

Microbiology Case Study – Scenario



After joining the Peace Corps, you have been assigned to an isolated village on the steppes of Mongolia, north of Bayanhongor. Your assignment is to set up a clinical laboratory associated with a tiny medical clinic staffed by an old Mongolian doctor of Oriental medicine named Lhamo and a young physician from Louisiana, Dr. Crayfish. Your patients come primarily from the many animal herders currently using summer pastures within a 150kilometer radius of your clinic. Click [here for a virtual tour](#) of where you will be living. You had to select a limited number of supplies because pack goats, each carrying 40 lbs., brought in your supplies over a torturous mountain trail. The electrical supply to the village is provided by a finicky old diesel engine. You have carefully selected the essential tests for the clinic. You hope they have survived the journey in without refrigeration.

The village has given you a yurt to put your microbiology lab in. This also serves as your bedroom, living room and kitchen, which makes it difficult to observe the sacrosanct no eating or drinking in the lab rule. You brought a solar panel and battery to reliably run your tiny refrigerator and the light on your microscope. You were able to find materials for a makeshift workbench and stool and you are very proud of the incubatory you designed, and insulated metal box heated by candles...tricky to keep at an even temperature though. It is big enough to hold a big candle jar for CO₂ incubation. You found a source of bottled gas about 300 kilometers for your Bunsen burner. Outside is a makeshift autoclave (a large pressure cooker you found in a bazaar in the capital city of Ulaanbaator), which is heated over a dung-fuelled fire. You are hoping that some more sophisticated tests will arrive next week but transportation is somewhat unreliable...somewhat like UPS but with pack animals! There are some sheep in the area, grazing on the sparse vegetation so you have been able to use them for blood donors. They are sure fun to catch!

You have no disposable materials except for loops. You must wash and sterilize all of your dishes, which survived the trip in amazingly well. Imagine glass petri dishes (most of them made the yak ride across the plateau and some low mountain ranges without breaking and the packing is now your incubator insulation.) Fortunately for you, the old Mongolian doctor has a very curious granddaughter in his charge and she is fascinated by your lab and is most eager to help you. She even hauls the water from a half-kilometer away, an accepted and essential activity for the children in this village.

You have devised a handy form listing the test materials available and the incubation time and conditions. It is taped to the wall of your yurt. Your refrigerator is really small and your 14-year-old volunteer assistant may have to make up some media so you may need to wait a day to complete some tests.

You assign all of your samples a number so you can keep track of them. You are concerned that your samples may also contain organisms normally found at that collection site. Dr. Crayfish sends you the patient's history so you can select the test most appropriate for the patient's symptoms. You have a limited number of supplies that will not be replenished soon. You need to make wise choices about the tests you choose to run. The Peace Corp chose you for this assignment because of your expert knowledge of microbiology. They knew you would be able to find the one organism that is causing the disease symptoms from the many organisms that produce similar symptoms or might be normal flora of the collection site. You must also determine which of the limited supply of antibiotics you brought with you will best treat the sick villagers. The Peace Corp wants to save lives and improve the health of these villagers so they can lead more productive work lives and better the conditions of their families and communities. They are also interested in not creating strains of antibiotic resistant bacteria in these developing areas.

What a wonderful place to work, fresh air, spacious skies, important work, a few very useful lab references and your trusty lap top computer. An old Mongolian, a quirky Cajun, a fascinated child and an interesting group of patients make for great company...and you get to brush up on your rusty Mongolian language skills too!