

Diseases Associated With Intensive Subsistence Farming in Japan and Korea

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In an interpretation of the geography of the intensive subsistence farming areas in monsoon lands, such as Japan and Korea, it appears desirable to give consideration to some aspects of medical geography. May* defined medical geography as a study that relates geographical factors, which he called "geogens", to pathological factors, which he called "pathogens", to the development of disease in man.

This discussion centers about the major geogens and pathogens associated with intensive farming in Japan and Korea as they are related to man's health, productivity, and cultures.

The three chief geogens at work are: (1) climate (2) biological elements, and (3) human or social conditions. In general, the influence of climate on man is obvious. The correlation between the malaria complex and rainfall has been used to forecast malaria epidemic outbreaks. Malaria is a disease caused by protozoa of the genus *Plasmodium*. Certain species of the malaria vector (insect carrier) the *Anopheles* mosquito, require different temperatures—some require sunshine, other species cloudiness, running water, or still water.

Animal and plant life often have much to do with the carrying and transmitting of disease through contact or ingestion. Fauna is, of course, primarily related to the health of man. For example, diseases of cattle—tuberculosis, brucellosis; diseases of rats—plague and rickettsias; and diseases of dogs and cats—hydatid (cyst like) diseases; may be transmitted to the Korean or Japanese. Flora, such as sea weed and vegetables may be infested with the causative agents of disease and may be ingested by humans or intermediate hosts, animals that carry disease.

Some of the most prevalent diseases in Japan and Korea are tuberculosis, intestinal parasites, malaria, amoebic dysentery, bacillary dysentery, typhus, cholera, beriberi, lung flukes, liver flukes, blood flukes, leprosy, and venereal diseases.

The next geogen to be considered is the human or social factor, one of which is population distribution and density. Both in the islands and on the peninsula the people are seriously overpopulated with tremendous numbers in concentrations on the fertile plains along rivers and the ocean. Here dense agglomerations of humanity live on dirt, eat dirt, and produce dirt. Use of night soil, human fertilizer, to promote growth of edible plants is possibly one of the greatest causes of disease. Applied to the fields in summer, it is soon washed into the irrigation ditches and carried off into streams where pollution results while the crops are contaminated. Excreta frozen on the surface during the winter and washed out with the thaw, and eggs of many worms, cysts and spores of countless other organisms are spread over the fields. In this "Empire of Soil Pollution" the "Fecal Peril" is a constant one because of "too many people on too little land."

Another important geogen is housing, which is usually inadequate for complete health protection. The dwellings of the Far East generally are constructed of light materials and are heated to less than 60° conditions which explain the prevalence of respiratory diseases. Many of the huts are built of mud bricks with rice-thatched roofs, structures unsanitary and unhealthy to their occupants. Thatch and rice mats on the floor harbor fleas. The size of rooms and total floor space is unsatisfactory, placing everyone in too close proximity. Badly lighted and badly ventilated, homes are often the source of disease infection.

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The standard of living is a significant geogen in causing disease to occur. There is a low standard in Japan and Korea judged by the American level. As a result, there are many unsatisfactory conditions such as poor diet, sub-standard housing, lack of education, and very bad sanitation practices.

More food per acre can be obtained in the form of cereals than in the form of vegetables or animal products. Rice yields more palatable and nutritious food per unit of land than any other grain crop. It is the chief food consumed, although in certain regions it is eaten along with other grains. In most regions rice is the main staple item with whatever seasoning can be acquired. Fish add variety when they can be obtained. Little else is eaten so that the diet is lacking in vitamins, minerals, fats, proteins and other health-protection elements. For example, where rice is eaten people develop beriberi, a disease caused from a vitamin deficiency. Present policy is to wash and hull rice only to the extent of seven-tenths of its weight and to recommend the admixture of barley which results in this nutritional deficiency. Except for a few places where rice is parboiled before grinding, beriberi is endemic.

Clothing looms large as a social geogen. The padded clothing worn in the Orient winters favors lice infestation. There was a louse-born typhus epidemic in Korea during 1952 which totaled some 807 victims. Such apparel becomes contaminated with germs and is difficult to clean so that filth abounds.

A major social geogen is sanitation. The night soil problem has already been discussed. The people so frequently know little of modern sanitation. It is common to wash vegetables for market in the polluted streams, to allow flies, rats and other vermin to reach food, and to permit sick people to handle food in its preparation. Garbage, fertilizer and refuse disposal is neglected and sewers are uncommon. Those that are ill are allowed to stroll about so that in Japan it is not an uncommon sight to see pedestrians with cloth masks covering their mouths and noses to prevent becoming infected with respiratory diseases.

Income, a social geogen, has been a major deterrent in Korean and Japanese health programs. In both the per capita income is very low. Very little money is available for doctors' fees and medicines. Midwives deliver the children rather than physicians. Vaccinations are too few. Lack of education leads to unsatisfactory sanitation practices and to considerable resistance to improved conditions.

Pathogens, pathological factors, which are the cause of disease itself, may be identified in Japan and Korea. Some of these are causative agents, vectors, and intermediate hosts. Causative agents include: viruses which cause smallpox and influenza; rickettsias which cause typhus; spirochetes which cause syphilis; bacteria which cause tuberculosis, cholera, leprosy, and bacillary dysentery; protozoa which cause amoebic dysentery; and metozoa which infect man with intestinal worms, such as nematodes, tapeworms and flukes.

Most vectors—transmitters of disease—are arthropods, belonging to the animal kingdom. These pathogens may transmit a germ superficially, as in the case of flies, that pollute food or skin with their feet, saliva or feces; or internally as in the bite of lice, fleas, or mosquitoes. Understandably, the life and activity of these vectors is inescapably bound up with factors of the geographical environment.

Fish is one of the chief intermediate hosts—carriers of disease—to be found in Japan and Korea, causing disease both by contact and ingestion. More often fish prove a source of disease because they are insufficiently cooked; this is in part due to the taste for raw fish. Fish and crabs are the intermediate hosts for a number of helminths. Snails are intermediate

hosts for Asiatic schistosomiasis. In the final larval stage the trematode larvae come out of the snail and penetrate through the skin of the farmer as he wades through the mud of his fields. Later they develop into the adult form and lay their eggs under the mucosa of the intestine, from which they are restored to nature through the conveyance of the feces.

Geographic study of an area entails some consideration of its health conditions, a phase designated medical geography. An approach helpful in such analysis is to relate the so-called geogens and pathogens. In Japan and Korea medical geography has particular significance, and application of its discipline to the region should clarify problems and point to their solutions.