PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Remote Monitoring of Marginalised Populations Affected by COVID-19: A Retrospective Review
AUTHORS	Ko, Stephanie; Hooi, Benjamin; Koo, Chieh-Yang; Chor, Daniel; Ling, Zheng Jye; Chee, Yen-Lin; Jen, Wei-Ying

VERSION 1 – REVIEW

REVIEWER	Osama El Shamy Vanderbilt University Medical Center - Division of Nephrology, USA
REVIEW RETURNED	09-Aug-2020

GENERAL COMMENTS	Thank you to the authors for their great work in making healthcare accessible to marginalized patients during these trying and difficult times. I commend them on this great initiative. I have a few questions/comments: - How did the authors find out the number of COVID cases in the dormitories? This is a little puzzling to me as the authors reported that 800 of 931 patients used the VSM platform which means that there must be another source that reported to the authors the number of COVID cases – this should be included in the Methods. Moreover, if it was obtained from a source other than the patients themselves, were the names of these 931 patients then shared with the investigators and those particular patients targeted to partake in the study and get the VSM platform? - There is an error in the calculation of the percentage of reported cases of chest pain or breathlessness. The authors say that it is 0.1%, however it should be 0.7% - please also correct this in Table 2. - Why did 132 residents recheck their vitals signs once they had an abnormal reading? Were they educated as to what normal values are? If so, this should also be reported in the methods. Also, did the investigators ask these patients to recheck their vital signs once more to determine which one of the two readings was erroneous? - Volunteer interpreters were used for the WhatsApp video calls, were these same volunteers the ones who composed the texts used for WhatsApp text messaging with the patients? - How would you recommend implementing this in places where people do not have access to smartphones? Perhaps a daily

	telephone call to the patients' phones or centralized phone if in an area where not everyone has a cellphone, but with a landline may be? I would recommend including an idea or suggestion similar to what I described if you agree in order to provide a larger group of readers a greater opportunity to re-produce this in their underprivileged communities

REVIEWER	Elizabeth Sturgiss Monash University, Australia
REVIEW RETURNED	28-Oct-2020

GENERAL COMMENTS	Thank you for the opportunity to review this paper that describes the use of an app to remotely monitor men with COVID infection in dormitories in Singapore. First I highlight issues that may carry ethical components for attention of the editor: - Both dormitories are named. Does the ethics cover naming of the dormitories? I do not see any academic value in identifying the dormitories by name. It would be preferable to have a description of the living conditions - bedding? bathroom access? cooking facilities? It is not clear from the paper what the dormitories are like. - "mobile numbers were used as unique identifiers to monitor the trends of their vital signs. " Mobile phone numbers are not deidentified data. This would be considered identifiable data. Did ethics allow for this? - consent - how was this taken from the patients? - "Each room was provided with a thermometer and pulse oximeter for daily self-measurement" - how were the men instructed to clean the instruments? It is worrisome that instruments were shared with a contagious infection. - "initiate a teleconsultation via WhatsApp® messaging or WhatsApp® video call. Three-way video calls could be arranged with volunteer translators fluent in the residents' native language".- was this in the dormitory? how were privacy issues dealt with? - Figure 1 - is this the spread of COVID through each of the dormitories? If so, it looks worryingly like there was significant spread within the dormitory and I wonder if the shared equipment could have contributed to this? It would be good to have a description about how/if patients with covid were segregated? Or why this wasn't possible? It would be questionable to keep COVID positive patients in a locked dormitory with uninfected patients if this was done for research purposes. Other issues include: 1. suggest add the method to the title to aid future systematic searches 2. the objective in the abstract does not seem to align with the hypothesis in the main body of the paper. It would be more helpful for the reader to have the aim of the paper stated immediately prior to the methods at the end of the background.

	3. the abstract suggests that this paper will investigate the "feasibility" of the app; however there are no data related to feasibility in the paper, apart from uptake. Feasibility would usually imply that the research has explored broader concepts of feasibility than what is presented, and often from multiple perspectives. From the point of view of feasibility, it is striking that there are no data from the patients about the experience of using the app. I do not think this paper is about feasibility. 4. "dormitories in Singapore affected by COVID-19" This description is not clear - are these dormitories that had positive cases? Or close contacts? How were they chosen? More detail here would be helpful to better understand the context. 5. "Most residents owned internet-enabled mobile phones. Residents without internet access were advised to log in their vital signs with the assistance of their fellow roommate's devices." - does this mean more than one person had the same "unique identifier"? How has this influenced the data collection? 6. Please the "Tidier" guideline to give a better description of the intervention. 7. Translation and language needs to be in the methods section, how were languages chosen? How was the translation on the app done? 8. "We collaborated with a Singapore-based health-technology start-up" - please give details on how this was done. In the discussion it is also mentioned that "co-design" was used but without any details. 9. Accessibility of the app is mentioned, but only language considered. Please consider wider access issues such as mobile access, access to mobile data and potential costs involved? 10. Cost effectiveness - this has only considered app costs for the health system; what about costs for the patient? what about costs to the healthcare system - for example how the remote monitoring fits into the wider healthcare system and review? 11. Although the paper discusses diversity, this sample was fairly homogenous. All male; mostly Bangladesh and India. This could be highlighted plus a better description of the healthcare access of these men to understand the context. 12. "We performed a prospective study on the implementation and feasibility" - I do not agree that this paper is about implementation or feasibility. There are no frameworks that would usually frame implementation questions. I would say instead that this is a descriptive piece on uptake of a technology for remote monitoring of COVID. 13. Table 2 is first placed mentioned that only one dormitory was asked about "Chest pain or breathlessness*" - this should be mentioned in the methods. Why was the response rate so low?

	14. "The uptake rate was 85.9% across both dormitories."- is this for patients that used the app once? or number of times you wanted a measurement? This is not clear. 15.Limitations do not report the usual potential issues with self-reported measurements. How accurate were the measurements? There are questions that we cannot know as no data on patient experience was collected - e.g. were patients fearful of putting a number that was high or low? Any concern about being removed from the dormitory etc? This is a limitation of the study. 16. there was no research checklist in the materials provided

VERSION 1 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:

Reviewer: 1

Reviewer Name: Osama El Shamy
Institution and Country: Vanderbilt University Medical Center - Division of Nephrology, USA
Competing interests: None declared

Comments to the Author
Thank you to the authors for their great work in making healthcare accessible to marginalized patients during these trying and difficult times. I commend them on this great initiative.

I have a few questions/comments:

- How did the authors find out the number of COVID cases in the dormitories? This is a little puzzling to me as the authors reported that 800 of 931 patients used the VSM platform which means that there must be another source that reported to the authors the number of COVID cases – this should be included in the Methods.

Moreover, if it was obtained from a source other than the patients themselves, were the names of these 931 patients then shared with the investigators and those particular patients targeted to partake in the study and get the VSM platform?
The co-authors were part of the medical teams deployed to the respective dormitories. They were directly involved in diagnosing and managing residents with COVID-19, which is how the study team obtained the total number of cases. The names and identification numbers of the residents were available to the medical teams for the purpose of direct clinical care but were the data was de-identified and anonymised subsequently toe the purpose of this study. All residents diagnosed with COVID-19 were taught to use the VSM platform upon transfer to the isolation areas of the dormitories. This point is addressed in the manuscript under the Methods section (lines 165-176, page 5).

- There is an error in the calculation of the percentage of reported cases of chest pain or breathlessness. The authors say that it is 0.1%, however it should be 0.7% - please also correct this in Table 2.
Thank you for highlighting this error. We have corrected this is the manuscript (page 6, line 244) and in table 2.

- Why did 132 residents recheck their vitals signs once they had an abnormal reading? Were they educated as to what normal values are? If so, this should also be reported in the methods. Also, did the investigators ask these patients to recheck their vital signs once more to determine which one of the two readings was erroneous?
These residents spontaneously rechecked their vital signs. When pre-set thresholds were breached, patients would receive a message with an unhappy emoji and text in their selected language asking them to seek medical attention if they were unwell. It was observed that this reply prompted many to recheck their vital signs without external reminders. Residents were educated on acceptable readings when being taught how to use the VSM platform. The pre-set thresholds were a heart rate of more than 120 beats per minute or an SpO2 of less than 95% on room air. We have clarified these points in the methods section (lines 178-179 and 184-186, page 5).

- Volunteer interpreters were used for the WhatsApp video calls, were these same volunteers the ones who composed the texts used for WhatsApp text messaging with the patients?
The same volunteers both composed the texts and assisted with the video calls. The volunteer interpreters helped to create a template of translated phrases which could be used for the text messages. For example, "please recheck your oxygen level" was translated into Bengali, Tamil, Hindi and Mandarin, and used by the medical team for the initial WhatsApp® messages. Volunteers were only contacted in real-time if a video consult was required. We have clarified this in line 190-197 on page 5.

- How would you recommend implementing this in places where people do not have access to smartphones? Perhaps a daily telephone call to the patients' phones or centralized phone if in an area where not everyone has a cellphone, but with a landline may be? I would recommend including an idea or suggestion similar to what I described if you agree in order to provide a larger group of readers a greater opportunity to re-produce this in their underprivileged communities
Thank you very much for this suggestion. We have included this recommendation within our discussion (line 308-317, page 8).

Reviewer: 2

Reviewer Name: Elizabeth Sturgiss
Institution and Country: Monash University, Australia
Competing interests: None declared

Comments to the Author
Thank you for the opportunity to review this paper that describes the use of an app to remotely monitor men with COVID infection in dormitories in Singapore.

First I highlight issues that may carry ethical components for attention of the editor:
- Both dormitories are named. Does the ethics cover naming of the dormitories? I do not see any academic value in identifying the dormitories by name. It would be preferable to have a description of the living conditions - bedding? bathroom access? cooking facilities? It is not clear from the paper what the dormitories are like.
Thank you for this suggestion. Our ethical approval covered naming of the dormitories, but we agree that there is no added academic value in identifying the dormitories by name and have changed them to Dormitory 1 and 2.
We have also inserted a description of the migrant worker dormitories into the Methods section (subheading "Setting") for better understanding and to illustrate the context (line 113-123, pages 3-4).

- "mobile numbers were used as unique identifiers to monitor the trends of their vital signs. " Mobile phone numbers are not deidentified data. This would be considered identifiable data. Did ethics allow for this?
Thank you for highlighting this issue. Mobile numbers were used as a unique identifier for clinical teams to monitor the trends of their vital signs as part of routine clinical care. They were not used for research purposes or data analysis, which was done on aggregated, de-identified data. We have clarified this in the manuscript (lines 166-168, page 5).

- consent - how was this taken from the patients?

Thank you for highlighting this. We were granted a waiver of informed consent under the ethical approval for the study, as this was a retrospective review of routine medical care provided to the patients. Mobile phone number collection is a standard field collected at the point of patient registration at all healthcare institutions in Singapore. We have included this statement in the manuscript (lines 224-227, page 6).

- "Each room was provided with a thermometer and pulse oximeter for daily self-measurement" - how were the men instructed to clean the instruments? It is worrisome that instruments were shared with a contagious infection.
Thank you for highlighting this extremely important point. We have rephrased lines 121-133 page 4 to clarify this.
Each patient was given their own thermometer, while the pulse oximeter was shared between individuals in each isolation room (typically 12 residents per room). The vitals monitoring service was specifically only for people who had COVID-19 and were already cohorted and separated from other residents. Instruments were only shared between individuals in the same isolation room who were already known have COVID-19. Medical care was provided in an isolation area of the dormitories. Access to this area was restricted. Residents were taught hand hygiene techniques and provided with sanitisers for cleaning. This was regularly reinforced by the attending medical teams.
- "initiate a teleconsultation via WhatsApp® messaging or WhatsApp® video call. Three-way video calls could be arranged with volunteer translators fluent in the residents' native language".- was this in the dormitory? how were privacy issues dealt with?
Thank you for this question. We have clarified this in lines 197-204 on page 5.
For a three-way video call, the dormitory resident was first messaged in private by a medical professional using a pre-translated message to ask for their consent for a third-party interpreter to join the conversation. There were no objections to the consults. Third-party interpreters were added to the calls by the medical professional. Both the medical professional and interpreters were off-site during the teleconsult. Dedicated SIM cards were used to protect the personal phone numbers of the medical professionals and interpreters. These numbers were discontinued on 1 November 2020. Both medical professionals and interpreters were reminded of their legal and ethical obligation to protect and maintain patient confidentiality.

- Figure 1 - is this the spread of COVID through each of the dormitories? If so, it looks worryingly like there was significant spread within the dormitory and I wonder if the shared equipment could have contributed to this? It would be good to have a description about how/if patients with covid were segregated? Or why this wasn't possible? It would be questionable to keep COVID positive patients in a locked dormitory with uninfected patients if this was done for research purposes.
Figure 1 represents the number of patients that were monitored using this platform. The spikes in the numbers of those that were monitored corresponds to the systematic rollout of the platform after an initial pilot phase, rather than spread within the dormitory. It should be noted that the platform was available only to those who were already positive for COVID-19 and segregated in an isolation area, away from uninfected residents. The creation of isolation areas within the dormitories was done to enable the safe and timely provision of medical care and to protect uninfected residents, not for

research purposes. Uninfected residents were not able to access the isolation areas and did not have access to the chat assistant platform or the monitoring equipment.

Other issues include:
1. suggest add the method to the title to aid future systematic searches
Thank you for this suggestion. We have amended the title as suggested to: “Remote Monitoring of Marginalised Populations Affected by COVID-19: A Retrospective Cohort Study”

2. the objective in the abstract does not seem to align with the hypothesis in the main body of the paper. It would be more helpful for the reader to have the aim of the paper stated immediately prior to the methods at the end of the background.
Thank you for your comments. We agree with you that we have not systematically shown any data related to feasibility and have amended our abstract to remove the word. We have also removed it from line 107 on page 3.

3. the abstract suggests that this paper will investigate the "feasibility" of the app; however there are no data related to feasibility in the paper, apart from uptake. Feasibility would usually imply that the research has explored broader concepts of feasibility than what is presented, and often from multiple perspectives. From the point of view of feasibility, it is striking that there are no data from the patients about the experience of using the app. I do not think this paper is about feasibility.
Thank you for highlighting this oversight on our part. We have amended the manuscript to remove all mention of feasibility. As stated in our response to the above comment, we agree that this study was not about feasibility. We did not systematically collect data on patient experience given the time pressure in designing this system and were hence unable to present any such data in the manuscript. Residents’ feedback and experience did form a crucial part of the iterative development process of the platform, as mentioned in the discussion (lines 283-293, page 8).

4. "dormitories in Singapore affected by COVID-19" This description is not clear - are these dormitories that had positive cases? Or close contacts? How were they chosen? More detail here would be helpful to better understand the context.
Public healthcare in Singapore is provided by three major Public Healthcare Institutions (PHIs), each responsible for a geographic demographic. Nationally, in Singapore, there were COVID-19 outbreaks across almost all foreign worker dormitories. To reduce transmission within and between dormitories, as well as wider transmission nationally, PHIs deployed mobile satellite teams to the dormitories to provide timely medical care for dormitory residents. Five dormitories were under the care of our institution. Of these, the largest (and hence those with the most pressing logistical challenges in terms of patient monitoring) were the two chosen for this study. We have included this elaboration in line 113-123, pages 3 and 4.

5. "Most residents owned internet-enabled mobile phones. Residents without internet access were advised to log in their vital signs with the assistance of their fellow roommate’s devices." - does this mean more than one person had the same "unique identifier"? How has this influenced the data collection?
Residents without a mobile phone who logged with a fellow roommate’s device were advised to include a “nickname” when they logged their vital signs. This was not their full name, but rather a consistent pseudonym or part of their first name, which allowed the medical team providing care to differentiate between the holder of the mobile phone number and the second individual. This data was not used for data analysis or research purposes.

6. Please the "Tidier" guideline to give a better description of the intervention.
We have filled in and attached the “Tidier” guideline.

7. Translation and language needs to be in the methods section, how were languages chosen? How was the translation on the app done?
The languages were chosen based on the most commonly spoken languages by dormitory languages. Volunteer translators were asked to translate a series of over 100 phrases into the various languages. Translation into other languages which were never deployed (as there was no demand) was done prior to implementation. These languages included Thai and Myanmese.

8. "We collaborated with a Singapore-based health-technology start-up" - please give details on how this was done. In the discussion it is also mentioned that "co-design" was used but without any details.
Thank you for the question. We have given further details in lines 136-141 on page 4. We collaborated with a Singapore-based health-technology start-up to develop a mobile health-solution to assist in the remote self-monitoring of vital signs including temperature, heart rate and oxygen saturation. Multiple testing sessions were conducted with dormitory residents by the authors, with iterative improvements deployed by software engineers. Most of these were targeted at improving the user interface to increase its intuitiveness.

9. Accessibility of the app is mentioned, but only language considered. Please consider wider access issues such as mobile access, access to mobile data and potential costs involved?
Almost all dormitory residents had a mobile device. As all workers were gazetted within their dormitories, the Ministry of Health enabled free WiFi access across all dormitories, as well as provide residents with a SIM card with at least 50GB of data. We have added a “setting” section under “Methods” (lines 113-123, pages 3 and 4) to clarify this point.

10. Cost effectiveness - this has only considered app costs for the health system; what about costs for the patient? what about costs to the healthcare system - for example how the remote monitoring fits into the wider healthcare system and review?
This intervention was provided at no cost to the residents. The app costs were covered by a collaborative grant aimed at innovative solutions to aid the COVID-19 pandemic. Internet access was freely available in isolation areas of the dormitory. We have clarified this in line 118, page 4. A cost-effectiveness analysis has not been performed. This study was done following an urgent need to reduce the burden on hospitals while ensuring safety of the COVID-positive dormitory residents. We will aim to perform a thorough cost-analysis subsequently.

11. Although the paper discusses diversity, this sample was fairly homogenous. All male; mostly Bangladesh and India. This could be highlighted plus a better description of the healthcare access of these men to understand the context.
Thank you for pointing this out. We agree that the sample was homogenous and have removed the word “diverse”. We had intended to illustrate that this population is completely different from the population outside dormitories, and hence strategies to ensure their needs are met must be different. Regarding the description of healthcare access: Residents in COVID-19 isolation facilities in the dormitory saw a doctor once a day with no after office hours cover. The chat assistant was developed as a platform to extend the medical coverage remotely beyond what could be provided. We have included this in line 82-83 on page 3.

12. "We performed a prospective study on the implementation and feasibility" - I do not agree that this paper is about implementation or feasibility. There are no frameworks that would usually frame implementation questions. I would say instead that this is a descriptive piece on uptake of a technology for remote monitoring of COVID.
We agree with this point as mentioned above under points 2 and 3 and have removed the word feasibility from the manuscript.

13. Table 2 is first placed mentioned that only one dormitory was asked about "Chest pain or breathlessness*" - this should be mentioned in the methods. Why was the response rate so low?
We only reported people who answered “Yes”. Everyone else answered “No”. We have included this in the methods section (line 161, page 4). For clarification, we have also included the number of patients who responded “No” in table 2.

14. "The uptake rate was 85.9% across both dormitories."- is this for patients that used the app once? or number of times you wanted a measurement? This is not clear.
We defined uptake rate as the total number of residents registered on the VSM platform with at least one reading, over the total number of residents with COVID-19 (line 212, page 6).
15.Limitations do not report the usual potential issues with self-reported measurements. How accurate were the measurements? There are questions that we cannot know as no data on patient experience was collected - e.g. were patients fearful of putting a number that was high or low? Any concern about being removed from the dormitory etc? This is a limitation of the study.
Thank you for highlighting this valid concern and limitation. We have included it in our discussion (lines 321-330, page 8).

16. there was no research checklist in the materials provided
We have filled out a research checklist and attached it with the re-submission. Thank you for pointing out this omission.

VERSION 2 – REVIEW

REVIEWER	Osama El Shamy Vanderbilt University Medical Center
REVIEW RETURNED	28-Nov-2020

GENERAL COMMENTS	Thank you very much for your revisions. I am satisfied with your answers and the changes you made to the manuscript.

REVIEWER	Elizabeth Sturgiss Monash University, Australia
REVIEW RETURNED	11-Nov-2020

GENERAL COMMENTS	Thank you for clearly responding to the last set of comments. I have some further comments and points for clarification. 1. This is not a cohort study - it is a retrospective review of medical care. Please revise this in the title and throughout the paper. 2. Abstract - please review the 85.9% uptake - it is not "uptake" in the sense that the app was used as intended, but 85.9% of patients used the app at least once. 3. Please outline how the authors are also the physicians involved; this could be in the methods but should also be considered in the conflict of interest section. 4. Thank you for clarifying how the mobile phone numbers were used. "Identifiers were removed and the data anonymised for the purpose of data analysis" - how was this done? Please add more detail. 5. Suggest take out reference to "implementation" - there is no implementation framework etc. 6. Thank you for the clarification about patient privacy - I was considering the privacy of the patient from others in the dormitory room. Can you please add this to the methods? I'm assuming that

	the patient did not have privacy from other patients in the dormitory? This is an important part of the description of the intervention. 7. On page 6, there is a dot point called cost effectiveness, but this does not relate to cost effectiveness (i.e. the cost of the intervention in relation to the effectiveness or outcome), this would seem to be better labelled "cost of the app" 8. Uptake is misleading the reader "The uptake rate was 85.9% across both dormitories". In the abstract, text this should be re-written as 85.9% of patients used the app at least once. If you can then comment on how many used it as often as was intended, that would be helpful. 9. Table 2 reinforces this misleading message about uptake - this is the number of single instances of the app being used; it is more helpful to know how many patients used it the number of prescribed times. This table should have a different heading and be clearer - at the moment the reader has to work out exactly what "uptake" is referring to. Currently "uptake" means "used once" which is very different from a patient adhering to the recommended use over time.

VERSION 2 – AUTHOR RESPONSE

We are immensely grateful for the reviewers' efforts to improve our manuscript. Please find our responses below.

1. This is not a cohort study - it is a retrospective review of medical care. Please revise this in the title and throughout the paper.

Thank you for your feedback. We have revised in the title and throughout the paper.

2. Abstract - please review the 85.9% uptake - it is not "uptake" in the sense that the app was used as intended, but 85.9% of patients used the app at least once.

We agree with the reviewer's comments. The abstract has been revised to:

Outcomes: The primary outcome measure was engagement rate.

Results: 800 of the 931 COVID-19-affected residents (85.9%) engaged with the platform to log a total of 12,511 discrete episodes of vital signs.

3. Please outline how the authors are also the physicians involved; this could be in the methods but should also be considered in the conflict of interest section.

We understand and appreciate the concern raised by the reviewer. We have updated the methods (lines 233-236, page 6) to state:

The authors of this paper were voluntarily involved in the enhancement and deployment of the platform to provide clinical care to patients in a setting in which no infrastructure existed. The primary objective was to enable care provision. There was no direct involvement by the chatbot developer in the study or manuscript.

Given that the primary purpose was to provide care to patients, we do not believe that there was a conflict of interest from the authors.

4. Thank you for clarifying how the mobile phone numbers were used. "Identifiers were removed and the data anonymised for the purpose of data analysis" - how was this done? Please add more detail.

For the purpose of data analysis, data extracted were deidentified. Patients were assigned sequential numbers in ascending order based on their mobile number, following which, the mobile number was removed from the dataset used for analysis. The study team did not have access to the re-identification key.

5. Suggest take out reference to "implementation" - there is no implementation framework etc.

Thank you for your suggestion. We agree and have removed this.

6. Thank you for the clarification about patient privacy - I was considering the privacy of the patient from others in the dormitory room. Can you please add this to the methods? I'm assuming that the patient did not have privacy from other patients in the dormitory? This is an important part of the description of the intervention.

Thank you for the clarification. We have added to the description in the methods (line 202-206, page 5): “It was not possible to ensure privacy from other residents in the shared dormitory room due to isolation policies and strict movement restrictions in place in isolation areas. Residents were aware of this limitation before starting the video consult.”

7. On page 6, there is a dot point called cost effectiveness, but this does not relate to cost effectiveness (i.e. the cost of the intervention in relation to the effectiveness or outcome), this would seem to be better labelled "cost of the app"

Thank you for highlighting this. We agree and have changed the wording to “cost” alone (line 150).

8. Uptake is misleading the reader "The uptake rate was 85.9% across both dormitories". In the abstract, text this should be re-written as 85.9% of patients used the app at least once. If you can then comment on how many used it as often as was intended, that would be helpful.

We have changed this to engagement rate throughout the manuscript. As we expect patients to use the app daily, Figure 1 shows an approximation of the proportion of patients who used it as often as was intended. We are unable to report the exact uptake rate, for reasons that we have added to the limitations section (lines 330-335, page 8). “Thirdly, while our data showed good engagement rate, we were unable to report the exact uptake rate as some patients continued to report their vital signs even after transferring out of the dormitory, or were transferred out at different times in the day, resulting in a dynamic denominator over a single day. The daily patient numbers were collected at the start of the day, before transfers in and out of the isolation areas.”

9. Table 2 reinforces this misleading message about uptake - this is the number of single instances of the app being used; it is more helpful to know how many patients used it the number of prescribed times. This table should have a different heading and be clearer - at the moment the reader has to work out exactly what "uptake" is referring to. Currently "uptake" means "used once" which is very different from a patient adhering to the recommended use over time.

Thank you for pointing this out. We agree. Please see answer to section 8 for our response to this comment. We have also amended the phrasing of ‘uptake’ in table 1 to engagement.

VERSION 3 – REVIEW

REVIEWER	Elizabeth Sturgiss Monash University, Australia
REVIEW RETURNED	22-Dec-2020

GENERAL COMMENTS	Thank you for this version of the manuscript. - STROBE guideline for cohort studies. The editor should decide if they are happy to accept this guideline as this is not a cohort study