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Unit: CRISIS

Lesson: **Public Health in the Sprawl**

Answer Key: Health Issues

Malaria

- Definition: A parasitic disease characterized by fever, chills, and anemia.
- Causes: Malaria is caused by a parasite that is transmitted from one human to another by the bite of infected mosquitoes. In humans, the parasites migrate to the liver where they mature and release another form. These enter the bloodstream and infect the red blood cells. The parasites multiply inside the red blood cells, which then rupture within 48 to 72 hours, infecting more red blood cells. The symptoms occur in cycles of 48 to 72 hours. Malaria can also be transmitted congenitally (from a mother to her unborn baby) and by blood transfusions. Malaria can be carried by mosquitoes in temperate climates, but the parasite disappears over the winter.
- Effects & Symptoms: The disease is a major health problem in much of the tropics and subtropics. More than 200 million people in the world have malaria. It presents the greatest disease hazard for travelers to warm climates. Falciparum malaria, one of four different types, can be fatal within a few hours of the first symptoms. Symptoms include: chills, fever, headache, nausea and vomiting, muscle pain, anemia, bloody stools, and jaundice.
- Treatment and Prevention: Malaria, especially Falciparum malaria, is a medical emergency requiring hospitalization. Chloroquine is the most frequently used antimalarial medication. Most people living in malaria-prevalent areas have acquired some immunity to the disease. In some areas of the world, mosquitoes that carry malaria have developed resistance to insecticides, while the parasites have developed resistance to antibiotics. This has led to difficulty in controlling both the rate of infection and spread of this disease.

Malnutrition (especially of children and mothers)

- Definition: A general term that indicates a lack of some or all nutritional elements. Causes: Malnutrition is caused by inadequate intake or inadequate digestion of nutrients.
- This can occur because of deficiencies in the diet. Single vitamin deficiencies are a form of malnutrition just as starvation is a form of malnutrition. Malnutrition can also occur when nutrients are adequately consumed in the diet, but one or more nutrients are not digested or absorbed properly.
- Effects & Symptoms: Malnutrition may be mild enough to show no symptoms or so severe that the damage it has done is irreversible even though the individual may be kept alive. Worldwide, malnutrition continues to be a significant problem, especially among children who cannot fend adequately for themselves. Symptoms vary based on kind of nutrition deficiency but include weakened heart, psychosis, fatigue, abdominal pain, numbness in limbs, shortness of breath, diarrhea, skin sores, loss of hair, and growth failure.
- Treatment & Prevention: Treatment usually consists of replacement of missing nutrients; and treatment of symptoms as necessary. Eating a good, well-balanced diet helps to prevent most forms of malnutrition. In infants, the breast milk of a healthy mother is the best source of nutrients possible.

HIV/AIDS

- Definition: a fatal transmissible disorder of the immune system.
- Causes: The Human Immunodeficiency Virus (HIV) causes AIDS. AIDS is the final and most serious stage of HIV disease. The virus attacks the immune system and leaves the body vulnerable to a variety of life-threatening illnesses.

Common bacteria, yeast, and viruses that would not cause disease in people with a fully functional immune system often cause these illnesses. HIV has been found in saliva, tears, nervous system tissue, blood, semen, breast milk, and female genital tract secretions. Transmission of the virus occurs: 1) through sexual contact including oral, vaginal, and anal sex, 2) through blood via blood transfusions or needle sharing, 3) from mother to child: when a woman is pregnant, she can passively transmit the virus to her fetus or a nursing mother can transmit it to her baby. Other transmission methods are rare and include accidental needle injury, artificial insemination through donated semen, and organ transplantation through the donated organ.

- **Effects & Symptoms:** Since the onset of the HIV/AIDS epidemic 15 years ago, the virus has infected more than 47 million people in the world. With more than 2.2 million deaths in 1998, HIV/AIDS has now become the fourth leading cause of mortality and its impact is going to increase. Over 95% of all cases and 95% of AIDS deaths occur in the developing world, mostly among young adults and increasingly in women. In East Africa, between one of every seven to one of every nine adults is infected in most countries. Symptoms of AIDS are primarily the result of infections that do not normally develop in individuals with healthy immune systems. These infections are termed opportunistic infections. The general symptoms associated with most infections are fevers, sweats, chills weakness, and weight loss. Initial infection may produce no symptoms. Some people with HIV infection remain without symptoms for years between the time of exposure and development of AIDS.
- **Treatment & Prevention:** No vaccine or cure has yet been developed that can prevent HIV infection. Therapy was initially limited to treatment of the individual opportunistic infections as they arose. However, several drugs, such as AZT, 3TC, and dideoxyinosine are now used to slow the development of AIDS once an individual has become infected with HIV. These drugs target the reverse transcriptase enzyme, inhibiting its activity and thereby curbing reproduction of the virus. A new class of pharmaceuticals, called protease inhibitors, has been developed that shows promise in combating HIV. These compounds prevent the final processing of a number of important HIV proteins carried out by the enzyme HIV protease. Protease inhibitors have been shown to block the development of AIDS, at least temporarily. Protease inhibitors are most effective in stemming the progression of the disease when used in conjunction with two different reverse transcriptase inhibitors-the so-called "triple-drug therapy." Efforts at prevention have been focused primarily on changes in sexual behavior such as abstinence, monogamy, the use of barrier contraceptives, and other "safe sex" methods. Attempts to reduce intravenous drug use and to discourage the sharing of hypodermic needles have also led to a reduction in infection rates in some areas. Since mothers can pass HIV to their fetuses, positive women are counseled to consider avoiding pregnancy and pregnant women are often advised against breast feeding.

Family Planning/ Population Control

- **Family Planning** is the conscious effort of couples to regulate the number and spacing of births through artificial and natural methods of contraception. **Population control** is a broad concept that addresses the relationship between fertility, mortality, and migration, but is most commonly used to refer to efforts to slow population growth through action to lower fertility.
- **Causes:** Overpopulation in an area is linked to several factors, especially: cultural values regarding sexuality, reproduction, and family size; and access to, understanding of, and financing for safe family planning methods.
- **Effects & Symptoms:** (1) Family planning saves lives. By spacing births, family planning lowers mortality among both women and children. Just by increasing the time between births or the age of first motherhood, family planning can reduce infant and child mortality by up to 25%- about three million lives a year. (2) Use of family planning can also help reduce the toll of repeated pregnancy and childbirth on women's health. Currently an estimated 600,000 women die annually from pregnancy-related causes. (3) Family planning also helps stem the spread of HIV/AIDS - directly, by making condoms available, and indirectly, by teaching women how to better negotiate condom use by their male partners. (4) It lowers the number of deaths from unsafe abortions. (5) Slower population growth can help alleviate environmental stress. Access to fresh water, the conservation of forests, and the preservation of species-rich habitats can all benefit from slower population growth. (6) Many women and girls in developing countries do not receive the same level of education as men, and they marry at a very young age. Postponing childbirth among young women increases their chances of receiving a good education, which is vital to social, political, and economic empowerment.
- **Treatment & Prevention:** Prevention of overpopulation and complications/hazards to women and children brought on by too many births, spaced too close together is family planning. Family planning includes education of people in their childbearing years about reproduction, sexuality issues, and contraception, as well as access to contraceptives (e.g., the pill, diaphragm, condoms, etc.) that are reasonably priced and safe.

Dysentery

- Definition: An infectious disease of the colon.
- Causes: Although several organisms can cause dysentery, *Shigella* are the most important. *Shigella dysenteriae* type 1 (Sd1), also known as the Shiga bacillus, is the most virulent of the four serogroups of *Shigella*. Sd1 is the only cause of epidemic dysentery.
- Effects & Symptoms: In addition to bloody diarrhea, the illness caused by Sd1 often includes abdominal cramps, fever and rectal pain. Symptoms include bloody, mucus-filled diarrhea; abdominal pain; fever; and loss of fluids from the body. Approximately 5-15% of Sd1 cases are fatal. In Africa, epidemic dysentery due to Sd1 appeared in eastern Zaire in 1979 and has subsequently been confirmed in Angola, Burundi, Equatorial Guinea, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Sao TomÉ and Principe, South Africa, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe.
- Treatment & Prevention: During an epidemic, all dysentery patients should receive an antibiotic to which Sd1 from local cases has been shown to be sensitive. (A major obstacle to the control of Sd1 is its resistance to many antimicrobial drugs. In one central African country the bacillus was resistant to all oral antibiotics that were locally available.) Dehydration should be treated with oral rehydration salts or, if severe, with intravenous fluids. Early detection and notification of epidemic dysentery, especially among adults, allows for timely mobilization of resources needed for appropriate case management and control.

Cholera

- Definition: Cholera is an acute intestinal infection caused by the bacterium *Vibrio cholerae*.
- Causes: Cholera is spread by contaminated water and food. Sudden large outbreaks are usually caused by a contaminated water supply. Only rarely is cholera transmitted by direct person-to-person contact. In highly endemic areas, it is mainly a disease of young children.
- Effects & Symptoms: When cholera occurs in an unprepared community, case-fatality rates may be as high as 50% -- usually because there are no facilities for treatment, or because treatment is given too late. In contrast, a well-organized response in a country with a well established diarrheal disease control program can limit the case-fatality rate to less than 1%. It has a short incubation period, from less than one day to five days, and produces an enterotoxin that causes a copious, painless, watery diarrhoea that can quickly lead to severe dehydration and death if treatment is not promptly given. Vomiting also occurs in most patients.
- Treatment & Prevention: Most cases of diarrhea caused by *V. cholerae* can be treated adequately by giving a solution of oral re-hydration salts. During an epidemic, 80-90% of diarrhea patients can be treated by oral re-hydration alone, but patients who become severely dehydrated must be given intravenous fluids. In severe cases, an effective antibiotic can reduce the volume and duration of diarrhea, although resistance is increasing to the most common antibiotic. When cholera appears in a community it is essential to ensure three things: hygienic disposal of human faeces, an adequate supply of safe drinking water, and good food hygiene. Effective food hygiene measures include cooking food thoroughly and eating it while still hot; preventing cooked foods from being contaminated by contact with raw foods, including water and ice, contaminated surfaces or flies; and avoiding raw fruits or vegetables unless they are first peeled. Washing hands after defecation, and particularly before contact with food or drinking water, is equally important.

Yellow fever

- Definition: An insect-borne tropical disease
- Causes: Yellow fever is caused by an arbovirus (Flaviviridae), a small RNA virus that is transmitted by the bite of mosquitoes.
- Effects & Symptoms: The acute form of the disease causes headache, muscle aches, fever, loss of appetite, and vomiting. The infected person may also develop a red tongue, flushed face, and reddening of the eyes. By the fifth day, jaundice, stomach pain, and bleeding (which may appear as bloody vomiting) develops. Delirium and seizures followed by coma are common. Death occurs at the end of the first week of symptoms and as many as half of the infected people may die.
- Treatment & Prevention: There is no specific treatment for yellow fever. The present treatment is supportive. Intravenous fluids are given to treat dehydration, low blood pressure, and hypoglycemia (low blood sugar). Antacids and H2 histamine blockers are often prescribed to protect the stomach from bleeding. Medications such as acetaminophen are used for fever control. Dialysis may be needed if kidney failure develops. Transfusions of fresh blood, or plasma transfusion, may be needed to control severe bleeding disorders. Vaccination is the only sure prevention for yellow fever. Use of mosquito repellents, full covering clothing and screened housing will decrease

exposure risk. Mosquito control has decreased the risk in countries where the disease was once prevalent. The risks remain however, because the mosquito has increasing resistance to insecticides.

Measles

- **Definition:** A highly contagious viral illness
- **Causes:** Rubeola, or measles, is caused by the paramyxovirus. The infection is spread by droplets from the nose, mouth or throat of an infected person. The incubation period is 7 to 14 days before symptoms generally appear. An immunity to the disease occurs after vaccination, after active infection, and passive immunity of an infant whose mother is immune lasts most of the first year of life. Densely populated urban areas are particularly at risk, where the virus may be kept circulating by numerous pockets of susceptibles, despite a relatively high overall level of coverage. The urban poor usually have less access to immunization services, as well as frequently having ethnic or cultural reasons which might hinder their accepting immunization.
- **Effects & Symptoms:** An estimated 700,000 thousand deaths occur annually in developing countries from measles; these are mainly children. Symptoms include: sore throat, runny nose, cough, muscle pain, fever, bloodshot eyes, tiny white spots in mouth, light sensitivity, rash.
- **Treatment & Prevention:** There is no specific treatment of measles. Symptomatic relief may be achieved from bed rest, acetaminophen - oral, and humidified air.

Tuberculosis

- **Definition:** A contagious bacterial infection
- **Causes:** Like the common cold, TB spreads through the air. Only people who are sick with pulmonary TB are infectious. When infectious people cough, sneeze, talk or spit, they propel TB germs, known as bacilli, into the air. A person needs only to inhale a small number of these to be infected. Left untreated, each person with active TB will infect on average between 10 and 15 people every year. But people infected with TB will not necessarily get sick with the disease. The immune system 'walls off' the TB bacilli which, protected by a thick waxy coat, can lie dormant for years. When someone's immune system is weakened, such as with HIV/AIDS, the chances of getting sick are greater. Untreated TB spreads quickly in crowded refugee camps and shelters, which is a problem since the number of refugees and displaced people in the world is increasing. It is difficult to treat mobile populations, as treatment takes at least six months. As many as 50% of the world's refugees may be infected with TB.
- **Effects & Symptoms:** Tuberculosis kills 2 million people each year; over 1.5 million TB cases per year occur in sub-Saharan Africa. This number is rising rapidly as a result of the HIV/AIDS epidemic. The breakdown in health services, the spread of HIV/AIDS and the emergence of multidrug-resistant TB are contributing to the worsening impact of this disease. It is estimated that between 2000 and 2020, nearly one billion people will be newly infected, 200 million people will get sick, and 35 million will die from TB - if control is not further strengthened. Symptoms include cough, fever, fatigue, weight loss, and coughing up blood.
- **Treatment & Prevention:** Drug-resistant TB is caused by inconsistent or partial treatment, when patients do not take all their drugs regularly for the required period because they start to feel better, doctors and health workers prescribe the wrong treatment regimens or the drug supply is unreliable. From a public health perspective, poorly supervised or incomplete treatment of TB is worse than no treatment at all. When people fail to complete standard treatment regimens, or are given the wrong treatment regimen, they may remain infectious.

Hepatitis B

- **Definition:** An inflammation of the liver
- **Causes:** In the general population, hepatitis B is considered primarily a sexually-transmitted disease. It is also transmitted in blood and, prior to the availability of hepatitis B vaccine, health care professionals such as doctors and nurses were at risk for contracting hepatitis B. Because it is very easily transmitted by blood (one virus particle can cause disease), intravenous drug users who share needles and syringes are at extremely high risk. The other common mode of transmission is from hepatitis B infected mothers to the fetus prior to birth.
- **Effects & Symptoms:** Hepatitis B is one of the major diseases of mankind and is a serious global public health problem. Of the 2 billion people who have been infected with the hepatitis B virus (HBV), more than 350 million have chronic (lifelong) infections. The risk of death from HBV-related liver cancer or cirrhosis is approximately 25% for persons who become chronically infected during childhood. Hepatitis B has a long incubation period, occasionally taking up to 6

months to manifest itself. Early symptoms may be a variety of skin rashes and achy joints. Systemic symptoms include fever, malaise, and abdominal pain or discomfort. Ultimately the yellow color of jaundice appears, first in the whites of the eyes and then the skin.

- Treatment & Prevention: There is no specific treatment for acute hepatitis. Rest is recommended during the acute phase of the disease when the symptoms are most severe. In industrialized countries, surgery and chemotherapy can prolong life up to a few years. Chronic hepatitis B in some patients is treated with drugs called *interferon* or *lamivudine*, which can help some patients. However, *interferon* or *lamivudine* therapy costs thousands of dollars and will never be available to most patients in developing countries. It is preventable with safe and effective vaccines that have been available since 1982.

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