



## Risk of Disease vs Risk from Vaccines

### Natural Disease

### Vaccine Adverse Reactions

#### Measles

- Ear infection: 5 in 100 cases
- Pneumonia: 6 in 100 cases
- Encephalitis (Brain Infection): 1 in 1,000 cases with 1 in 4 having permanent neurologic damage.
- Acute Disseminated Encephalomyelitis: 1 in 1,000 cases with 10% of those cases resulting in death.
- Subacute sclerosing panencephalitis (fatal progressive degenerative disease of the brain that usually occurs 7-10 years after infection): 1 in 1,300 cases
- Overall Death Rate: 1 in 500 cases
- Loss of antibody memory to fight past contracted infections!!!

#### MMR (Measles Mumps Rubella) Vaccine

- Fever: 10 in 100 cases
- Rash: 5 in 100 cases
- Febrile seizure: 1 in 3,000 cases
- Immune Thrombocytopenia: 2 in 100,000 cases (similar to the number of cases in the general population).
- Encephalitis or severe allergic reaction: 1 in 1,000,000 (same as general population)
- Subacute sclerosing panencephalitis: 7 in 10,000,000 (likely patients actually had measles prior to vaccination)

#### Mumps

- Orchitis (swollen testicles) 15-30 in 100 cases
- Meningitis 1 in 100 cases
- Encephalitis 1 in 6000 cases

#### Rubella

- Congenital Rubella Syndrome (infant develops hearing loss, mental retardation, heart defects, eye defects) occurs from infection during pregnancy: 1 in 4 cases
- Encephalitis: 1 in 6,000 cases



<p><b>Diphtheria</b></p> <ul style="list-style-type: none"> <li>● Heart inflammation: 30 in 100 cases.</li> <li>● Neurologic toxicities 5 in 100 cases.</li> <li>● Death: 1 in 20</li> </ul>	<p><b>DTaP Vaccine</b> (Diphtheria, Tetanus, Pertussis)</p> <ul style="list-style-type: none"> <li>● Extensive limb swelling 2 in 100 cases.</li> <li>● High fever &gt;105 1 in 16,000 cases.</li> <li>● Continuous crying &gt;3 hours 1 in 1,000 and decreased responsiveness 1 in 10,000</li> <li>● Acute encephalopathy: 0-10 in 1,000,000</li> </ul>
<p><b>Tetanus</b></p> <ul style="list-style-type: none"> <li>● Intensely painful muscle spasms</li> <li>● Death: 8-50 in 100 cases in resource-limited countries. Most recover with modern supportive care.</li> </ul>	
<p><b>Pertussis</b> (Infants &lt;1 y/o with Pertussis)</p> <ul style="list-style-type: none"> <li>● &gt;50% need to be hospitalized</li> <li>● Pneumonia: 1 in 5</li> <li>● Seizures: 1 in 100</li> <li>● Death: 1 in 100</li> </ul>	
<p><b>Hemophilus influenza type B (HiB)</b></p> <ul style="list-style-type: none"> <li>● Deaths: 1000 per year prior to vaccine</li> <li>● 20,000 cases/year prior to vaccine</li> <li>● 15-30% of patients have complications (blindness, deafness, mental retardation)</li> </ul>	<p><b>HiB Vaccine</b></p> <ul style="list-style-type: none"> <li>● Redness, swelling at injection site: 1 in 4</li> <li>● Fever 1 in 20</li> </ul>
<p><b>Varicella (Chicken Pox)</b></p> <ul style="list-style-type: none"> <li>● Acute cerebellar ataxia 1 in 4,000 cases in children</li> <li>● Encephalitis in adults rarely. Pneumonia in adults 60 in 10,000 cases</li> <li>● 12,000 people were hospitalized/year</li> <li>● Deaths: 100 per year prior to vaccines</li> </ul>	<p><b>Varicella Vaccine</b></p> <ul style="list-style-type: none"> <li>● Fever: 1 in 10</li> <li>● Mild Rash: 1 in 20</li> <li>● Seizure from fever: less than 1 in 1,000</li> <li>● Pneumonia – very rare</li> </ul>
<p><b>Rotavirus</b></p> <ul style="list-style-type: none"> <li>● USA before the vaccine -3 million cases of diarrhea per year -80,000 hospitalizations per year -20-40 deaths per year</li> <li>● After vaccine introduction in 2006 -Hospitalizations decreased by 70%!</li> </ul>	<p><b>Rotavirus Vaccine</b></p> <ul style="list-style-type: none"> <li>● Possible increased risk of intussusception 1 in 100,000 cases</li> </ul>
<p><b>Human papillomavirus (HPV)</b></p> <ul style="list-style-type: none"> <li>● 530,000 cases of invasive cervical carcinoma and 260,000 cervical cancer deaths per year</li> <li>● HPV causes 90% of anal and genital warts</li> </ul>	<p><b>HPV Vaccine</b></p> <ul style="list-style-type: none"> <li>● Anaphylaxis 1 in 1,000,000 cases</li> </ul> <p>Sources:  <a href="http://pediatrics.about.com">http://pediatrics.about.com</a>, <a href="http://www.aap.org">http://www.aap.org</a>  <a href="http://www.cdc.gov">http://www.cdc.gov</a>, UpToDate 4/14/2020</p>



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