Remote Digital Health care and alternative solution for Medical support in Rural areas

Social Issue and Current Challenge

The social issue and challenge this report address lack of medical support in rural areas.

According to an OECD Australia has 3.6 doctors per 1000 people, which is over the OCED average of 3.4 doctors per 1000 people. This statistic shows that there are enough doctors in Australia, but the problem is at rural areas in Australia. Many doctors choose to work in big hospitals or urban areas, instead of rural areas and there are only 2.5 doctors per 1000 people in rural areas. (2018)

The intake of doctors in rural area is even dropping every year and rural intake has dropped from 609 doctors in 2018 to 486 doctors in 2020. This shows that less and less doctors go to work at rural areas.

Government and Australian Medical Association is trying to solve this issue by asking more doctors to work at rural areas, but this problem is not being solved.

Currently when people in rural area require medical support, it requires them for a long travel to get any help. It may be alright for some people who may go to see doctor once every while, but for some people with chronic disease who requires constant support from doctors, it will be very difficult for them to get the necessary support.

According to Australian Bureau of Statistics, in 2017-18, 47.3% of Australians have one or more chronic conditions. This is nearly half of population and is increasing every year.

The suggested solution is limited and can not support every people and just is an alternative solution that may help people in rural areas.

Potential Solution

Since, people in rural areas have limited access to doctors, but has access to internet, an easier solution can be done with this. This report suggests for an alternative solution to the issue by introducing a digital service based on mobile application or web that can diagnose and link to a GP or specialist and to emergency services. This service will be providing 2 major services, which are diagnosing and constant medical support for people with chronic disease.

Diagnosing service

This diagnosing service will be formed in multiple steps. First step will be free where the users can self-diagnose their symptoms with the service which will be operated by an AI system. Then to verify the diagnosis made by AI, users will have 2 options. Users may pay to see and talk to the doctor over the video call or get location and information of nearest hospital. Once this is done, the doctors will inform the user of their diagnosis or required action such as booking reservation to meet. If the doctors think it is emergency, they may contact the nearest hospital or ambulance service to provide emergent support.

For people who are difficult to go see a doctor, they can use a self-diagnosis application that is based on Machine Learning system. This will be operated by touch click on the screen with questions or voice recognition and talking to an AI. This self-diagnosis system will provide multiple diagnosis it can provide with possibilities of each diagnosis. This result may not be completely accurate, since it lacks required information to diagnose and symptoms can act differently per person.

To verify the diagnosis, a video call can be made to the doctor, who can look at the patient and talk them out. These doctors will be GP or specialist in that area, based on recommendation system of the AI. The recommendation will be made on the distance and diagnosis AI system has made. Some illness like cold and flu can be diagnosed easily without additional tests, but some more serious illness may require additional tests. If that is the case, the user will be asked to visit the hospital for additional tests. If required, the doctors will ask the emergency ambulance or helicopter service to bring in the user to hospital.

Support for people with Chronic Disease

Half of Australian population has at least one of chronic disease and large number of people require constant medical support. Main chronic disease are diabetes, heart and vascular disease, blood pressure and mental conditions. These diseases require constant medical support from doctors and once diagnosed this can be managed relatively easily.

If the patients can talk to doctors over the video call, it can reduce their effort and time to travel long hours to see a doctor. They may still need to visit the doctors every once a while, but it can save time, when they feel unusual and want to talk to a doctor. If the doctor has the record and details of the patient, it would be easier for the doctor to manage the patient over the internet.

In most cases of usual visit to doctors end up just talking for few minutes about their symptoms and recent conditions and activities. This can be easily done over the phone or video call, which can save both patients and doctors time.

In example of a patient with diabetes, if their blood sugar level result of daily check returns significantly different from previously, they can make call to the doctors and consult about this, instead of traveling few hours on the car to ask about this.

However, it would be difficult for both user and doctor to make video call every once a while, so there will be a system that will be can be linked to a wearable to track the health status automatically or a AI that will talk to the patient everyday to keep records of current status. If the AI finds any anomality, it will report to doctor and in emergency it will make emergency call.

Problem

Internet Connection

This app will be based on a smart device which requires internet connection. Currently, not every region has broadband or 3G/4G connections and users may not be able to use this service.

However, telecom companies are increasing their areas connection and improving the quality

of connection. Also, currently large number of rural areas do get connections of internet, so this service can still aid many people in rural areas.

The speed and quality of internet in rural areas would be much lower than urban areas, so the app should be built very light, and most of service should be on board with the app, not requiring internet connection. If possible, the AI part of step 1, should be saved to the app itself and updated when app updates.

Also, for people who do not have internet connection, if they have a phone connection, they may still talk to doctors on the phone to explain. This will not be as clear as doctors seeing the patient with camera, but this will be better than nothing.

Medication

Another problem is that doctors can not provide the patient with any medication that can cure or aid the patient. As the meeting with doctor will be over the phone, doctors can not provide them with medication they need. Doctors may be able to send some medications over the post, but some medications which contains any narcotic substance can not be posted with current regulation.

Also, since doctors cannot diagnose the patient completely without any proper equipment and seeing in person, it would also be not safe to send medication which may not be suitable for their current condition.

This is still problem that needs to be considered, and at current stage, any medication support should be only possible after the user has visited doctor at least once and doctors have their medical details and histories.

Absence of doctor

Since the doctors have their usual job and personal life, they can not answer to the patient ASAP. There will be usual working hours of each doctors and in case of emergency the user can request for an emergency service, which will be provided for free, but will be charged if the case was not emergent. This is done to prevent users to make constant emergency calls.

In emergency if the doctor cannot answer the call, it will automatically redirect to any other possible doctor on the list, or 911, if there aren’t any.

Similar services

Currently, there are similar systems like telehealth that Victoria State Government provides, but this is very limited at current stage.

Future plans and requirement

Regulations regarding this service should be investigated thoroughly and research on doctors and actual people’s opinion about this service needs to be done. Some survey or interview needs to be done in order to find out the actual needs and possibilities of this service.

After this meets the standards, the service can be developed, with feeding information to diagnosing AI and training with Machine Learning. Develop voice call system. Some of the

service can be done with 3rd party service.

Since developing the whole AI system would be complicated, basic diagnosis service and video call to doctors should be developed at first to provide service ASAP.

As this service cannot be done by individual, support from government, hospitals, or other health care services would be required. People would have more trust in this service if this was done with some association with reputation.

Conclusion

This suggested alternative solution is not the fundamental solution to lack of health care support due to shortage of doctors in rural areas. Only fundamental solution would be increasing the number of doctors in rural area, which is not possible at this stage, since no one can force doctors to work at rural areas. However, this system can aid people in rural area and can improve their health support. This service will be able to help out people requiring visiting hospital frequently such as people with chronic disease.

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