

1. You are preparing a picnic and want to make sure the foods are safe for consumption. Describe (1) what you do to minimize bacterial contamination and growth, and (2) list three pathogens that could cause food poisoning.

My answer:

- Clean well and no cross-contamination by separating meat from vegetables/fruits
- Cook at right temperatures and keep food cold (again, right temperature)
- Staph: onset after ingestion (1 to 6 hours), nausea, vomiting, lasting 24-48 hours, improperly treated frozen meat
- E-coli: onset 1-8 days, severe diarrhea, lasts 5-10 days, from raw/contaminated food
- Salmonella: onset 1-3 days, diarrhea, fever, abdominal cramps, lasts 4-7 days, eggs, contaminated fruit/vegetables

2. You are describing smallpox to someone who has never heard of the disease. Describe how the disease was eradicated, including (1) the symptoms associated with Smallpox (why it was so bad), (2) what variolation (inoculation) was, (3) how Edward Jenner developed a vaccine, and (4) how the disease was finally eliminated in the 1970s.

My answer:

- Symptoms: fever, fatigue, lots of pus left lots of wounds because of scarring
- Treatment: variolation (inoculation) 8th century
 - Purposefully giving people smallpox from people with variola minor
 - Risks: could give variola major
- Edward Jenner: 18th century
 - Heard that maids who milked cows with cowpox did not get smallpox
 - Testing: gave a boy small amount of cowpox then gave him variola major
 - Now known as vaccine: this was because the body created memory T and B cells | antigens of cowpox and smallpox are very similar
- World Health Organization (WHO): declared war on smallpox
 - Smallpox declared eradicated in 1980s
 - Lab worker infected in 1978: smallpox could stay in containers (hint at biological weapons)

3. Explain why polio has not been eliminated yet, and add your own opinion on whether these issues may impact COVID-19 now that a vaccine is available.

My answer: Aside from people personally not wanting to take vaccinations, Polio persists in 3 countries: Pakistan, Afghanistan, Nigeria. Pakistan and Afghanistan in particular because of the difficulty in getting healthcare workers into areas that are dangerous.

Since the COVID vaccine is introduced, I believe that the medical focus, or trend, would be to prioritize COVID vaccines over polio vaccines.

4. You have a friend who is reluctant to get this year's flu vaccine because they, like many people, do not like shots. Explain why it is important to regularly get the flu vaccine, for your friend individually, and also for society in general.

My answer: Getting a vaccine means administering an antigen where the body makes memory cells against it, and if pathogen attacks, memory cells recognize it and make quick work. The biggest point of vaccines is for the greater population, stemming from herd mentality. Some people can not be immunized because they are too young, too ill, or have a compromised immune system. If everyone else is vaccinated, this provides "herd immunity" that protects the most vulnerable people from being exposed to the pathogen.