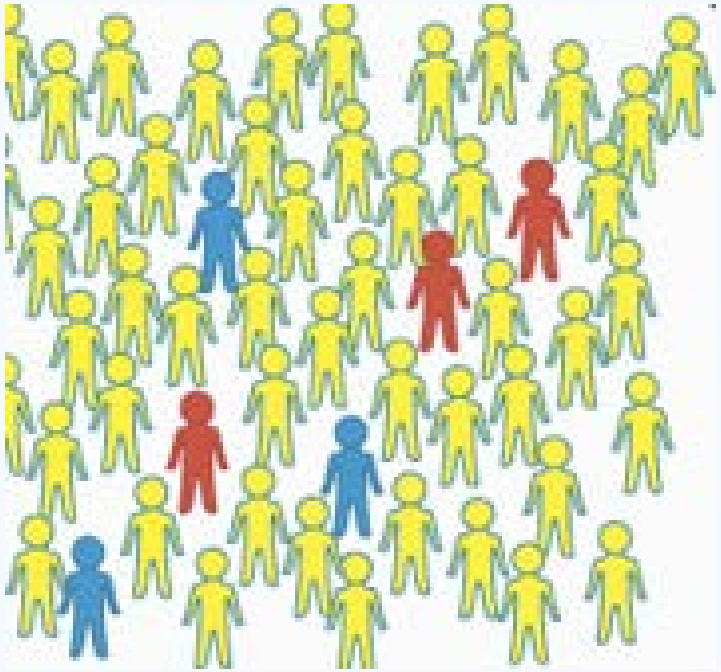
= not immunized but still healthy

= immunized and healthy

= not immunized, sick, and contagious



Contagious disease spreads throughout the community



Who do we protect when we get immunized?




Everyone!

Story about whooping cough

http://www.shotbyshot.org/stories/ramonas-story-video/

Why do we need vaccines?

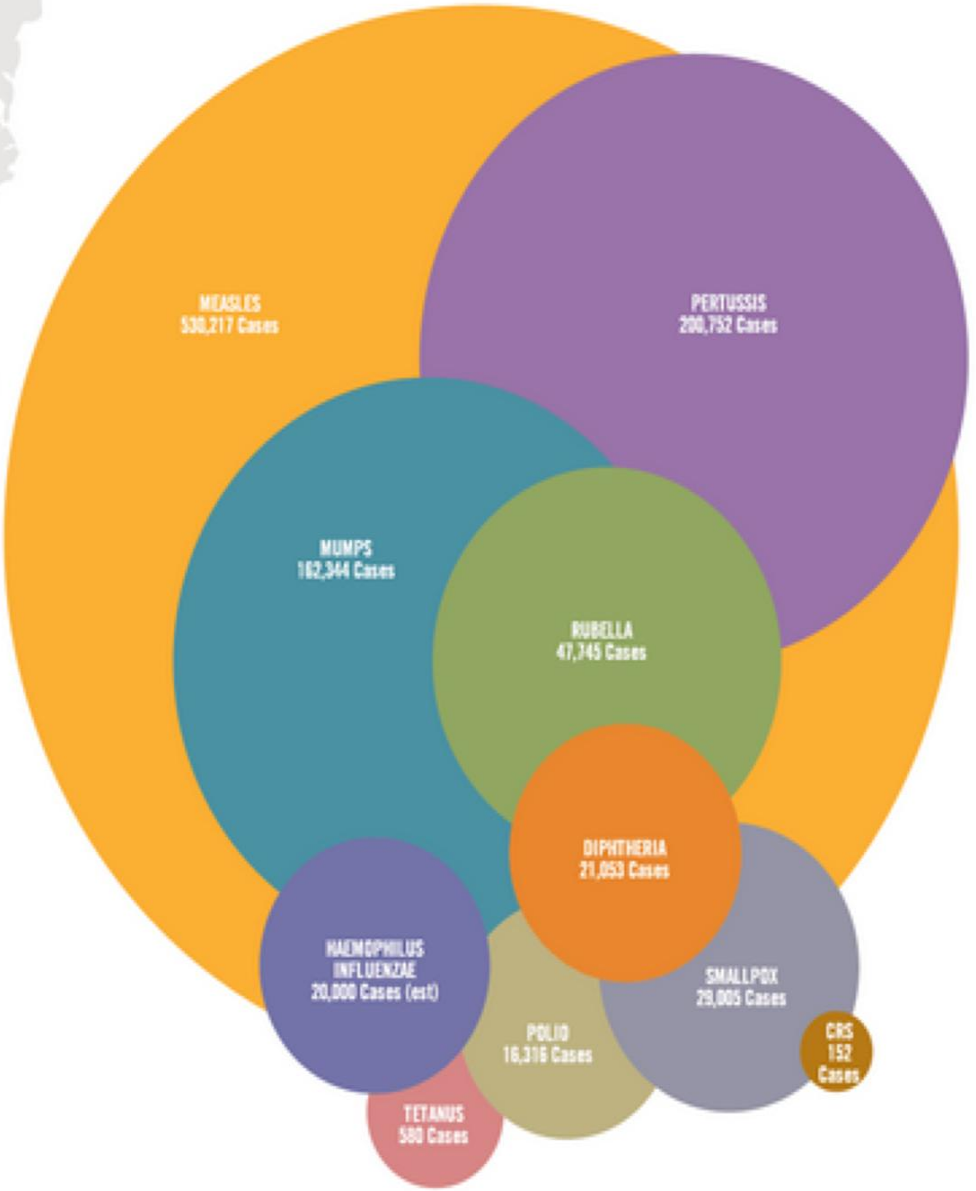
VACCINES WORK

These bubbles are sized according to the annual number of disease cases in the US during the 1900s versus 2010. We've come so far. It's a reminder that while disease rates are low, most diseases haven't disappeared. This is why we continue to vaccinate.

	THEN	NOW
SMALLPOX	29,005	0
DIPHTHERIA	21,053	0
PERTUSSIS	200,752	21,291
TETANUS	580	8
POLIO	16,316	0
MEASLES	530,217	61
MUMPS	162,344	2,528
RUBELLA	47,745	6
CRS	152	0
HAEMOPHILUS INFLUENZAE	20,000	270

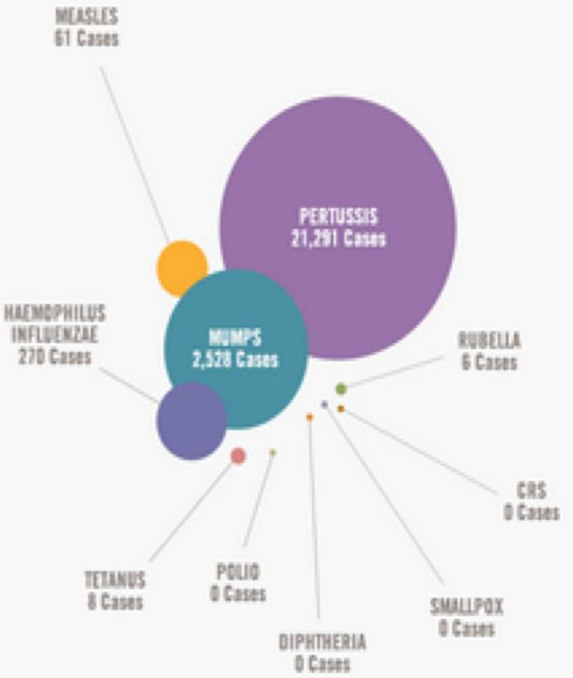
THEN

Annual US disease cases in the 1900s



NOW

US disease cases in 2010



[9] Centers for Disease Control and Prevention (CDC). Parents Guide to Childhood Immunizations. http://www.cdc.gov/vaccines/pubs/parents-guide/default.htm. Accessed August 15, 2011.
[10] CDC. Impact of Vaccines in the 20th & 21st Centuries. http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/G/impact-of-vaccines.pdf. Updated January 2011. Accessed August 15, 2011.

I never see these diseases anymore. Are they still around?

- Yes
- Some VPDs are still common in the US
  - Chickenpox, whooping cough, HPV
- Some parents choose not to vaccinate their children
  - Leaves many children and adults vulnerable to VPDs

HOME / HEALTH NEWS

Unvaccinated kids driving measles, pertussis outbreaks

Measles and whooping cough are highly contagious, and when fewer people are vaccinated, widespread protection known as herd immunity breaks down, giving these viruses free rein to spread.

By Steven Reinberg, HealthDay News | March 16, 2016 at 11:53 AM

Ohio Measles Outbreak Tied to Amish Missionaries

Kim Painter | *USA Today* | Thursday, May 15, 2014

Whooping cough outbreak sickens 10,000 in California

VPDs in other countries – who cares?

- Many VPDs are still common in other parts of the world
- Someone traveling to the U.S. from another country could spread the disease if no one is vaccinated
  - A few cases could become tens or hundreds or thousands if we stop vaccinating

Measles - Disneyland Outbreak (2014-2015)

- 147 cases of measles
- Majority of patients were unvaccinated or had an unknown vaccination status

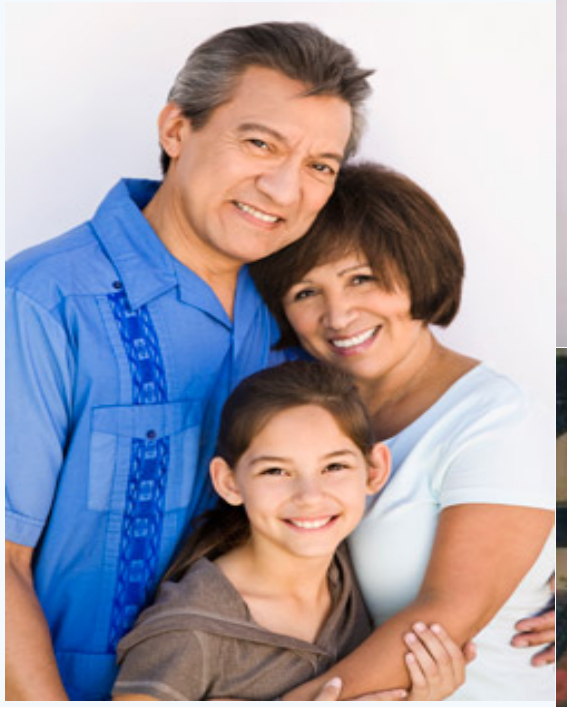
Why vaccinate?

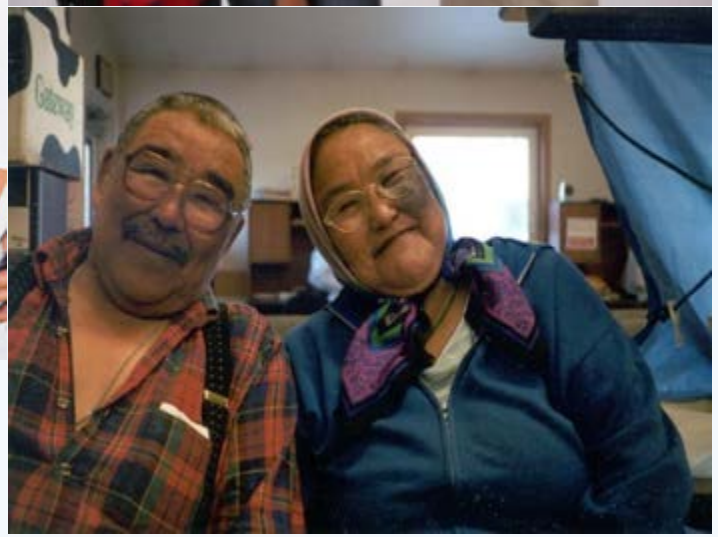
- Vaccines PREVENT Disease
- Diseases have not disappeared
- We need to keep immunizing until the disease is eradicated, or completely gone EVERYWHERE
  - Only one VPD, smallpox, has been completely eradicated
- By getting vaccinated, we can protect ourselves AND others around us

Who needs vaccines?

Everyone Needs Vaccines

- Babies
- Children
- Adolescents
- Adults
  - Including healthy adults
- Elders
- Pregnant Women
- Children and Adults with certain health conditions





Vaccine Schedules

- There is a recommended vaccine schedule for every age group
- The schedule includes
  - Timing of all recommended vaccines
  - Number of vaccine doses recommended

Healthcare Personnel (HCP)

- HCP is anyone that works in or with a healthcare facility
  - CHRs – in contact with vulnerable patients
- Certain vaccines are recommended for HCP
  - Flu (every year)
  - There may be other vaccines you need
- By getting vaccinated you protect yourself **AND** your patients

Common Vaccine Questions

and How to answer them

Are vaccines safe?

- YES! Vaccines are safe.
- Like all medications, there may be side effects.
  - Most side effects are minor and go away within a few days
    - Ex. Low grade fever or sore arm
  - Serious side effects are very rare
- There are systems to monitor vaccine safety
  - Doctors, nurses and patients can report any side effects experienced after receiving a vaccine

Do vaccines cause autism?

- NO
- There is no a link between Autism Spectrum Disorder (ASD) and vaccines
- Vaccine ingredients do not cause autism
  - Thimerosal is a preservative used in some vaccines
    - Used to prevent contamination in multidose vaccines
  - The type of mercury in thimerosal is different than the type of mercury contained in fish that can cause damage at high levels
  - There is no link between thimerosal and autism

Is it okay to receive multiple vaccines during the same visit?

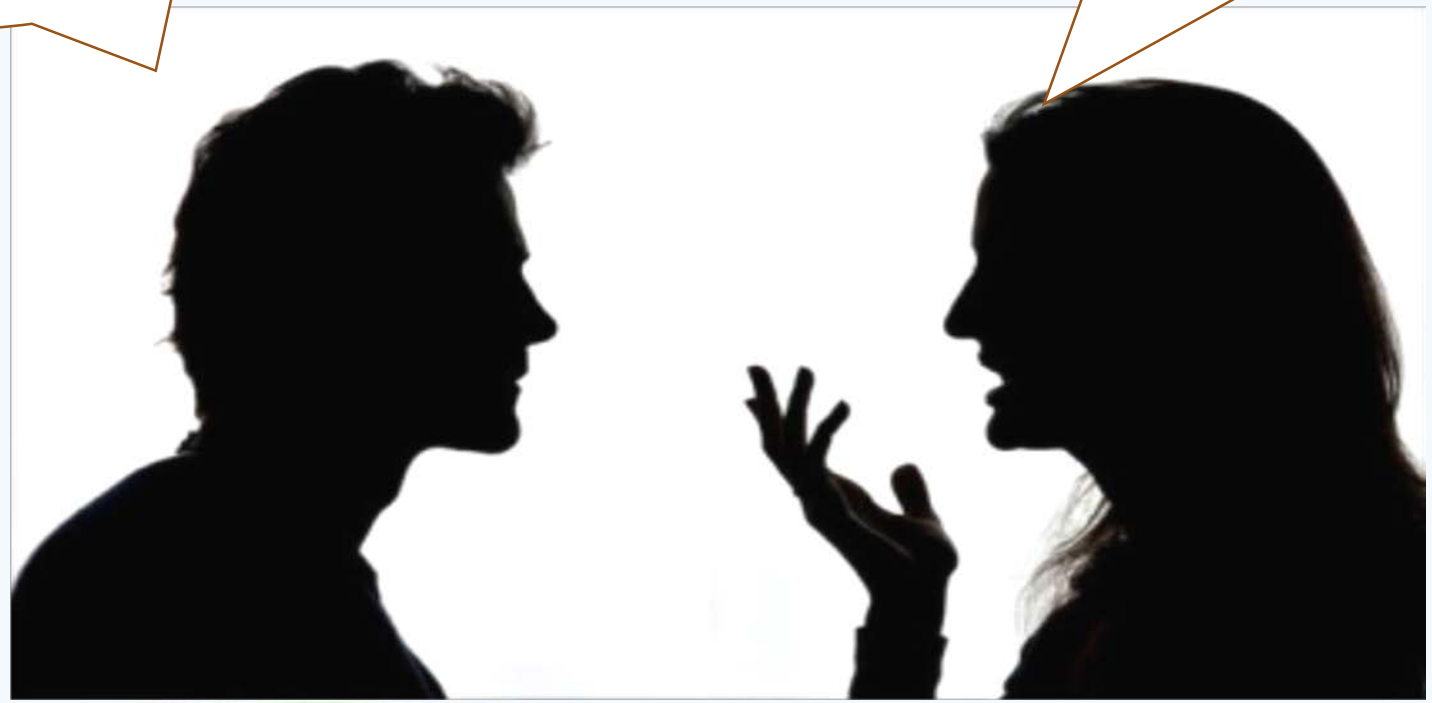
- YES!
- The vaccine schedule is designed to provide maximum protection
  - Babies most at risk
- Everyone should get all their shots according to the recommended schedule
  - Ensures protection from the diseases as soon as possible
  - It is safe to get multiple vaccines during the same visit

I am healthy so I don't need any vaccines, right?

Even if you are healthy, you still need vaccines! Ask your healthcare provider about which ones are right for you.

Why do I always get sick after I get a vaccine?

You cannot get the disease from the vaccine. But your body is going through the process of creating antibodies (the guards that protect you). This process may make you feel a little sick, but it is better than getting the actual disease!



The Role of CHRs

The Role of CHRs

- Educate your patient/clients on the importance of vaccines
- Encourage them to talk with a healthcare provider about which vaccines they may need
- Be an example! Make sure you have received all your recommended vaccines

Evaluation of materials

Flu vaccine PSA

- https://youtu.be/TN77u-KXZzY

Adult Immunization PSA

- https://www.youtube.com/watch?v=ZUxP6D7PbvQ&feature=youtu.be

Companion Materials for CHRs
Vaccine Basics

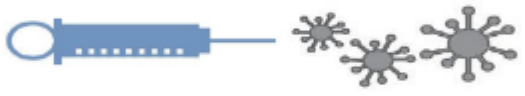
Adult Vaccine Basics

How do vaccines prevent diseases?

Vaccines work with your body to safely develop immunity, or protection against disease, without making you sick. Vaccines help your body make antibodies. Antibodies act as guards and protect you from getting sick in the future. The antibodies are constantly on the lookout for real world germs. If they come across one they sound the alarm for your body to go on the defense and attack the germs right away. So when the real germ shows up, your body will recognize it and create a shield of protection (immunity).

Here's how it works:
Vaccines help to protect you by working with your body to safely develop immunity to disease without making you sick.

1. Weakened or killed forms of the germs that cause disease are injected into the body.



Vaccine

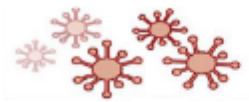
Weakened Germ

2. The body creates antibodies to fight the weakened germ.

Antibodies

Weakened Germ

3. If full-strength germs ever attack the body, the antibodies are there to destroy them.



Full-Strength Germs

Antibodies Recognize the Germ

Antibodies Destroy the Full-Strength Germ

Why do adults need vaccines?

- Some adults were never vaccinated as children.
- Certain vaccines were not available when some adults were children.
- The protection against disease created by vaccines (immunity) can begin to fade over time.
- As we age, we become more likely to get serious disease caused by common infections like the flu.
- Vaccines help prevent the spread of disease to other people.

Are vaccines safe?

Yes. Vaccines are one of the safest ways to protect your health.

Some adults may not be able to get certain vaccines due to preexisting health conditions. Check with your doctor or other provider about which vaccines are right for you.

Can you get sick from a vaccine?

You can get mild side effects, such as a fever, from the vaccine. These symptoms are a normal part of the body's process of building immunity, and are typically both mild and temporary. They are less serious than getting the real disease, or spreading the disease to others who may be more vulnerable like babies too young to get vaccines.

What are the possible side effects of vaccines?

Like any medication, vaccines can cause side effects. The most common are mild and go away within a few days. Serious side effects following vaccination, which are usually due to an allergic reaction, are very rare, and doctors and clinical staff are trained to deal with them.

Can vaccines cause Autism?

There is no link between vaccines and autism. Vaccine ingredients do not cause autism.
For more information, visit http://www.cdc.gov/vaccinesafety/concerns/autism.html

(Adapted from: CDC, "Understanding How Vaccines Work", 2013;
Children's Hospital of Philadelphia & AMA, "Vaccines and Adults", 2013, Children's Immunization Coalition of CO;
MLive.com, "How do vaccines work? The science of immunizations", 2014)

Companion Materials for CHRs
Adult Vaccine Guide

Vaccines for Adults

	Who	When	Why	How well does it work?
Influenza (Flu)	Everyone 6 months and older	One dose every year	Influenza is a virus spread by coughing and sneezing. Influenza causes fever, aches, runny nose, and coughing. Influenza is serious – many people are hospitalized each year and some die after being infected.	How well the vaccine works depends on how well the vaccine matches the flu viruses that are spreading in the community.
Tdap/Td	Everyone	Tdap: At least once during one's lifetime Td: Every 10 years	The Tdap/Td vaccine protects against three or two diseases: • Tetanus: A bacterium that enters the skin through a cut or puncture, and causes "lockjaw". • Diphtheria: A bacterium that is spread by coughing or sneezing, and causes breathing problems. • Pertussis or "whooping cough": A bacterium spread by coughing or sneezing, which causes severe coughing in children, adolescents, and adults and can lead to death in babies.	Rates of tetanus and diphtheria have dropped by 99% and rates of pertussis by 80% since the vaccine became available.
	Pregnant Women	Tdap: Every pregnancy Preferred timing: between weeks 27 and 36 of each pregnancy (though can be given at any time)		
Zoster (Shingles)	Everyone 60 years and older	Once during one's lifetime	Shingles is caused by varicella zoster, or chickenpox virus. Anyone who has had chickenpox can get shingles. Shingles causes a very painful rash with blisters that can continue for months or even years.	The vaccine has been shown to reduce the risk of shingles by 50% and the likelihood of lingering nerve pain by 65%.
Pneumococcal	Everyone 65 years and older	One dose each of: 1. PCV13 (conjugate) 2. PPSV23 (polysaccharide), 12 months after PCV13	*Streptococcal pneumoniae* is a bacterium that is spread by coughing or sneezing. The bacterium causes pneumococcal disease, which can lead to serious lung, blood, and/or brain infections. There are two different types of pneumococcal vaccines which protect against the virus in different ways.	PCV13 is 75% effective in preventing invasive (blood and brain) disease and 45% effective in preventing pneumonia. PPSV23 is 50% to 85% effective in preventing invasive disease.
	People younger than 65 years who have certain medical conditions. Check with your healthcare provider.	1 dose of PPSV23 and/or PCV13		
HPV	Women 26 years and younger Men 21 years and younger Men 22 to 26 years with certain risk factors; check with your healthcare provider	Two or three doses over six months	HPV is a virus spread through any intimate contact. HPV causes genital warts and can lead to cervical and other oral and genital cancers in men and women. HPV is the most common sexually transmitted infection in the U.S.	The vaccine has been shown to provide close to 100% protection against pre-cancers and genital warts caused by HPV.
Hepatitis A	Those who: 1) want to protect themselves from Hepatitis A; 2) may be exposed to Hepatitis A in their work; 3) are traveling to an area where Hepatitis A is common; 4) are men who have sex with men (MSM); 5) use injection drugs and share needles; and/or 6) have chronic liver disease.	Two doses 6 months apart	Hepatitis A is a virus that is spread through contact with the feces (poop) of infected people. Hepatitis A causes an infection in the liver that can make you very sick and cause skin and *eyes* to turn yellow. Hepatitis A can lead to death, especially in those with chronic liver disease.	Hepatitis A rates have declined 95% since the vaccine became available.
Hepatitis B	Those who: 1) want to protect themselves from Hepatitis B; 2) may be exposed to Hepatitis B in their work or at home; 3) are traveling to an area where Hepatitis B is common; 4) have sex with one or more partner; 5) have chronic liver disease; 6) have diabetes; 7) are on dialysis; 8) are men who have sex with men (MSM); 9) use injection drugs and share needles; 10) have an HIV infection; 11) have a sexually-transmitted infection, and/or 12) are a prisoner in a correctional facility.	3 doses over 6 months	Hepatitis B is a virus that is spread through contact with the blood and/or bodily fluids of an infected person. Hepatitis B causes an infection in the liver that can lead to liver failure or cancer.	Hepatitis B rates have declined 81% since the vaccine became available.

Tdap – Tetanus, Diphtheria, Pertussis; Td – Tetanus, Diphtheria; PCV13 – Pneumococcal 13-valent conjugate; PPSV23 – Pneumococcal 23-valent polysaccharide; HPV – Human Papillomavirus

Adapted from materials developed by: 1) Immunization Action Coalition; 2) Children's Hospital of Philadelphia & AMA, "Vaccines and Adults", 2015; 3) CDC and vdc.gov

Vaccines adults may need based upon existing health conditions, lifestyle, or job

This chart shows some common vaccines for adults with certain health conditions and lifestyles, but there may be other vaccines you need.

Talk to your healthcare provider for more information.

	Hepatitis A	Hepatitis B	HPV	Hib	Meningococcal: MenACWY Or MPSV4	Meningococcal: MenB	Pneumococcal: PPSV23	Pneumococcal: PCV13 + PPSV23
Chronic Alcoholism							•	
Chronic kidney disease or kidney failure		•					•	•
Chronic liver disease	•	•					•	
Chronic lung disease (e.g. COPD or asthma)							•	
Diabetes Type 1 or 2		•					•	
Heart Disease							•	
HIV		•	•	•			•	•
Men who have sex with men (MSM)	•	•	•				•	
No spleen or spleen does not work well				•	•	•	•	•
People living in residence halls (e.g. dorms)					•	•		
Weakened immune system				•			•	•

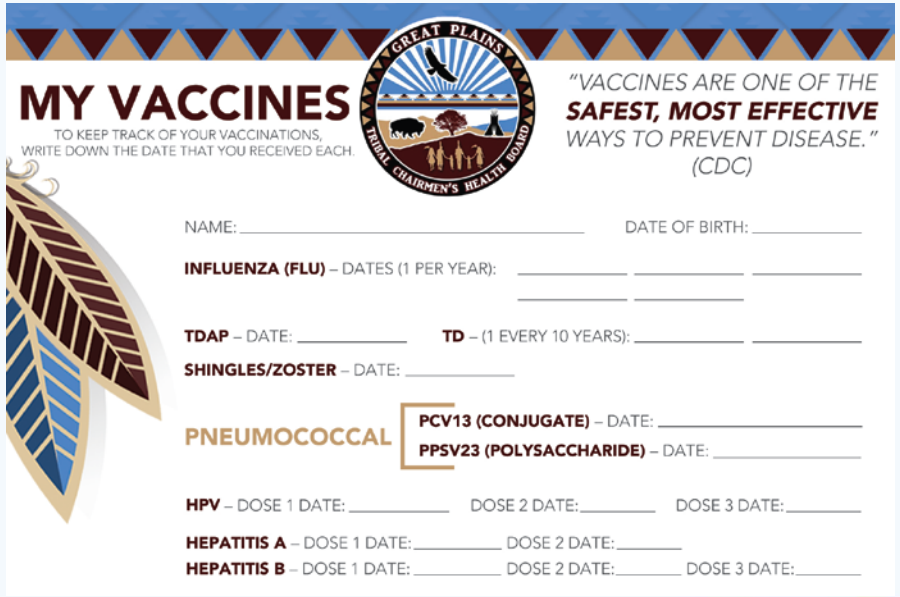
HPV – Human Papillomavirus; Hib – Haemophilus influenzae type b; MenACWY – Meningococcal 4-valent conjugate; MPSV4 – Meningococcal 4-valent polysaccharide; MenB – Meningococcal B; PPSV23 – Pneumococcal 23-valent polysaccharide; PCV13 – Pneumococcal 13-valent conjugate

(Adapted from CDC's "Vaccines. Know What You Need")

Community Educational Materials

- Video PSAs, Radio PSA, posters, companion material, vaccine card

- Visit Great Plains Tribal Chairman's Health Board website
  - http://nptec.gptchb.org/infectious-disease/national-vaccination-project/
  - Resources → Infectious Disease → National Vaccination Project



Resources

- Immunization Schedules
  - http://www.cdc.gov/vaccines/schedules/index.html
- Immunization Action Coalition
  - www.immunize.org
- Stories from people who have experienced vaccine-preventable diseases
  - http://www.vaccineinformation.org/personal-testimonies/

Thank You!

- Amy Groom, IHS Immunization Program Manager
- Amy.Groom@ihs.gov

- Cheyenne Jim, IHS Immunization Program Analyst
- Cheyenne.Jim@ihs.gov

- Jillian Doss-Walker, Public Health Advisor
- Jdosswalker@cdc.gov