PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Impact of a teaching hospital based multidisciplinary telemedicine program in Southwestern Colombia: A cross sectional resource analysis.
AUTHORS	Prada, Sergio Iván; Toro, José Joaquín; Peña-Zárate, Evelyn E.; Libreros-Peña, Laura; Alarcón, Juliana; Escobar, Maria Fernanda

VERSION 1 – REVIEW

REVIEWER	Kim, Joosup Monash University, Medicine, School of Clinical Sciences
REVIEW RETURNED	12-Feb-2024

GENERAL COMMENTS	General: There are several typographical errors that need to be address. These include, but are not limited to: - 'hypotetical' should be 'hypothetical' page 4 - 'patient' should be 'patients' page 4 - 'factor de expansion' mentioned page 5 - redundant 'across' page 5 - redundant 'con' page 7 - missing 'burden' page 13 Please use decimal places instead of commas. Abstract: - Costs are stratified by patients' place of residence. The names of the categories should be described different to avoid confusion. The authors use the 'entire country of Columbia' as a category, but this would include Cali and Valle del Cauca as well? Perhaps the categories could be "Cali", "Valle del Cauca excluding Cali", "outside of Valle del Cauca". Methods: - Perhaps a map of the study area would be helpful. Is it possible to overlay this with the residences of the sampled patients? - Some explanation of the study area would be helpful. It might appear to a reader that people are travelling to this hospital from all over Columbia. Perhaps the categories could be "Cali", "Valle del Cauca excluding Cali", "outside of Valle del Cauca". - Please provide more context around hospitals in the region. I would assume there are some other hospitals apart from FVL in the region and people living outside of Cali would typically just go

	to their local hospital instead? Please also provide details of how the referral system to FVL works. - Please provide more explanation about the sample size calculation. How was it determined that only 814 people were required for this study? - Please explain how is it that these 814 had 1708 teleconsultations? How would these consultations typically be provided (or how were they provided previously)? Presumably patients would have a number of follow-up consultations - over what period of time would these consultations be provided? - Please explain more detail about how the telemedicine service is organised. Do patients dial in from home? How does the service work for patients who have difficulties due to poor technological literacy or cognitive problems? How do patients provide their medical information to the healthcare professional? - What is SAP? - Was age taken into consideration when calculating loss of productivity? If there are patients who are quite elderly, there would not be any costs associated. - A simple exchange rate has been used, but it may be more appropriate to use the purchasing power parity conversions instead. Results - Tables 1 and 2 are not particularly helpful. Perhaps Table 1 could be moved to the supplement. The age and sex reported in Table 2 could be just reported in text, but perhaps it would be better to have compare the age, sex and type of consultations between the sampled patients and the other patients to determine the reliability of the random sampling. Also a comparison of patient characteristics and type of consultation by region would be helpful. - A histogram for the number of consultations would be more meaningful than showing the number of consultations by category. Discussion - Strengths and limitations should be discussed. Notably one of the things that could have been taken into account was the employment status of patients. - Please discuss whether there are other consequences of having telemedicine services - like increased costs related to more consultations and associated testing and health services provided. - Please discuss how a cost effectiveness study (looking into telemedicine against a comparator) is required in order to truly understand the value for money that this intervention provides.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1:

- **Comment #1:** There are several typographical errors that need to be address. These include, but are not limited to:

  - 'hypotetical' should be 'hypothetical' page 4

  - 'patient' should be 'patients' page 4

  - 'factor de expansion' mentioned page 5

  - redundant 'across' page 5

  - redundant 'con' page 7

  - missing 'burden' page 13 – “burden of disease” page 15

  Response to Reviewer 1 Comment #1: Thank you for bringing this to our attention. We have thoroughly reviewed the manuscript and made the necessary corrections to address the typographical errors. In addition, we have performed a grammar and spelling check in English to ensure the accuracy and clarity of the text.

- **Comment #2:** Please use decimal places instead of commas

  Response to Reviewer 1 Comment #2: Thank you for your feedback. We have made the necessary corrections to use decimal places instead of commas throughout the manuscript.

- **Comment #3:** Costs are stratified by patients' place of residence. The names of the categories should be described different to avoid confusion. The authors use the 'entire country of Columbia' as a category, but this would include Cali and Valle del Cauca as well? Perhaps the categories could be "Cali", "Valle del Cauca excluding Cali", "outside of Valle del Cauca".

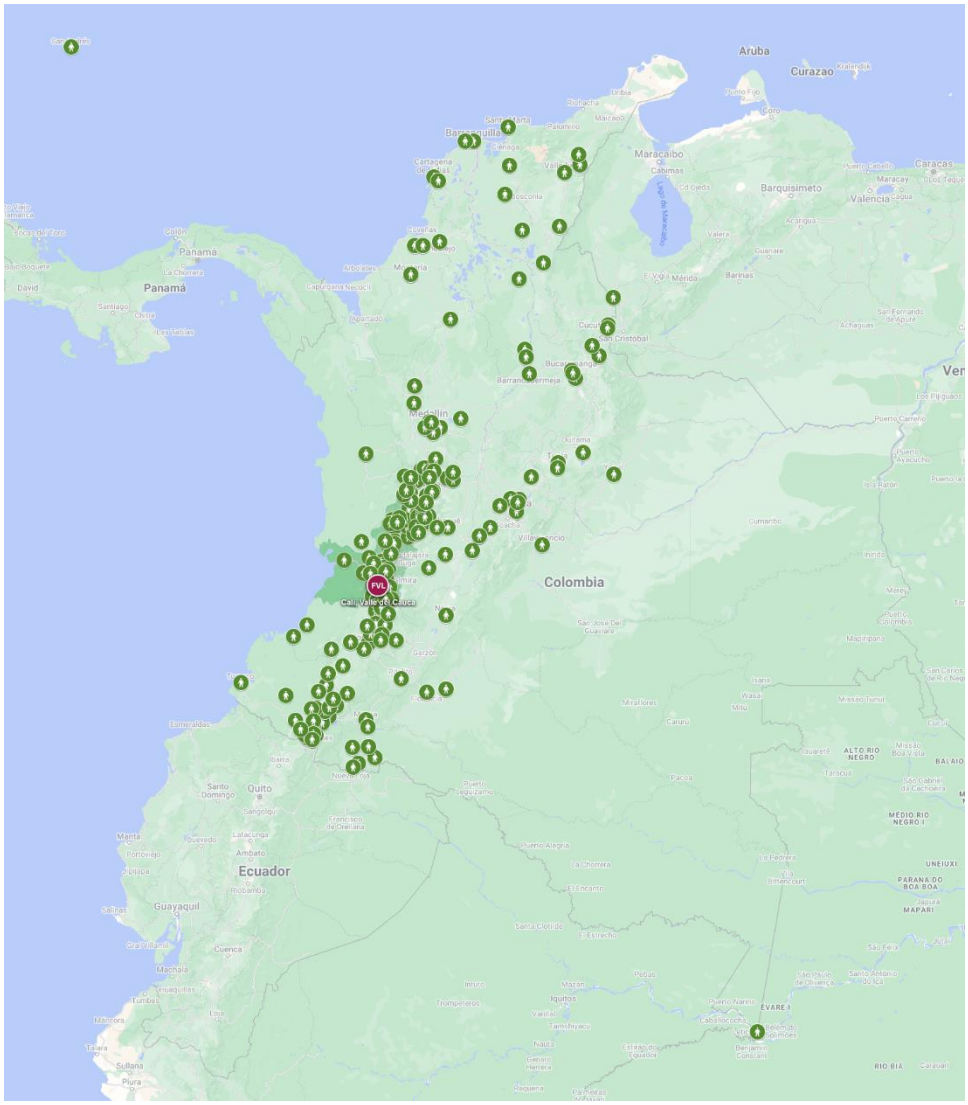
  Response to Reviewer 1 Comment #3: Thank you for your suggestion. We agree with your recommendation to modify the names of the categories to avoid confusion. We have made the necessary changes, and the categories are now defined as "Cali", "Valle del Cauca excluding Cali", and "Outside of Valle del Cauca". Methods section on page # 4-5.

- **Comment #4:** Perhaps a map of the study area would be helpful. Is it possible to overlay this with the residences of the sampled patients?

  Response to Reviewer 1 Comment #4: Thank you for your suggestion. We have created a map of Colombia for our study, which includes the location of the Fundación Valle del Lili (FVL) and

overlays the areas of residence of the patients who were attended through teleconsultation. This addition provides valuable spatial context and demonstrates the reach of our program.

Where the change was made in the text: Methods section, page 6.



Green shaded area refers to the region of Valle del Cauca. Red point indicates Fundación Valle del Lili (FVL). Green points represent areas of teleconsultation in Cali, Valle del Cauca excluding Cali, and areas outside of Valle del Cauca

Figure 1. Study area map with locations of patient residences.

- **Comment #5:** Some explanation of the study area would be helpful. It might appear to a reader that people are travelling to this hospital from all over Columbia. Perhaps the categories could be "Cali", "Valle del Cauca excluding Cali", "outside of Valle del Cauca".

Response to Reviewer 1 Comment #5: Thank you for your feedback. We have addressed your concern by adding a map of Colombia indicating the residential locations of individuals who were attended via teleconsultation during the study period. Additionally, we would like to provide further context regarding Fundación Valle del Lili (FVL). FVL is a high-complexity reference center and one of the 16 accredited university hospitals recognized by the government, serving as a hub for specialized medical expertise. It's important to note that in Colombia, access to specialized care is often authorized through health insurance plans, which determine patient referral and treatment based on contractual agreements. While there are indeed other hospitals in the region, FVL stands out due to its capacity for comprehensive care and specialization, attracting patients from both Cali and surrounding areas.

Additionally, we have revised the group names to provide clearer categorization for the reader, now distinguishing between "Cali", "Valle del Cauca excluding Cali", and "outside of Valle del Cauca". These changes aim to enhance the clarity and comprehensibility of the study area for readers.

Where the change was made in the text: Methods, Overview of the Fundación Valle del Lili Telemedicine Program, pages 6 - 7.

- **Comment # 6:** Please provide more context around hospitals in the region. I would assume there are some other hospitals apart from FVL in the region and people living outside of Cali would typically just go to their local hospital instead? Please also provide details of how the referral system to FVL works.

Response to Reviewer 1 Comment #6: Thank you for your insightful observation and valuable comments. It is worth noting that major cities in Colombia, such as Bogotá, Cali, and Medellín, commonly host Level III and IV hospitals, which offer comprehensive medical services to the surrounding population. FVL operates at Level IV, boasting subspecialized personnel and advanced technology. Conversely, smaller cities and towns may have Level I and II hospitals, providing care of basic to moderate complexity. Patients typically need authorization from their healthcare plan to access specialist care. The healthcare entity then determines the care location based on contractual agreements, often encompassing telemedicine services within the health plan coverage; therefore, it is not the patient who has the option to choose their place of treatment.

Where the change was made in the text: Methods, Overview of the Fundación Valle del Lili Telemedicine Program, page 8.

Change to the text: Change to the text: "In Colombia, hospitals are categorized into four levels based on their degree of specialization, subject to evaluation and approval by the national government. Level I hospitals primarily have low-complexity technology and provide care by general practitioners, offering outpatient consultations, hospitalization, emergency services, and essential diagnostic and treatment support. Level II hospitals expand their services to include gynecology and obstetrics, surgery, internal medicine, and pediatrics, incorporating technology of moderate complexity. Level III hospitals feature subspecialized personnel, adult and neonatal intensive care units, and advanced technology. At the highest level of care, Level IV hospitals cater to patients in critical condition, offering highly complex subspecialties and the potential for organ transplantation (12).

Moreover, it is noteworthy that the 3 largest cities in Colombia, Bogotá, Medellín, and Cali, concentrate the majority of Level III and IV hospitals in the country, providing comprehensive medical services to the surrounding population. Additionally, Colombia boasts only 16 government-accredited teaching hospitals, representing hubs of specialist concentration. Access to specialist care in Colombia's healthcare system requires authorization from the patient's healthcare plan, as patients cannot freely choose their own specialist. The patient healthcare plan assigns the care location based on contractual agreements, with telemedicine services typically included within the health plan. Conversely, smaller cities and towns may house Level 1 and 2 hospitals, offering care of basic to moderate complexity (12).

Fundación Valle del Lili (FVL) is a private, non-profit, high-complexity hospital located in Santiago de Cali, serving as a referral center in the southwest region of Colombia. In 2019 the institution provided 511,124 outpatient visits, 75,890 ER visits and 26,878 inpatient stays. FVL's telemedicine service, promoted and strengthened in March 2020 in response to the declaration of a health emergency by COVID-19 by the Ministry of Health, ensures the continuity of ambulatory health services throughout the Colombian territory. This initiative aims to address accessibility challenges, particularly in rural regions, by extending high-level medical services to remote areas. Through a robust referral and counter-referral mechanism, eligible patients requiring outpatient or home-based

management can access specialized consultations, facilitating consultation scheduling and ensuring necessary care irrespective of geographic location."

- **Comment #7:** Please provide more explanation about the sample size calculation. How was it determined that only 814 people were required for this study?

  Response to Reviewer 1 Comment #7: thank you for you comment, The sample size formula for the population mean was employed, without finite population correction, considering a margin of error of 0.5 km and a standard deviation of 7 km, resulting in 753, However, to ensure adequate statistical power the sample size was increased by 8% to 814 participants. With a 95% confidence interval, the following formula was utilized for the sampling calculation:n=[Z_alpa/2 Sigma/Error]^2.

  Where the change was made in the text: Methods, page 5.

  Change to the text: Change to the text: "The sample size of patients for the city of Cali was determined based on the formula for estimating the mean of a population with a specified margin of error of 0.5 km, a standard deviation of 7 km, and Z=1.96 for a 95% confidence interval. Rounding up to the nearest whole number to ensure an integer sample size, the calculated sample size was 753. This calculation did not correct for the finite population correction factor as the population size was large relative to the sample size (N=19 630). However, to ensure adequate statistical power the sample size was increased by 8% to 814 participants."

- **Comment #8:** Please explain how is it that these 814 had 1708 teleconsultations? How would these consultations typically be provided (or how were they provided previously)? Presumably patients would have a number of follow-up consultations - over what period of time would these consultations be provided?

  Response to Reviewer 1 Comment #8: We employed an interval period spanning from April to December 2020. It's essential to clarify that the total number of teleconsultations (1708) does not equate to the number of unique patients (814). A single patient might undergo multiple consultations and follow-up appointments within this interval, contributing to the observed increase in consultation numbers. This pattern is consistent with standard healthcare practices, where patients often require ongoing follow-up appointments to monitor their progress or adjust treatment plans. Typically, these

consultations are provided over several months, depending on the patient's medical condition and treatment regimen. Each teleconsultation session serves as an opportunity for healthcare professionals to assess the patient's health status, address any concerns or issues, and make any necessary adjustments to their care plan. We have included a clarification in the revised manuscript

Where the change was made in the text: Methods, page 5.

Change to the text: “This resulted in a total of 1 708 teleconsultations in the selected sample, indicating that a single individual may have undergone multiple consultations and follow-up appointments throughout the study period. These consultations represented 3.9% of the 44,182 teleconsultations conducted in this group. As a result, calculations for the total savings in this group were later extrapolated by multiplying the value obtained in the sample by 25.87.”

- **Comment #9:** Please explain more detail about how the telemedicine service is organised. Do patients dial in from home? How does the service work for patients who have difficulties due to poor technological literacy or cognitive problems? How do patients provide their medical information to the healthcare professional?

Response to Reviewer 1 Comment #9: Thank you for your comment. We have provided additional clarification regarding the organization of the telemedicine service in the revised manuscript. Patients access the service by scheduling appointments via telephone during designated hours. They can dial in from home or any location with internet access, allowing for convenient remote consultations. For patients facing challenges due to poor technological literacy or cognitive issues, assistance is available during the appointment booking process. Additionally, receptionists provide support during the teleconsultation setup, guiding patients on using the institutional application for initiating the call.

Where the change was made in the text: Methods, Overview of the Fundación Valle del Lili Telemedicine Program, page 7-8.

Change to the text: “FVL's telemedicine service facilitates outpatient care across 64 medical specialties, employing an interactive modality that establishes remote communication between patients and healthcare professionals through real-time video calls.. FVL's telemedicine service is meticulously

organized to ensure seamless access to outpatient care for patients. The process begins with appointment scheduling via telephone, available from Monday to Friday between 7 a.m. and 5 p.m., and on Saturdays from 8 a.m. to 1 p.m. Patients are carefully guided through administrative procedures, supplemented by instructional emails detailing telemedicine processes. Appointment confirmations are diligently conducted 24 hours in advance by verifying the submission of requisite documents to the designated email address. Teleconsultations and real-time video calls are facilitated through the Microsoft Teams platform. Patient data is recorded in the Enterprise Resource Planning systems of the hospital (SAP-IS-H Software), which host the electronic medical record. Following the consultation, a PDF containing consultation details, medical directives, and prescriptions is dispatched to the patient's email address. Patients who have difficulty due to low technology literacy or cognitive issues are assisted by the appointment agent during the booking process. Additionally, the receptionist provides support during the teleconsultation setup, including guidance on using the application for initiating the call."

- **Comment # 10:** What is SAP?

  Response to Reviewer 1 Comment #10: SAP, which stands for Systems, Applications & Products in Data Processing, is a renowned enterprise resource planning (ERP) software system extensively utilized by organizations to streamline diverse facets of their business operations. These encompass finance, human resources, procurement, manufacturing, supply chain management, among others. Within the realm of healthcare services, SAP serves as an electronic medical record system. It efficiently organizes and maintains comprehensive patient medical records, encompassing vital data such as patient demographics, medical history, diagnoses, treatments, and prescribed medications.

  Where the change was made in the text: Methods, Overview of the Fundación Valle del Lili Telemedicine Program, page 8.

  Change to the text: "Teleconsultations and real-time video calls are facilitated through the Microsoft Teams platform. Patient data is recorded in the Enterprise Resource Planning systems of the hospital (SAP-IS-H Software), which host the electronic medical record. Following the consultation, a PDF containing consultation details, medical directives, and prescriptions is dispatched to the patient's email address."

For more context and information about SAP healthcare software click in this link: https://help.sap.com/doc/8f97dd61e46e44d5bc752feab199377b/6.00.29/en-."

- **Comment #11:** Was age taken into consideration when calculating loss of productivity? If there are patients who are quite elderly, there would not be any costs associated.

  Response to reviewer #1 Comment #11:

  Thank you for your comment. We include all age groups, from pediatrics to older adults, recognizing that each group entails associated costs in terms of transportation and time, especially if they need to travel to Fundación Valle del Lili. However it is a limitation In our study.

  Where the change was made in the text: Methods, Outcome measures, page 10.

  Change to the text: "Potential loss of productivity: It pertains to the value of work time that the patient would have lost due to the round-trip travel required for in-person consultations. This particularly affects the adult population aged between 21 and 61 years. Additionally, the retirement age in Colombia for women is 57 years and for men is 62 years. Within the scope of the study, this constitutes a limitation as it was not measured."

- **Comment #12:** A simple exchange rate has been used, but it may be more appropriate to use the purchasing power parity conversions instead.

  Response to reviewer #1 Comment 12: Thank you for your comment. We changed the information with the Purchasing Power Parity Exchange

  Where the change was made in the text: page 10

  Change to the text: All costs were calculated with the Purchasing Power Parity Exchange rate of 1 370.9 COP per USD as per CCEMG–EPPI Centre Cost Converter' (v.1.7 last update: January 2024) (https://eppi.ioe.ac.uk/costconversion/) designed to facilitate international comparison of costs. (Shemilt I, James T, Marcello M. A web-based tool for adjusting costs to a specific target currency and price year. Evid Policy [Internet]. 2010;6(1):51–9. Disponible en: http://dx.doi.org/10.1332/174426410x482999)

- **Comment #13:** Tables 1 and 2 are not particularly helpful. Perhaps Table 1 could be moved to the supplement. The age and sex reported in Table 2 could be just reported in text, but perhaps it would

be better to have compare the age, sex and type of consultations between the sampled patients and the other patients to determine the reliability of the random sampling. Also, a comparison of patient characteristics and type of consultation by region would be helpful.

Response to reviewer #1 Comment 13: Thank you for your feedback. We have implemented your suggestions, which include moving Table 1 to the supplement and restructuring Table 2 (now table 1 with the changes) to facilitate comparisons by region for patient characteristics and types of consultations.

- **Comment #14:** A histogram for the number of consultations would be more meaningful than showing the number of consultations by category.

Response to reviewer #1 Comment 14: Thank you for your valuable input. We acknowledge your suggestion regarding the presentation of consultation data. In response, we have generated a histogram illustrating the frequency of visits per patient, aiming to enhance the clarity and interpretability of the data. Your feedback has been instrumental in improving our presentation approach.

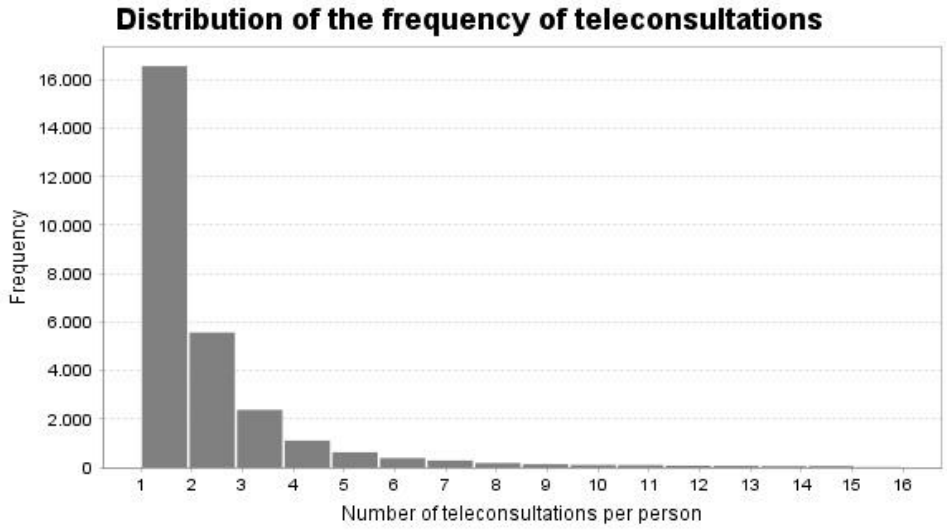


Figure 2. Distribution of the frequency of teleconsultations per person.

- **Comment #15:** Strengths and limitations should be discussed. Notably one of the things that could have been taken into account was the employment status of patients.

  Response to reviewer comment #15: Thank you for your helpful comment. We agree that one limitation of the study, attributable to its type and design, was the omission of the employment status of the patients. We have discussed our limitations and strengths in our revised manuscript.

  Where the change was made in the text: Discussion, page 17-18.

  Change to the text: "The study also overlooked critical factors like internet usage and telecommunications connectivity, impacting the assessment of cost savings achieved through telemedicine adoption. Failure to consider participants' transportation mode and employment status hindered insights into socioeconomic dynamics influencing telemedicine utilization. Methodologically, the indirect calculation of expenditures introduced ambiguity, compounded by the absence of a validated instrument for precise measurement."

- **Comment #16:** Please discuss whether there are other consequences of having telemedicine services - like increased costs related to more consultations and associated testing and health services provided.

  Response to reviewer comment #16: Thank you for raising an important point. In Colombia, diagnostic and treatment services are fully covered by the national healthcare system. Under this system, patients make a predetermined payment and, as a benefit, receive the aforementioned services. Thus, any increase in cost would not be borne by the patient or the hospital, but rather by the healthcare system. However, it is important to note that a limitation of the study is the lack of measurement of such consequences and costs.

  Where the change was made in the text: Discussion, page 17.

  Change to the text: "On the other hand, the Colombian healthcare system fully covers diagnostic and treatment services, which may mitigate the cost impact on patients or hospitals. However, the study did not measure these consequences and costs, which is a limitation."

- **Comment #17:** Please discuss how a cost effectiveness study (looking into telemedicine against a comparator) is required in order to truly understand the value for money that this intervention provides.

Response to reviewer #1 comment #17: Thanks for this comment. The reviewer is right in that a CE analysis is the next logical step in a full economic evaluation. Adding a comparator would help achieving a better understanding of the impacts of telemedicine. In general previous studies have found that despite the costs to implement and maintain a telemedicine program, from the health care system perspective, telemedicine programs still remain cost-effective (**Ricci RP, Vicentini A, D'Onofrio A, Sagone A, Rovaris G, Padeletti L, Morichelli L, Fusco A, De Vivo S, Lombardi L, Denaro A, Pollastrelli A, Colangelo I, Santini M. Economic analysis of remote monitoring of cardiac implantable electronic devices: Results of the Health Economics Evaluation Registry for Remote Follow-up (TARIFF) study. Heart Rhythm. 2017 Jan;14(1):50-57. doi: 10.1016/j.hrthm.2016.09.008.**) in the developed world. In developing countries a literature review for Asian countries **(Salsabilla A, Azzahra AB, Syafitri RIP, Supadmi W, Suwantika AA. Cost-Effectiveness of Telemedicine in Asia: A Scoping Review. J Multidiscip Healthc. 2021;14:3587-3596 https://doi.org/10.2147/JMDH.S332579)** concluded that "The implementation of telemedicine in Asia can be a promising intervention since it can enhance the effectiveness of health services by saving time and travel costs. It also can reduce the overall costs of treatment, improve patients' quality of life, and expand access to essential health services."

The comparator in all these studies was current status (without telemedicine) and several studies used math modelling. The literature is not yet settled in that regard because it depends on the context and field within medicine (i.e, Cardiology, Physical Rehabilitation, etc). We have added the following text to clarify this in the limitations section of the paper.

Where the change was made in the text: Discussion, page 18.

Change to the text: "Our objective in this paper was measuring savings using TM in comparison to a regular visit by the patient to our location, we did not seek a full economic evaluation which will include a cost-effectiveness (CE) study. The CE literature has shown that from a health systems

perspective telemedicine programs remain cost-effective, but from a societal perspective there is a gap, and we leave a full economic evaluation for further research."

VERSION 2 – REVIEW

REVIEWER	Kim, Joosup Monash University, Medicine, School of Clinical Sciences
REVIEW RETURNED	05-Apr-2024

GENERAL COMMENTS	Well done to the authors on submitting a much improved manuscript. I still have some mostly minor comments/questions below. Abstract "Areas with exclusive air access achieved a mean cost savings of $362.92 USD per teleconsultation." What kind of savings? Strengths and limitations I would not start each bullet point with "a strength/limitation of this study is.." I think the rest of the sentences are clear enough for readers to discern if it is a strength of limitation. Please check with the editor and other BMJ Open publications. Methods In their responses to comments, the authors have provided information about hospitals nearby to FVL, I would Figure 1. If possible, I would recommend a greyscale map and smaller symbols to indicate the location of patients. I still do not understand the sample size calculations. The authors mention 'adequate statistical power' - for what statistical test? There is no statistical analysis section. Would it be appropriate to move the information related to sample size calculations (if relevant) towards the end of the methods (perhaps before ethics approval). Outcome measures - it would assist the readers to have the calculation immediately after the description of each type of outcome. For loss of productivity. it would make more sense to explain the limitation further in the discussion.

VERSION 2 – AUTHOR RESPONSE

Reviewer 1:

Well done to the authors on submitting a much improved manuscript. I still have some mostly minor comments/questions below.

- **Comment #1:** “Areas with exclusive air access achieved a mean cost savings of $362.92 USD per teleconsultation." What kind of savings?

  Response to Reviewer 1 Comment #1: The average savings of $362.92 USD per teleconsultation in areas with exclusive air access refers specifically to the money saved on transportation. This value does not include the "potential loss of productivity" and only represents the direct economic savings associated with transportation expenses.

  Where the change was made in the text: Abstract, results, page 2.
  Change to the text: “... Areas with exclusive air access achieved a mean cost savings of $362.9 USD per teleconsultation, specifically related to transportation costs.”

- **Comment #2:** I would not start each bullet point with "a strength/limitation of this study is." I think the rest of the sentences are clear enough for readers to discern if it is a strength of limitation. Please check with the editor and other BMJ Open publications.

  Response to Reviewer 1 Comment #2: Thank you for your suggestion, we have decided to take it into account in our manuscript and have made the pertinent adjustments in the section.

  Where the change was made in the text: Strengths and limitations, page 3.

  Change to the text:

  “This study originates from a database rich in georeferenced information for each patient.

  The study utilizes actual costs of public and intermunicipal transportation for each individual in the dataset.

  Individual preferences for public or private transportation were not accounted for in this study.

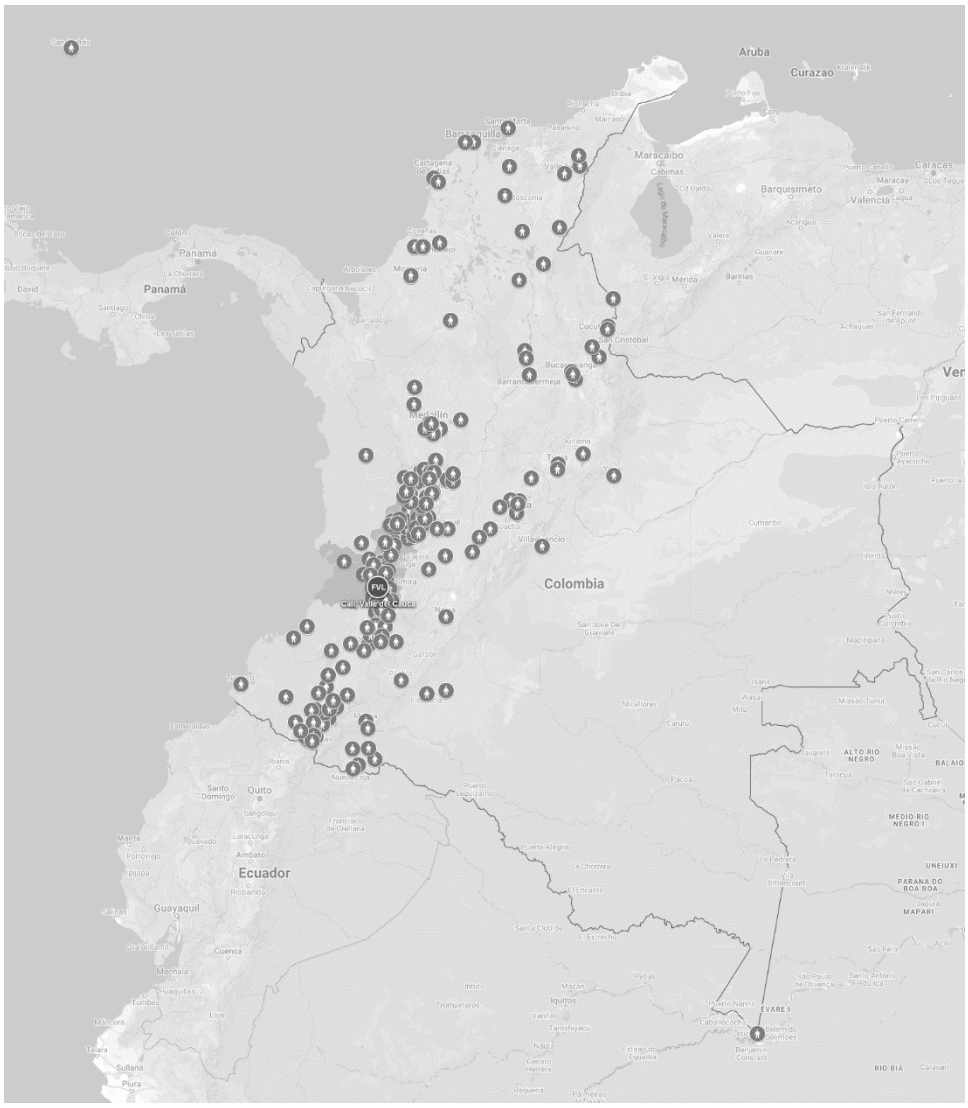
  Productivity loss estimation did not consider the employment status of participants.

  The measured calculations are indirect since there is no validated instrument available to measure individuals' expenditure costs.”

- **Comment #3:** In their responses to comments, the authors have provided information about hospitals nearby to FVL, I would

  Figure 1. If possible, I would recommend a greyscale map and smaller symbols to indicate the location of patients.

Response to reviewer 1 comment #3: thank you for your comment we changed the figure to greyscale:



Grey shaded area refers to the region of Valle del Cauca. Black point indicates Fundación Valle del Lili (FVL). Grey points represent areas of teleconsultation in Cali, Valle del Cauca excluding Cali, and areas outside of Valle del Cauca

- **Comment #4:** I still do not understand the sample size calculations. The authors mention 'adequate statistical power' - for what statistical test? There is no statistical analysis section.

  Response to Reviewer 1 Comment #4: Thanks, we agree that it needs more clarification. The reason why we needed a sample is because we did not have the money to pay the charges for the 19 630 distance calculations for the city of Cali, for which we had exact street addresses. According to the engineers we consulted to get an exact estimation between two addresses taking

into account traffic and real routes we needed to use software that charged per estimation (with only the first 10 for free). For towns and cities outside of Cali we used the center of the town to our address in Cali and replicated it for all patients. So we use the Minimum Sample Size for Estimating a Population Mean ($n=(Za/2)^2o^2/E^2$)

With zα/2 determined by a 95% level of confidence (parameter = 1.96), a standard deviation of 7 km and a marging of error (E) of 0.5 km. Following the formula, N= was estimated to be 753, but wanted to have more data to increase precision and accuracy, and used an ad-hoc 8%.

Where the change was made in the text: Methods, Design and population, page 5.

Change to the text: To estimate distance per-patient-per-trip for patients outside the city of Cali but with land access to the city we used the distance between the center of the town and the exact address at Fundación Valle del Lili using available free software. For patients without land access distance was not computed. For patients in the city of Cali, an exact street address to street address estimation was done with the help of specialized software that takes into account traffic and real routes. This however was costly to do for the 19630 patients, so we estimated a sample of 753 using the formula for a minimum sample size for estimating a population mean with 95% level of confidence (parameter = 1.96), a standard deviation of 7 km and a marging of error (E) of 0.5 km. This calculation did not correct for the finite population correction factor as the population size was large relative to the sample size An extra 8% of patients were added to complete a sample of 814, allowed by the budget allocated to this task, increasing precision and accuracy."

- **Comment #5:** Would it be appropriate to move the information related to sample size calculations (if relevant) towards the end of the methods (perhaps before ethics approval).

  Response to Reviewer 1 Comment #5: Thank you for your suggestion. We have taken it into account and relocated the information regarding sample size calculations towards the end of the methods section, as you recommended on page number 9.

- **Comment #6:** Outcome measures - it would assist the readers to have the calculation immediately after the description of each type of outcome. For loss of productivity. it would make more sense to explain the limitation further in the discussion.

  Response to Reviewer 1 Comment #6: Thank you for your comment, we described it in the discussion section.

  Where the change was made in the text: methods section page 9 and discussion section page 17

  Change to the text:

  Methods section:

Travel time savings: Measurements of car transportation were performed using Google Maps, taking the main FVL center as the destination and the patient's place of residence as the origin. The patient's home address was defined by the address (for Cali residents) or the registered municipality of residence in the electronic medical record system. The car transport option and the quickest route were selected. The estimated distance and travel time were doubled to encompass the round-trip travel to and from the FVL.

Travel cost savings: Fuel cost calculation: We took as a reference the cost per gallon of fuel reported by the Ministry of Mines and Energy for the year 2020 that was $8 268 COP ($2.24 USD); and an average consumption of 40 km traveled per gallon.

Fuel cost saved=(Round trip distance (km))/(40 (km))*$ 8 268

Calculation of public transportation cost savings: To calculate the cost public transportation for the population living in Cali, we considered the cab fare reported by the Cali Municipal Hall for the year 2020, which was $84 COP for each 80 meters traveled. For residents in other areas of Valle del Cauca and Colombia, we searched on the virtual platforms of the country's public transportation terminals to determine the fare cost of inter-municipal bus travel from the different localities to the city of Cali.

It should be highlighted that for the municipalities where river transportation is necessary, the travel cost and time required for each municipality were consulted, in addition to the cost and time of land transportation. For the municipalities that do not have land access, estimates were made of the airfare costs, these were excluded in the calculations of distance and time savings.

Discussion section:

Additionally, the potential loss of productivity particularly affects the adult population aged between 21 and 61 years. The retirement age in Colombia for women is 57 years and for men is 62 years. Within the scope of the study, this constitutes a limitation as it was not measured.

VERSION 3 – REVIEW

REVIEWER	Kim, Joosup Monash University, Medicine, School of Clinical Sciences
REVIEW RETURNED	18-Apr-2024

GENERAL COMMENTS	No further comments.