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Viruskenner 2020-2021: hygiene and lifestyle

1. The assignment

Client

The client for this assignment is Professor dr. Eric C.M. van Gorp, a virologist and infectiologist at Erasmus Medical Center in Rotterdam and president of the Cirion Foundation. Eric van Gorp and his team at ErasmusMC have often been in the news this year to talk about COVID-19.

Throughout this project you will work as a virologist on behalf of the Cirion Foundation. As a virologist, you will research the life cycle of viruses like COVID-19. Where do viruses come from, how do they spread from person to person or from animals to human beings (transmission route), which symptoms does an infected person have and when and for how long is someone contagious? Using this knowledge, you will develop medicine, vaccines and methods to prevent more infections. Apart from this, it is important that knowledge is transferred in such a way that people can get the right information, that preventive measures are taken, and that people follow the rules around the virus. As a virologist you will therefore also be visible in the media and research the most efficient methods to inform young people and other target groups about infectious diseases. This part of being a virologist plays a central role in this project.
Cirion, which was founded in 2000, stimulates cooperation between local and international experts to create solutions for important infectious diseases. The organization initiates and supports research and, through educative programs, offers an important contribution to the transfer of knowledge. This is very important for preventing infectious diseases. Therefore, "Knowledge as anti-virus" has been the slogan of the Viruskenner program for years.

For more information on Cirion: www.cirion.net en http://www.viruskenner.nl
https://www.facebook.com/pages/Viruskenner/110687988987798

The current situation

For years, virologists have been warning the world about a possible pandemic which would infect millions of people worldwide, and kill thousands. Despite these warnings, and despite the SARS-virus in 2003 and the Zika virus a few years back, in November 2019 a new Corona virus variant turned up in China. Because of human travel, climate change, and high population density, COVID-19 quickly spread around the world. Scientists from all over have worked night and day to find a vaccine that can protect us from COVID-19. Until then, we'll have to follow an age-old rule: preventing contagion is the only solution.

At the same time mosquito transmitted viruses like westnilevirus are spreading over Europe, also in Italy and also in the Netherlands. But beside the mosquito borne infections there are more transmission routes to learn about. The rodent borne infections, the airborne infections, the sexual transmitted infections, the water and foodborne infections.

Many airborne viral infections can be prevented by being sufficiently hygienic and taking precautions, as well as adapting our way of life. Less travel, keeping 1.5 meters distance from each other, washing one's hands often and no shaking of hands are all simple rules and examples how to reduce reduce the risk of contagion.

However, not everyone has access to this information, just as not everyone understands it. And the measures are not always fun, so not everybody wants to, or is able to, follow the rules.
Prevention and knowledge remain the most important weapons against current and future infectious diseases. But which prevention measures or methods actually work? And how do you reach the right target group with correct information so that they can also use or stick to the prevention methods?

Assignment
The client is asking for a new or improved way of preventing contagion with a virus and communications advice on how to best bring this method to the attention of the target audience.

2. Details of assignment

1. Orientation of the potential virus and transmission route

Visualize the life cyle of the potential virus by creating an infographic in which you, among other things, include:

- information about the transmission route through which the virus can spread from host to host and methods how to block this transmission route
- how the body's immune system works
- the various symptoms of the disease that the virus could cause
- the circumstances under which the virus can spread
- which groups are at higher risk for developing disease

There are several transmission routes through which pathogens can transfer to human beings. Some diseases are more easily transmitted and are therefore more contagious than others. The severity and the development of an infection or disease depends on several factors, one of which is the capacity of a microorganism to enter a host, survive there, and then multiply. The degree to which the immune system is able to counter the growth of the infectious organism plays an important part as well. In a well-functioning immune system, an infection will often not lead to any disease symptoms at all (this is called asymptomatic infection). In some cases, however, a chronic infection can occur which can lead to permanent disease symptoms or even death.
A microorganism can also settle in a body without causing any diseases. In such cases, the host becomes the 'carrier' of a microorganism. There are several high-risk activities through which people can unknowingly catch an infectious disease and export it, among others international tourism, adventurous expeditions in nature, consumption of exotic goods, sex tourism, and illegal trade in animals. Medical professionals should be alert to inexplicable symptoms which may point to an infectious disease, so they can spot a potential outbreak at an early stage. An example of this is the recent outbreak of cholera, which has gained a lot of attention.

Get in touch with experts and students at other schools: http://viruskenner.nl/forums/
Here, you can also ask experts any questions you may have

2. Taking stock and testing existing methods of preventions

Make an inventory of at least three existing methods of prevention and methods that should prevent the spread of the potential virus. Compare the methods on at least the following points:

- Content: correct information about the potential virus.
- Method: the strategy of the prevention method, how does the information reach the target audience?
- Innovation: how innovative/creative/modern is the method?
- Societal impact: does the method actually prevent, does it have an effect, does it reach the target audience, does it change people's behavior and lifestyle?
- Other strong and weak points.
- Any other criteria which may occur to you.

3. Product requirements document

Write a product requirements document for a new prevention method based on the orientation of the potential virus and the inventory of existing methods.

4. Prevention method concept

Based on the product requirements document, develop a conceptual prevention method with which infections in human beings can be prevented and with which the high-risk groups are given the correct information.

5. Field lab [=testing your method in real life situation]

Equip a Field lab in which you can research whether your concept actually have an effect on the target audience and whether it is practically applicable and effective. Make an overview of strengths and a list of improvements of your concept on the basis of a consultation with an expert and the results from the Field lab.

> *In a Field lab, (technological) innovations are tested by end users or a target audience. In your Field lab, you will show your prevention method with experts and end users to research whether it's applicable and effective. This can concern technical innovations but also communication tools as a prevention method.*

Get in touch with experts: http://viruskenner.nl/forums/
On the forum, you can also ask questions on how to equip a proper Field lab and how to do research into the target group or end users.

6. Elaboration and advice on communication

The client requires a detailed elaboration of the concept into a final product. In this process, the improvements from the Field lab and correct info concerning the virus are also taken into account, with

advise on how to best communicate with the target group about the prevention method and bring it to their attention.

Completion of assignment

During a conference or final presentation at your school, you will shortly present (in an elevator pitch) your prevention method and advice on communication to your classmates and experts. Those teams with the most promising prevention methods will be invited to the online finale of *Viruskenner 2020-2021* on April 20th, 2021.

3. The occupation

Study and how to become an expert; the occupation

Virologist

Virology is the study of viruses and its characteristics. A virologist is a person conducting this studies. The work of a virologist is considered important, because viruses can be a threat to people's health and the science of these viruses can contribute to reducing the chance of health risks. The specific activities of a virologist depend on the organization for which they work. They may conduct research in a laboratory, investigating the effect of viruses with a specific type of disease, but a virologist may also be involved in making a plan to counter the spread of viruses. Lastly, they may also be involved in the treatment of patients with a viral infection.

Where will you be working?

In this project, you will be working as a virologist on behalf of the Cirion Foundation. As a virologist, you will be researching the life cycle of viruses. Where do viruses come from, how do they transmit from person to person or from animal to human being (transmission route), which disease symptoms does somebody who is infected have, and when and for how long is someone contagious. Using this knowledge, you will develop medicine, vaccines and prevention methods to prevent more infections. Apart from this, it is important that knowledge is transferred in such a way that people can get the right information, that preventive measures are taken, and that people follow the rules around the virus.
As a virologist, you will also be visible in the media and you will research the most efficient methods to inform young people and other target groups about infectious diseases. This part of being a virologist plays a central role in this project.

Information about the study course

Biomedical Sciences is a Bachelor and Master course at university level, whose aim is to do scientific research to benefit medical professionals, and medicine in general. Knowledge about sick and healthy human beings plays a central role in the course of the study of Biomedical Sciences. Students learn how the body of a healthy human being functions, from a molecular life up to the entire organism. Apart from this, they discover where diseases originate and how they can be prevented.

Biology and Medical Laboratory Research (Life Sciences):

At college level, there are also several biomedical courses, such as Biomedical Analyst. Graduates can work in hospitals, research centers, pharmaceutical companies, or universities. In laboratories, they will research the cause and prevention of disease, as well as how to effectively combat them. Examples of diseases that are often researched are cancer, diabetes, and Alzheimer's, and diseases that are caused by pathogenic microorganisms, like bacteria, viruses, fungi and parasites. The research may also be aimed at improving methods that allow for a quick detection of a disease in a patient's material, so that it can be found at an early stage and effectively combated.

4. Assessment

Product assessment

The product assessment deals with the performance of the team. All members of the team will receive the same grade for the final result. The product assessment consists of the report and the presentation. The client can have a say in the grading of the report, but your teacher ultimately decides on the grading of the product assessment.

The report

1. The content of the information/ message
2. Creativity and innovation
3. Social impact [= the project you want to implement tomorrow to create impact]

Presentation

During the presentation at school, your team will have the opportunity to elaborate on your prevention method and give arguments for its usefulness. Emphasize your communications advice and give arguments, based on your preliminary research, how you decided on this piece of advice.

Process assessment

The process assessment concerns the capacities of each individual team member. Every team member will develop their own capacities and develop their own contribution to the group process. The grade for the process assessment constitutes 50% of the final grade for the project. The process assessment consists of a grading by the team, a grading of yourself, and a grading of your teacher. Your teacher ultimately decides on the grading of the process assessment.

Assessing by teacher

Being innovative
Perseverance
Working procedurally
Working based on knowledge

Extra information about the assessment

Other school subjects

Biology is a subject which will be involved in this project quite naturally, because *Viruskenner* requires a lot of knowledge about the human immune system and viruses.
Cooperating and deliberating with school subjects which require research skills may be useful. For second graders (Dutch students aged 13-14), doing research and writing a research plan may be quite new.

Organisation

For each participating class at every school, one or more teams (those with the most promising prevention methods) are invited to take part in the national finals. During these online finals, every team will have a short period of time to present their prevention method and communication advice to the jury, which will consist of experts. The best teams will advance to a final round, which will give them time for a more comprehensive presentation. All final participants will then also play the *Viruskenner* quiz, with which the student can win fun prizes. This year Viruskenner participants come from Italy, Surinam and the Netherlands.
The online international finals will be held on April 20, 2021.