An Essay to Show the Impact of Diseases, Potential Treatments and How to Sustain Them

Diseases are conditions which can harm the structure of a human body and can pose a fatal threat to the life of said person. All diseases are spread through one of the four main infectious agents:bacterium, viruses, parasites and fungi. Malaria is a disease spread by the infectious plasmodium parasite which chooses the mosquito as its host [1]. It infects the bloodstream following a bite from the female mosquito using the red blood cells to make its way towards the liver. Here the parasite becomes even more developed before it enters the bloodstream once again [2]. Common symptoms of malaria are a “high temperature, sweats and chills, headaches, vomiting, muscle pains and diarrhoea” [3]. These symptoms (i.e. signs you have contracted a disease) can last anywhere between seven to eighteen days but there can be some long-term symptoms that last up to a year or, occasionally, longer [4]. The flu is a more common disease that can cause less catastrophic effects to a person’s health but can spread very quickly as it is an airborne disease and stays on surfaces for twenty-four hours after coughing and sneezing has occurred [5]. Unlike malaria, flu is a virus that survives on surfaces and in the air and does not need a host (i.e. a person or animal that can be infected by a germ) to survive. Flu is caused by the influenza virus which is not like malaria, which is a “parasitic infection” (i.e. an infection or disease carried by a parasite) [6]. Both these diseases could have a devastating effect on any settlement despite its population size.

The task we have been set for the final assessment is a challenging one –assign a role in WHO (World Health Organisation) and choose whether to save one of two under-developed settlements in Africa - Franklin Village or Fleming City. It may seem like an easy project, however, there is one big complication that could greatly influence the decision we end up making and what would end up being the most effective choice in the foreseeable and distant future. The major concern is that the village has a case of malaria and the city has a case of flu that could cause varying degrees of damage to the population of these settlements. The main aims in this assignment are as follows. To save as many people within the allocated twelve months as possible using the £5,000 budget we have been granted. We will also create a plan to save any neighbouring settlements if possible by preventing the infectious agents from infecting people and containing the disease inside the chosen location. As well as this, we shall attempt to provide the residents of the chosen location with the most appropriate defences against potential infection while still thinking of the budget and the long-term effects of those chosen defences.

The settlement I have chosen to treat is Franklin Village as malaria can have long term symptoms that often result in death (“584,000 deaths in 2013”) [7]. It is useful to know how many deaths have occurred in previous years, so we can measure how effectively our current plans are working. On the other hand, flu is a far less dangerous disease that can be dealt with more easily in a city where there is high chance of being able to resolve the problems with small amounts of medical attention. Despite this, flu is still very contagious, and it can prove fatal, especially in young children and the elderly [8]. All this information attributed to my decision as to which place to treat. In this assessment, I will express the validity of my choice and shall make arguments and counter-arguments throughout.

To carry out the most effective and casualty-free program, a plan is needed to see any possible errors in original ideas. The first stage of the plan would be to send a package with malaria precautions (i.e. ways to prevent diseases) and doctors to the village. The second step would be to make use of these precautions to protect the village and attempt to contain the disease. Finally, I shall explain how we can change this program in the future, how we could make it sustainable (i.e. able to carry on) and how we could carry it out in other villages, towns or cities in the future.

Firstly, we would have to use around £1,000 of the budget, covering travel costs for return flights from £412 each for a pair of doctors to treat the village members [9]. It would be necessary to fly doctors over as some of the treatments, methods and equipment are best to bring from overseas due to restrictions in where certain medical equipment can be obtained. This money could also cover the costs of travelling to the actual village using the means of transportation available. Although the exact location of the village is unknown, we could infer it would be within a drivable distance. Secondly, we would have to use another £1,000 for the thirty days in Africa the flight provides, a tent to stay in and food to eat. The retail price of a durable tent (The Hi Gear Enigma Elite 5 tent) is £260 [10] and the average weekly shop is around £57 [11] which is information needed to budget the amount of money to give the doctors, so they can live healthily. The rest of the living cost for the doctors would also be covered by this money. We would need to allocate this money to protect the doctors from malaria too using precautions such as anti-malarial tablets (£110 for two people and for thirty days) [12]. That is all the information and budget planning required to set up the program and it can all be used to provide credibility to my argument and prove that it is crucial to know how to correctly plan out the costs of living for the program.

The second step is to use the precautions brought with the doctors to contain the disease by quarantining (i.e. separating any infected people or animals from one another to help slow down the further contamination) Franklin Village with as few casualties as possible along the way. £500 should be allocated to medical equipment such as needles, face masks and storage units among other items. However, the main portion of the budget will be spent on the quarantining plan of the village. There shall be two main ways to de-contaminate the village: These include separating the village into two halves – uncontaminated (i.e. not caught a disease/infection) and contaminated (i.e. has caught the disease/ infection) which can show us who is susceptible to infection as it would be useful to know this, so we could know who to treat. The second method would be to introduce natural predators of mosquitos into the wild.

The village would be separated into two using a border that could either be painted or physically placed. The budget for this border would be £500 including a watch point where the doctor who is not medically attending to the disease could supervise. Although there is no actual cost for a border, £500 will be enough to cover the basic expenses including signing to warn of potential disease spread (i.e. how an infectious agent passes from one to another). The other step to quarantine is stopping the mosquitos from reproducing and keeping the original mosquitos inside the village. This will be achieved by spending £750 on fish (guppies) for ponds, streams etc to prey on mosquito larvae so they do not mature enough to carry the disease [13] and by purchasing bags of bird seed to scatter around the perimeter of the settlement and attract birds which kill mosquitos. These will cover a large area which fish cannot get to. [14]. The guppies cost around £200 for fifty [15] and the bird seed costs around £400 for three different types with two types having twenty bags (£8 each) and one type having sixteen bags (£5 each) [16]. Finally, £100 will go towards mesh coversfor any water wells in the village, so mosquitos cannot breed in them and spread malaria. On the other hand, these methods could be challenging as wild animals are very unpredictable. It could also be a challenge as there could be people who do not obey the border and could cause a person to become ill or hurt.

My final method is treatment (i.e. medical care given to someone who has contracted an illness/disease) and precaution which is possibly the simplest and most effective method to be used. I would invest the remaining £1,250 of the budget into this plan to allow it to succeed. The first method involves providing the villagers with mosquito spray which is extremely effective as a defence to use on your skin, houses and anything else that could need protecting. Affordable bug spray costs around £4 per bottle [17]. The second step to take would be providing bed nets for the inhabitants so they can be protected when they are vulnerable (i.e. susceptible to becoming infected) such as when they are sleeping or resting. Bed nets cost around £4 [18]. These prices mean that WHO would be able to afford one hundred and twenty-five bottles of insect repellent and one hundred and eighty-seven bed nets to be shared out amongst the village. The average family in a village has twelve children (plus two parents) [19] so each family (around thirty-five families) of the five hundred people could have three bottles of mosquito spray with bottles left over and families could have five bed nets each with spare nets in case of damage to the originals. There would be a collection point set up by the doctors where these could be obtained and there would also be a system of checking which families have had their allocated precautions and which ones haven’t, so everyone could collect their allocated amount of precautions efficiently.

This year, there will be a more effective vaccine (the only currently approved one is 26%-50% effective) that will also, most likely, have a clearer price and will hopefully be purchasable all over the world which will mean they can serve as sustainable precautions [20]. This would mean that vaccinations will become a reliable method of treatment and could save a lot more people. The future could also bring more budget towards the program from crowdfunding and charity work to raise funds. These new funds could contribute to making this program sustainable by treating the surrounding villages to further quarantine the parasites inside the original village in the hope that we can eradicate malaria from the area. In the future we would hope that, when we have treated all the villages with malaria, we can treat the city with flu with the annual funds to fully de-contaminate the area from potential infection and disease spread. Although flu is still a challenge to treat, malaria is a far more costly and hazardous disease to medically attend to, so we could eradicate flu by using herd control (i.e. using vaccinated people as a barrier so that non-vaccinated people will have a completely cost-free defence). Other low-priced ways to treat flu include ibuprofen and paracetamol, keeping warm, resting well and drinking plenty of water [21]. These are completely different to anti-malarial precautions such as malarone (i.e. anti-malarial tablets) which is very expensive as well as the other malaria precautions which amount to a high cost [22], [23], [24].

In conclusion, I have decided to save Franklin village using the knowledge I have obtained during the tutorials and explained how my plan will be carried out. I have also explained how much money should be dedicated to different areas of the program. The third area of my essay showed the methods used to treat the disease and quarantine the village. I showed precautions and treatments used to treat malaria such as malarone, insect spray, mosquito nets, natural predators and covering water sources as well as talking about the methods we can use to treat the flu such as ibuprofen and paracetamol, keeping warm, resting well and drinking plenty of water. Also, I explained how I could improve my plan in the future by taking advantage of up and coming technologies such as malaria vaccinations and by thinking of ways to raise money to carry on the program sustainably. Penultimately, I showed how malaria is treated when compared to the flu. Finally, I compared the treatments of malaria and flu and also the price of those treatments.

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