PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Health service needs and perspectives of a rainforest conserving community in Papua New Guinea's Ramu lowlands: a combined clinical and rapid anthropological assessment with parallel treatment of urgent cases
AUTHORS	Middleton, Jo; Colthart, Gavin; Dem, Francesca; Elkins, Alice; Fairhead, James; Hazell, Richard; Head, Michael; Inacio, Joao; Jimbudo, Mavis; Jones, Christopher; Laman, M.; MacGregor, Hayley; Novotny, Vojtech; Peck, Mika; Philip, Jonah; Paliau, Jason; Pomat, William; Stockdale, Jessica; Sui, Shen; Stewart, Alan; Umari, Ruma; Walker, Stephen; Cassell, Jackie

VERSION 1 – REVIEW

REVIEWER	Guerrero, Anthony University of Hawaii, Psychiatry
REVIEW RETURNED	16-Jul-2023

GENERAL COMMENTS	I appreciate the opportunity to review this manuscript, which describes a highly impressive, timely, and impactful study. I had only a few comments, purely for the authors' and editors' consideration, and purely from the perspective of an unfamiliar reader (with apologies in case some of these items were present but missed): 1) It may be helpful to provide more details, in this manuscript, on the linguistic diversity in the region studied, and confirm that the languages used in the study were fully sufficient for the purposes. 2) If space allows, it may be helpful to show a picture of a bandicoot (one of the hunted animals). 3) In helping the reader to assess the feasibility of telemedicine support to a posted health aide, it may be helpful to provide more details on the technology available and the extent and quality of communications signals in the region. 4) It may be helpful to comment on the degree to which the COVID-19 pandemic impacted upon procedures and findings. Once again, thank you for the privilege of being able to review this manuscript.

REVIEWER	Macniven, Rona UNSW, School of Public Health and Community Medicine
REVIEW RETURNED	24-Jul-2023

GENERAL COMMENTS	This is a comprehensive article describing the process and outcomes of community driven health assessments in a very remote village. The findings have already been used to advocate for community health funding which is admirable.

	In the abstract, there does not seem to be a relevant section to define the category of 'well' that is indicated in the results but a brief indication of how this category was given would be helpful. It is not clear in the Results section either and would be important to understand the sociocultural as well as medical basis behind the term in this context, and reflect on in the Discussion. The final abstract sentence 'In doing so, it has aided Wanang's community to develop sustainably, without sacrificing their forest home' sounds very important but the points raised are not previously indicated and could be added to the Objective. The first paragraph of the Introduction describes an outcome of the study, this would be better placed in the Discussion section. Are there relevant or national epidemiological data that could be described for the region the study took place in? Understanding that there are no local data that is reflected on in the Discussion.

VERSION 1 – AUTHOR RESPONSE

REVIEWER 1
RI: *"I appreciate the opportunity to review this manuscript, which describes a highly impressive, timely, and impactful study."*
RESPONSE: We are grateful for your positive evaluation of our study and your description of it as "a highly impressive, timely, and impactful study." Thank you.

RI: *"I had only a few comments, purely for the authors' and editors' consideration, and purely from the perspective of an unfamiliar reader (with apologies in case some of these items were present but missed)"*

RESPONSE: We list below, point-by-point, the changes we have made in response.

R1: *"It may be helpful to provide more details, in this manuscript, on the linguistic diversity in the region studied, and confirm that the languages used in the study were fully sufficient for the purposes."*

RESPONSE: Thank you for this very helpful comment which we are sure will aid the reader. To provide more details on the linguistic diversity in the study area we have inserted new text and additional references (15 and 16) in the methods section (lines 157-164 in tracked version, inserted text in [square brackets]):

'Digitally recorded FGs were held separately by sex-age… in Tok Pisin (PNGs national creole). Similarly, interviews and clinical assessments, unless participants preferred English. Recordings were transcribed verbatim in Tok Pisin, then translated into English. [The tok ples (meaning local language in Tok Pisin) of Wanang is Magi, which is unique to the Wanang area.[15] Part of the Aisian language group of the Trans-New Guinea family, Magi is largely mutually intelligible with neighbouring Aisi,[15] which is also the mother tongue of some Wanang villagers. In addition, a handful of Kalam people from Simbai settled in the community over a decade previously and speak Etp (also Trans-New Guinean[16]). Our assumption when designing the study was that most potential participants would understand either spoken Tok Pisin or English, and we planned that RTs would arrange translation by key informants for those who only spoke a tok ples (presumed to be a small minority).[4]]'

(4) Middleton J, Abdad MY, Beauchamp E, et al. Health service needs and perspectives of remote forest communities in Papua New Guinea: study protocol for combined clinical and rapid

anthropological assessments with parallel treatment of urgent cases. BMJ Open 2020;10:e041784. https://doi.org/10.1136/bmjopen-2020-041784

(15) Daniels D. Magi: An undocumented language of Papua New Guinea. Ocean Linguist 2016;55:199–224 PubMed .

(16) Pawley A, Hammarström H. The Trans New Guinea family. In: Palmer B, ed. The Languages and Linguistics of the New Guinea Area : A Comprehensive Guide. Berlin: De Gruyter 2017: 21–196.

We have also added new text into the participants section of the results to report that the languages used in the study were fully sufficient for the purposes (lines 232-235 in tracked version, inserted text in [square brackets]):

'[Our linguistic expectations were borne out during data collection. Most participants understood and spoke Tok Pisin, a small number preferred to talk with us in English, and translation support for local languages was only required for a few villagers (mostly from older age groups).] Quotes in roman typeface are translated from Tok Pisin (dual transcripts retained), those in italics are written as spoken.'

R1: *"If space allows, it may be helpful to show a picture of a bandicoot (one of the hunted animals)."*

RESPONSE: We appreciate this suggestion, it hadn't occurred to us that readers unfamiliar with Oceania may not know what a bandicoot is (or somewhat worse maybe, confuse it with the unrelated 'bandicoot' rat from India, China etc.). As suggested, we have now added a picture of a bandicoot. We have inserted it into figure 1 with the following text in the figure descriptor, 'New Guinea common spiny bandicoot (*Echymipera kalubu*)' and in-text signposting as follows (line 330, insrted text in [square brackets]):

'An agronomy trained RT noted *"almost everyone makes garden and continues to live a subsistence life"*, and counted 20 crops under cultivation, supplemented by hunting wild pigs and bandicoot [(figure 1)], and fishing.'

R1: *"In helping the reader to assess the feasibility of telemedicine support to a posted health aide, it may be helpful to provide more details on the technology available and the extent and quality of communications signals in the region."*

RESPONSE: We agree this detail will aid the reader. We have added the following into the summary of the community health plan (Box 1, i.e. line 689, in tracked version, inserted text in [square brackets]):

'In addition, the nurse should facilitate childhood vaccinations, and pregnancy and emergency birth care (with telemedicine-based support [when available]). [To enable the latter, the aid post should have a mobile phone (with solar charging) with which to seek advice from obstetrics at Madang hospital when sufficiently timely evacuation is not available. The recently introduced mobile coverage of the area remains weak and patchy, so the aid post should be sited in the highest part of the settlement to maximise reception.]'

As we have now mentioned some communication methods, for completeness we have also added the following text (Box 1, i.e. line 689 tracked version) about High Frequency radio (though it unfortunately cannot be used for communication with the hospital):

'[On-road evacuation from trailheads can be provided by Binatang Research Centre when possible, with the pre-existing good quality High Frequency radio link between the centre and Wanang maintained to support this.]'

R1: *"It may be helpful to comment on the degree to which the COVID-19 pandemic impacted upon procedures and findings."*

RESPONSE: Thank you for this suggestion. We have added new sub-sections in both the methods and discussion in response. The new text in the methods section reads (lines 212-218 in tracked version, inserted text in [square brackets]):

'[**COVID-19**
COVID-19 did not affect data collection or most analysis as they were conducted prior to the pandemic, as was our subsequent obtaining of funding for health service introduction (outlined in the discussion section of this paper). However, secondment of multiple co-authors to national level public health responses delayed writing up for journal publication. In addition, inter- and intra- national travel restrictions delayed further community health assessments with conservation communities elsewhere in PNG (specifically on Mount Wilhelm [4]).]'

The new text added into the discussion section is as follows, with a new reference (46) also added into the article (lines 625-641 in tracked version, inserted text in [square brackets]):

'[*COVID-19*

Two authors of this paper (ML, WP) have co-authored with colleagues a report assessing COVID-19 impacts on PNG's primary health services and public health infectious disease programs.[46] One key identified theme at a national level is especially relevant to the local findings and recommendations of our study. Newland et al.[46] found the scaling back of some services and reduced ability to travel to facilities for both staff and those seeking medical services (particularly during lockdowns) impacted access to and continuity of care. However, locally in our study area, during the pandemic access to and continuity of care increased due to the operationalising of a key study recommendation, that permanent primary care be established for the Wanang area. When the aid post opened (November 2020) few cases had been seen nationwide compared to many other countries at the time, and it was prior to PNG's two main waves of COVID-19 infections and death (both in 2021).[46] Continuity of care amidst the pandemic was mainly possible because the nurses lived amongst the people they treated. Other approaches we considered, such as only providing medical patrols from outside the area, may have served the communities less well in the context of a pandemic when many mobile health programs closed due to workforce re-tasking and restrictions on travel.[46] As of August 2023, no cases of COVID-19 have been identified in Wanang, but this is not verifiable due to limitations on testing capacity in PNG.]'

(46) Newland J, Neuendorf N, Vallely L, et al. COVID-19 and its impacts on primary health services and public health infectious disease programs in Papua New Guinea. Goroka and Sydney: PNGIMR and UNSW 2022. http://dx.doi.org/10.26190/6mhp-gc18

R1: *"Once again, thank you for the privilege of being able to review this manuscript."*

RESPONSE: We very much appreciate your helpful comments, which will significantly improve the article for the benefit of the reader. Thank you again.

REVIEWER 2

R2: *"This is a comprehensive article describing the process and outcomes of community driven health assessments in a very remote village. The findings have already been used to advocate for community health funding which is admirable."*

RESPONSE: We are grateful for your positive evaluation of our study and your description of it as a "*comprehensive article describing the process and outcomes of community driven health assessments in a very remote village*." Thank you.

We appreciate the time you have put into considering and commenting on our manuscript, and we list below, point-by-point, the changes we have made in response.

R2: *"In the abstract, there does not seem to be a relevant section to define the category of 'well' that is indicated in the results but a brief indication of how this category was given would be helpful. It is not clear in the Results section either and would be important to understand the sociocultural as well as medical basis behind the term in this context, and reflect on in the Discussion."*
RESPONSE: Thank you for this helpful steer which will aid the reader. We have inserted additional text in the abstract, in method, in results, and discussion, as follows.

In the abstract (lines 45-46 in tracked version, inserted text in [square brackets]):

'Of 113 examined, 11 were classified as 'well', [a clinical impression based on declarations of no current illness, medical histories, conversation, no observed disease signs.]'

In methods we have added text to make signposting more prominent for the related primary care assessment questionnaire and data collection form in the supplementary material of the studies protocol paper which is already published in BMJ Open (lines 167-169 in tracked version, inserted text in [square brackets], deleted text ~~strikethrough~~):

'Our protocol's supplementary file[17] includes: [focus group and key informant interview] topic guides; [participant information sheets and] consent [forms]; ~~and clinical~~ [our primary care assessment questionnaire and] data collection form~~s~~; treatment formulary and equipment; safety measures.'

In results (lines 299-301 in tracked version, inserted text in [square brackets]):

'The next largest grouping was 'well', an evaluation given to just 11 of 113 examined (9.7%). [This was a clinical impression based primarily on self/parent declarations of no current illness, but also appraisal of medical histories, conversation with the persons, and not observing signs of disease.]'

New text in discussion 1 of 2 (lines 520-541 in tracked version, inserted text in [square brackets]) and new references 29-33:

'[Some who participated in primary care assessments were classified as 'well', a clinical impression based primarily on self/parent declarations of no current illness (i.e., answering "nogat" ['no'] to the question "Yu gat sampela sik nau yet?" ['Do you currently suffer from any illness?']), but also appraisal of medical histories, conversation with the persons, and not observing signs of disease. In Tok Pisin one might say 'malaria I kisim em, tassel nau i orait gen' ('he had malaria, but now he's well again' [23]). It is broadly in this vein we are using 'well'. We do not mean it in the more holistic sense, such as that signalled by the WHO definition of health ('complete physical, mental and social well-being and not merely the absence of disease'[29]), nor have we attempted to create an ethnoclassification ofhat it means in Wanang to be 'well'. Instead, we just mean a clinical impression of absence of disease (expressed or observed). This narrow usage, similar in form to 'Sick/Not Sick' in emergency patient assessment,[30] was appropriate given our main objective in conducting primary care assessments was to determine disease burdens at the community level, as part of planning health service introduction. Others have investigated and discussed ways communities in PNG socio-culturally understand concepts translatable to well-being or health, and how they relate to biomedical ideas (for example, see [31–33]). Especially pertinent, given our aim to support a locally driven sustainable development pathway, is the expansive view of another forest people of PNG, the Huli. According to a letter co-authored by one of their community: 'if their environment is not considered healthy, so the community and each individual in itself are not healthy… According to the Huli conceptions, health is not limited to their bodies, it encompasses their land and all that surrounds them.'[33] Determining how people at Wanang understand what it means to them to be well/healthy would be useful (particularly to support long-term health promotion activities), but it was beyond the narrow remit or capacity of this rapid needs assessment.]'

(29) WHO. Constitution of the World Health Organization. Available at: https://www.who.int/about/governance/constitution (accessed 10 August 2023).

(30) Helbock M. Sick Not Sick: A guide to rapid patient assessment. Sudbury, MA: American Academy of Orthopaedic Surgeons and Jones and Bartlett 2000.

(31) Hinton R, Earnest J. Assessing women's understandings of health in rural Papua New Guinea: Implications for health policy and practice. Asia Pac Worldview 2011;52:178–193 PubMed . https://doi.org/10.1111/j.1467-8373.2011.01449.x

(32) Koczberski G, Curry GN. Sik Bilong Ples: an Exploration of Meanings of Illness and Well-Being Amongst the Wosera Abelam of Papua New Guinea. Aust Geogr Stud 1999;37: 230–247 PubMed . https://doi.org/10.1111/1467-8470.00081

(33) Charlier P, Coppens Y, Malaurie J, et al. A new definition of health? An open letter of autochthonous peoples and medical anthropologists to the WHO. Eur J of Intern 2017;37:33–37 PubMed . https://doi.org/10.1016/j.ejim.2016.06.027.

In discussion 2 of 2 (lines 672-674 in tracked version, inserted text in [square brackets]):

'Unanswered questions and future research
Long-term ethnography could improve understanding of disease ethnoclassifications, especially beyond the 'top four'[, and explore local ideas related to biomedical conceptions of health].'

R2: *"The final abstract sentence 'In doing so, it has aided Wanang's community to develop sustainably, without sacrificing their forest home' sounds very important but the points raised are not previously indicated and could be added to the Objective."*

RESPONSE: We thank the reviewer for their helpful comment. We have as suggested added reference to this into the objective in the abstract, which now reads (line 36 in tracked version, inserted text in [square brackets]):

'Determine community needs and perspectives as part of planning health service incorporation into Wanang Conservation Area[, in support of locally driven sustainable development].'

For consistency, we have also added new text into the aims in the introduction. This now reads (lines 130-131 in tracked version, inserted text in [square brackets]):

'We aimed to plan health service incorporation into the conservation collaboration[, to support a locally driven sustainable development pathway.]'

R2: *"The first paragraph of the Introduction describes an outcome of the study, this would be better placed in the Discussion section."*

RESPONSE: We have moved the relevant sentence from the introduction to the discussion as recommended by the reviewer (now placed at lines 492-494 in the tracked version).

R2: *"Are there relevant or national epidemiological data that could be described for the region the study took place in? Understanding that there are no local data that is reflected on in the Discussion."*

RESPONSE: We agree with the reviewer that contextualising our community-based findings with wider epidemiological data from the region would aid the reader. Unfortunately, relevant or national epidemiological data for the region the study took place in is sparse beyond a few high-priority diseases which are the subject of vertical programmes. That which does exist is mostly biased towards urban areas and those villages easily accessible by road. As of 2023 PNG may be the least urbanised country on earth, and our study site is set far from urban areas and their environs, so this is not ideal. It is similar for demographic data, for example there is ongoing debate about whether PNGs population is c10 million people or c16 million people. Given this situation, in response to your point we have added extensive additional text in the discussion section and six new references. In the first piece of additional text we present relevant reliable contextual data and how it relates to our findings, and also discuss the present limitations of available data and prospects for improvement.

In discussion (lines 544-564 in tracked version, inserted text in [square brackets], deleted text ~~strikethrough~~) with new additional references 34-36 and 38-40:

'Many high burden illnesses [identified in our study] reflect those seen [regionally and] nationwide[. For example, malaria was one of the five most common diagnoses we gave, in the declared medical histories of over half of our participants, and trackable to the highest community-ranked health issue. Beyond Wanang, it is widespread in lowland and coastal provinces, including Madang.[34] In 2021 PNG accounted for nearly 87% of malaria cases and 94% of associated deaths across the entire WHO Western Pacific Region.[35] This is an area of 37 countries and territories in which live 1.9 billion people.[36] Similarly,] ~~(e.g.,~~ GBD 2019 ranks respiratory infection as the leading cause of all-age PNG DALYs.[37] [This chimes with our findings in Wanang that URI and LRTI were two of the five most common diagnoses we gave, and trackable to the second highest community-ranked health

issue (“sotwin”). Unfortunately, beyond select diseases such as malaria that are the target of international action (and therefore have resources allocated to collect well-grounded indicators), there is limited reliable national or province-level statistics available to compare our community-level findings with. This is particularly so re disease prevalence beyond towns and areas well-connected to them by road. To put this in context, in Madang province only an estimated 3% of child births are registered (the lowest in the country),[38] whilst at the other end of life only an estimated 26% of deaths nationally are recorded by health services. Most of these are from urban areas and without medical certification, so not reliable for developing national mortality statistics.[39] Treatment data from a large subset of health centres is in the process of being pooled nationally,[40] but is not yet available for comparison. Likewise at a provincial level, aggregation and digitisation of datum from health facilities across Madang is planned but presently (August 2023) faces logistical issues which mean regional treatment data is also unavailable for comparison.]’

(34)Keven JB, Katusele M, Vinit R, et al. Vector composition, abundance, biting patterns and malaria transmission intensity in Madang, Papua New Guinea: assessment after 7 years of an LLIN-based malaria control programme. Malar J 2022;21:7. PubMed https://doi.org/10.1186/s12936-021-04030-4

(35) WHO. World Malaria Report 2022. Geneva: World Health Organization, 2022.

(36) WHO. Western Pacific Region. Available at: https://web.archive.org/web/20230804152140/https://www.who.int/westernpacific (accessed 4 August 2023).

(37) Institute for Health Metrics and Evaluation. GBD (Global Burden of Disease) Compare Tool, Papua New Guinea. Both sexes, all ages, 2019, DALYs. Washington. https://vizhub.healthdata.org/gbd-compare/ (accessed 21 Oct 2022).

(38) PNG National Statistical Office. Papua New Guinea Demographic and Health Survey 2016–18. Port Moresby and Rockville: NSO and ICF 2019. Available at https://web.archive.org/web/20230801120444/https://dhsprogram.com/pubs/pdf/FR364/FR364.pdf (accessed 3 August 2023).

[39] Hart JD, Kwa V, Dakulala P, et al. How advanced is the epidemiological transition in Papua New Guinea? New evidence from verbal autopsy. I J Epidemiol 2021;50:2058–2069. https://doi.org/10.1093/ije/dyab088

(40) Rosewell A, Shearman P, Ramamurthy S, Akers R. Transforming the health information system using mobile and geographic information technologies, Papua New Guinea. Bull World Health Organ 2021;99:381–387 PubMed . http://doi.org/10.2471/BLT.20.267823

The second part of additional text contextualizes our study findings related to barriers to accessing health facilities with recent data from a survey conducted in the region on women’s access to healthcare (lines 574-579 in tracked version, inserted text in [square brackets], deleted text ~~strikethrough~~):

‘…our results may be usefully indicative of similar settings elsewhere in inland Madang province in communities to which biomedical care remains remote. [Notably, a recent PNG statistical office survey [38] asked women about difficulties accessing healthcare. Across Madang province 77% of rural women respondents 15–49y reported ‘serious problems in accessing health care for themselves’. The leading barriers were needing to get money for treatment (70%), and distance to health facilities (61%). This resonates with our related findings from Wanang. (]For insights into [settings in the region where medicine is less remote, see Street [11] on] relations within and around a hospital in Madang town~~, see Street[11][])]~~.’

Thank you again for your valuable review of our manuscript.

OTHER CHANGES

Minor edits to abstract

As the abstract word-limit is 300 words, we edited it down to enable insertion of the additional details requested by reviewer 2. We do not consider this has resulted in any loss of meaning. It now reads as follows (lines 34-61 in tracked version, inserted text in [square brackets], deleted text ~~strikethrough~~):

'*Objectives*. Determine community needs and perspectives as part of planning health service incorporation into Wanang Conservation Area[, in support of locally driven sustainable development].

Design. Clinical and rapid anthropological assessment (individual primary care assessments, Key Informant [KI] interviews, Focus Groups [FGs], ethnography) with ~~parallel~~ treatment of urgent cases.

Setting. Wanang (pop. c189), a ~~village in the~~ rainforest~~s~~ [community in]~~of~~ Madang province, Papua New Guinea.

Participants. 129 villagers provided medical histories (54 females (f), 75 males (m); median 19y, range 1mo–73y), 113 had clinical assessments (51f, 62m; median 18y, range 1mo–73y). 26 ≥18y participated in sex-age stratified FGs (f<40y; m<40y; f>40y; m>40y). Five KIs were interviewed (1f, 4m). ~~Data collectors recorded~~ [D]~~d~~aily ethnographic fieldnotes[were recorded].

Results. Of 113 examined, 11 were 'well' [(a clinical impression based on declarations of no current illness, medical histories, conversation, no observed disease signs)], 62 (30f, 32m) [were] treated urgently, 31 referred (15f, 16m), indicating considerable unmet need. FGs top-4 ranked health issues concorded with KI views, medical histories, and clinical examinations. For example, ethnoclassifications of three ([a]"malaria", [b]"sotwin", [c]"grile") translated to the five bioedical conditions diagnosed most ([a] malaria, 9 villagers; [b] upper respiratory infection, 25; lower respiratory infection, 10; tuberculosis, 9; [c] tinea imbricata, 15), and were highly represented in declared medical histories ([a] 75 participants, [b] 23, [c] 35). However, 29.2% of diagnoses (49/~~ of~~ 168) were limited to one or two people. Treatment approaches included plant-medicines, stored pharmaceuticals[,] ~~and~~ occasionally rituals. ~~Protracted t~~[T]ravel to hospital/pharmacy was sometimes undertaken for severe/refractory disease. Service barriers included: no health patrols[/]~~ or easily reachable~~[accessible] aid post; remote ~~town~~ hospital; unfamiliarity with institutions; medicine costs. ~~FG s~~[S]ervice introduction priorities were: aid post; ~~child~~ vaccinations; transport; perinatal/birth care; family planning.

Conclusions. [T]~~In a place with no prior health data, t~~his study enabled service planning and demonstrated ~~medical~~ need sufficient to acquire funding to establish ~~local~~ primary care. In doing so, it ~~has~~ aided Wanang's community to develop sustainably, without sacrificing their forest home.'

Tinea Imbricata

We have added new references about tinea imbricata to make it PNG specific, and to aid the reader who is likely to be unfamiliar with the disease.

In results (lines 443-444 in tracked version, inserted text in [square brackets], deleted text ~~strikethrough~~) with additional references 25 and 26:

'Differing within-community susceptibility was also suggested (which is in line with [some, but not all,] observations [from PNG] that predisposition [may] ~~seems to~~ be ~~linked to recessive~~inherited~~ance~~ [24–26]).'

(25) Hay RJ. Genetic Susceptibility to Dermatophytosis. Eur J Epidemiol 1992;8:346–349. https://doi.org/10.1007/BF00158566

[26] Hay RJ. Tinea Imbricata. In: McGinnis MR, ed. Current Topics in Medical Mycology, vol 2. New York: Springer 1988:55–72. https://doi.org/10.1007/978-1-4612-3730-3_3

Figure in-text references and figure descriptors

We have updated in-text figure references throughout, and edited the figure descriptors for figures 1 and 4 as follows (lines 940-946 and 960-967 in tracked version, inserted text in [square brackets], deleted text ~~strikethrough~~):

'Figure 1 Study setting.

A: ~~Wanang community. B:~~ Overgrown logging road on the way to Wanang. [B]~~C~~: Wanang area. [C]~~D~~: Mural honouring the role of aid posts in PNG medicine on the wall of Madang Provincial Hospital. [D]~~E~~ & [E]~~F~~: Examples of individual health books in-use in-region at the time of this assessment. [F: Traditional house in Wanang village. G: New Guinea common spiny bandicoot (*Echymipera kalubu*). ~~[~~CreditImages: A, C, D, E, and F, first author JM; ~~A, New Guinea Binatang Research Centre;~~ [B]~~C~~, co-author JP; [G, Daniel Heuclin (SuperStock), rights retained.]~~ others, first author JM].'~~

Figure 4. Phased health service introduction at Wanang.

~~Top:~~ Examples of training provided[:~~, (left to right)~~ fracture management [(A)], off-road vacuum-stretcher evacuation [(B)]~~, use of malaria RDTs~~. ~~Middle:~~ Wanang Aid Post[, outside (with a northern cassowary (*Casuarius unappendiculatus*) chick]([C)]~~left~~) and [backrooms for] nurse consultation[s] ([D]~~right~~). ~~Bottom:~~ Examples of disease targets for proactive integrated interventions, ~~specifically (left to right)~~ tropical ulcer [(E)], yaws [(F)], tinea imbricata [(G)], scabies mite and eggs [(H)]. Images from [Madang Province in PNG (specifically: A, Baitabag; B, Nagada; C, D, E, F and H,] Wanang~~),~~ apart from *Sarcoptes scabiei* microscopy [(H).] ~~(~~Credit: [A, D, E, F, and H~~top and bottom~~, [first author] JM; [B and G, co-author JAS; C]~~middle~~, [co-author VN]~~Binatang Research Centre)~~.

VERSION 2 – REVIEW

REVIEWER	Guerrero, Anthony University of Hawaii, Psychiatry
REVIEW RETURNED	31-Aug-2023

GENERAL COMMENTS	I am grateful for the opportunity to re-review this very interesting and timely paper. I appreciate all of the revisions in response to my previous feedback and am very pleased to recommend it for publication.