**What global challenge will your team address?**

We will address the good health and well-being goal through early detection of depressive disorders in children and young adults aged 5 to 22. We will do so by integrating online psychometric games tailored to each age group into the school experience. The results of these games will be analyzed by a machine learning algorithm to identify students who might need help.

**In approximately 300 words, describe the global challenge and explain why your team is**

**interested in it and why it is important to resolve**

Depression is one of the most common mental disorders (). It is an issue that goes beyond religion, culture, age and economic status. Globally, it is estimated that more than 300 million people suffer from depression (). In addition, research has shown that 70% of mental health problems start during childhood or adolescence ().

Depression is one of the main causes of disability in the world () and has personal, social and economic costs. People suffering from depression function poorly at school, at work and in their family. Globally, the productivity loss, absences from work and medical expenses due to depression cost $210.5 billion per year. Furthermore, 70 percent of adolescents who go through a major depressive episode experience a severe loss (). Depression is also the major cause of the 800 000 suicide deaths that occur annually. Lastly, mental health is known to be an important risk factor for the development of alcohol and illicit drug use disorders ().

Unfortunately, there is still a lot of stigma associated with depression and mental illness in general. Even more so, in developing countries where we come from. There, many are those who’ve never heard of depression and believe mental disorders are an excuse for bad behaviour. This ignorance significantly contributes to the problem and correlates with the almost inexistent depression treatment.

Despite all the consequences listed above, there’s lot of effort invested into recovery from depression but not much is done to prevent it from happening in the first place. Hence, our interest in detecting depression symptoms early enough in order to provide necessary support to children before it’s too late.

**In approximately 400 to 800 words, provide a brief outline of your team’s unique solution to**

**address the chosen global challenge**

Our solution consists in the early detection of depression symptoms in children and young adults aged 5 to 22, by integrating online psychometric games into the school experience. For example, each class could play the games once a month for 15 minutes during computer lessons. This will be done with parents and students consent but without fully revealing the research objectives to students in order to ensure truthful participation. We chose games over a questionnaire because we believe they will make the experience more enjoyable and thus keep students engaged. Additionally, games access will be restricted to the designated class period to avoid any negative impact on students performance.

The games will be developed by psychologists/ psychiatrists and will be tailored to each age group. Their contents will help identify common signs and symptoms of depression such as sadness, anger, withdrawal, loss of interest, guilt, difficulty concentrating and recurrent thoughts of death. For example, at the beginning of each game, participants might be asked to create their own emoji by choosing different features such as physical attributes, current state of mind (sad, happy, worried, indifferent), social status (option to befriend other students), employment status and living arrangement (living alone or with relatives).

Students will create an account and sign in before each game so that changes can be monitored, and results saved for analysis. Required sign in information will include last and first name, school name and grade level. Teachers will help participants that are too young to do so. To conduct the analysis at a school level, each participating school will have its own platform where their students results will be saved.

The games will be analyzed by a machine learning algorithm trained to identify depression signs. For example, the algorithm will raise a red flag if a student makes an emoji that is sad, does not have any friend, does not want to work in the future and often fights. Teachers will then receive their class’ results containing every student mental health diagnosis. They will be trained to fully understand and interpret the results. If a student’s responses repeatedly raise a red flag, teachers will inform the parents and appropriate measures will be taken.

Using an algorithm will ensure fast analysis and will not require any additional time and financial costs from the schools. Moreover, our digital approach will allow to build a database for further research. However, it might be challenging to implement this solution in developing countries where most schools do not have a computer room. In the absence of desktops or laptops, students in the developing world could use their smartphones to participate, if the school provides internet. Research has shown a significant increase in mobile phone penetration in the developing world, with more people having access to mobile phones than to electricity or clean water (). Although this temporary solution still excludes those who do not have a smartphone or even a phone such as most primary school students, we’re nonetheless hopeful as to its feasibility given the global push towards adoption of digital technologies and computer aided instructions in schools.

We hope that our solution will ensure healthy lives and promote well-being for all.

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