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SUPPLEMENTARY FILE

Middleton, Colthart, Dem, *et al.* 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. Submitted to *BMJ Open* 2023.

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REPORTING**Reporting checklist based on ‘Appraising studies in health using rapid assessment procedures’ [13]**

This checklist is provided in line with the following statement in our protocol: ‘The article will reference this protocol noting changes in method, and include a filled-in reporting checklist based on criteria for appraising studies in health using RAP’ [4]. All changes are noted in the manuscript under the subheader ‘Changes from our published protocol’ in the methods section. Criteria in ‘_’ are quoted from [13].

Criteria	Page, line number
‘1. Aim (Is the aim of the study clearly described?)’	5, 124–127.
‘2. Subjectivity (Are the researchers' background, prior knowledge and relationship to the community, and cultural competence clearly presented and addressed?)’	Paper: 6, 166–171; 7, 185–186; 25, 686–699. Sup. File: 3.
‘3. Field research guidelines (Is there an adequate description of the field guide and the rationale and process of its development?)’	Fully detailed in published protocol, which also includes all recruitment materials, KI and FG topic guides, clinical data collection forms, pharmacy, etc.[4]. Paper: 5–6, 133–142, 161–165.
‘4. Staff (Is the recruitment process and training of research assistants presented, and is it sound?) RAP studies usually use research assistants in the collection of primary data from the field. Many researchers establish specific criteria for selecting assistants and these should be communicated. Further, the training process and content should be presented.’	Detailed in published protocol. Fieldwork RAs were existing RTs and PNG nationals at in-country New Bintang Research Centre. Sup. File: 3.
‘5. Data collection methods (Is the rationale for the data collection methods and types of information collected with each method clearly presented?)’	Detailed in published protocol. Paper: 6, 143–165.
‘6. Selection of research sites (Is an appropriate sampling strategy for selecting the study area(s) or research site(s) described?)’	n/a – site (Wanang village) was studied as it was the community that had requested health service incorporation in their existing conservation area. See 4–5, 80–123; detailed in protocol paper.
‘7. Informant selection (Is a systematic process of selecting informants used and is it adequately described?)’	Fully detailed in published protocol. Paper: 6, 145–148; 7, 199–203.
‘8. Credibility (Is a strategy for assessing credibility established and presented?)’	Fully detailed in published protocol. Paper: 5, 136–137; 6, 173–174; 7, 184–190.
‘9. Analysis (Is the analysis process adequately described and was it sound?)’	Fully detailed in published protocol. Paper: Fig 2; 6–7, 166–190; 7, 203–206. Sup. File: 3.
‘10. Presentation (Are the findings and discussion clearly presented?)’	Paper: 8–21, 219–681. Table 1, Figs. 3 and 4. Sup. File: 3–9, Tables S1–S6.
‘11. Ethics (Are ethical principles respected and is the process for informed consent described?)’	Detailed in published protocol (including recruitment scripts, consent forms etc.). Paper: 25, 701–710.

METHODS

Fieldwork team backgrounds

BSMS: JM is a research fellow in public health with a background in pre-hospital emergency care, including in remote areas, and training in disease ecology and qualitative methods. GC is a general practitioner and experienced expedition medic with training in tropical dermatology. Both had prior field experience in Melanesia (PNG; Solomon Islands). BRC: MJ and SS were research technicians (RTs) with degrees in forestry science who were brought up in rural PNG villages, had previously worked with the community, and had pre-existing skills in social studies. JP is a RT from Wanang, where he continues to live with his family.

Capacity building for PNG staff

RTs were trained in study procedures by JM, provided the protocol [4] and [19] for reference in the field, and gained practical experience working alongside JM and GC who were present during all fieldwork. BRC staff were also given a lecture on conservation and health integration projects worldwide, and a certificated 3-day course on remote care and medical evacuation (taught by JM). FD, ML, JP, SS, and RU were additionally brought to the UK from PNG in 2019 and 2022. There they received training from Brighton and Sussex Medical School and University of Sussex (e.g., project monitoring and evaluation, eDNA, ecological and health analysis) and were taken on institutional visits nationwide (e.g., Millennium Seed Bank, University of Southampton, University of Oxford, London School of Hygiene & Tropical Medicine, Kew) to build their network of collaborators and co-plan future PNG-led work.

Generating combined all-group rankings

We generated combined all-group rankings of health issues and priorities for health service introduction by adding together inversely weighting ranks from sex-age focus groups. For example, two groups ranked malaria highest, another second highest, and the remaining as fifth highest: (1st=5) + (1st=5) + (2nd=4) + (5th=1) = 15. This was the largest combined score, so malaria was reported as the overall highest ranked health issue.

RESULTS

Supplementary Table S1. Primary care assessment participants.

		Medical History (n=129) (%)	Examined (n=113) (%)
Sex	Female	54 (41.9)	51 (45.1)
	Male	75 (58.1)	62 (54.9)
Age in years	0–9	50 (38.8)	45 (39.2)
	10–19	21 (16.3)	15 (13.3)
	20–29	9 (7.0)	7 (6.2)
	30–39	18 (14.0)	16 (14.2)
	40–49	10 (7.8)	9 (8.0)
	50–59	17 (13.2)	17 (15.0)
	60–69	2 (1.6)	2 (1.8)
	70–79	2 (1.6)	2 (1.8)
	Median (range)	19y (1mo–73y)	18y (1mo–73y)

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Supplementary Table S2. Diagnoses from clinical examinations in Wanang village

Specific clinical diagnoses are listed in descending order and categorised as per the International Classification of Diseases 11th Revision Version 02/2022 (ICD-11, <https://icd.who.int/browse11/l-m/en>), followed by the relevant ICD-11 primary code when appropriate. For example, 'Yaws' is listed as a specific condition, and as a sub-category of 'Certain infectious or parasitic diseases'. Diagnoses were recoded to ICD-11 by author JM and confirmed by author GC. Percentages are of examined males/females/all, totals are greater than n as many of those examined had multi-morbidity. In this table, preserving order of individual conditions based on their frequency only allows partial grouping by ICD-11 primary categories. However, figure 3 in the main article shows full grouping by primary categories (but not break down by sex). Five young children (all male) of the 113 individuals examined were only partially examined, due to non-compliance.

Conditions, as per International Classification of Diseases 11th Revision Version 02/2022 (ICD-11) (ICD-11 code) [authors additional information]	ICD-11 Primary category (ICD-11 code) [authors additional information]	Males N=62 (%)	Females N=51 (%)	All N=113 (%)
Acute upper respiratory infection, site unspecified (CA07.0)	Diseases of the respiratory system (ICD 12)	9 (14.5)	16 (31.4)	25 (22.1)
Other specified dermatophytosis (1F28.Y) [Tinea Imbricata]	Certain infectious or parasitic diseases (ICD 01)	11 (17.8)	4 (7.8)	15 (13.3)
Well *		5* (8.1)	6* (11.8)	11* (9.7)
Lung infections (CA4Z) [lower respiratory tract] †	Diseases of the respiratory system (ICD 12)	4 (6.5)	6 (11.8)	10 (8.8)
Malaria	Certain infectious or parasitic diseases (ICD 01)	4 (6.5)	5 (9.8)	9 (8.0)
Tuberculosis, unspecified (1B1Z) ‡		4 (6.5)	5 (9.8)	9 (8.0)
Low back pain (ME84.2)	Symptoms, signs or clinical findings, not elsewhere classified (ICD 21)	6 (9.7)	2 (3.9)	8 (7.1)
Anaemias or other erythrocyte disorders, unspecified (3A9Z) §	Diseases of the blood or blood-forming organs (ICD 03)	2 (3.2)	5 (9.8)	7 (6.2)
Stunting in infants, children or adolescents (5B53) ¶	Endocrine, nutritional or metabolic diseases (ICD 05)	3 (4.8)	3 (5.9)	6 (5.3)
Tropical phagedaenic ulcer (EA40)	Diseases of the skin (ICD 14)	4 (6.5)	1 (2.0)	5 (4.4)
Osteoarthritis, unspecified (FA0Z)	Diseases of the musculoskeletal system or connective tissue (ICD 15)	2 (3.2)	3 (5.9)	5 (4.4)
Chronic obstructive pulmonary disease, unspecified (CA22.Z) ¶¶	Diseases of the respiratory system (ICD 12)	4 (6.5)	1 (2.0)	5 (4.4)
Presbyopia (9D00.3)	Diseases of the visual system (ICD 9)	5 (8.1)		5 (4.4)
Diseases of the urinary system, unspecified (GC2Z) - Lower urinary tract (XA34X0)	Diseases of the genitourinary system (ICD 16)	3 (4.8)	1 (2.0)	4 (3.5)
Pain in joint (ME82)	Symptoms, signs or clinical findings, not elsewhere classified (ICD 21)	2 (3.2)	1 (2.0)	3 (2.7)
Excessive weight loss (MG43.5)		1 (1.6)	2 (3.9)	3 (2.7)
Cough (MD12)			2 (3.9)	2 (1.8)
Fever of other or unknown origin (MG26)		1 (1.6)	1 (2.0)	2 (1.8)
Pityriasis versicolor (1F2D.0)	Certain infectious or parasitic diseases (ICD 01)	1 (1.6)	1 (2.0)	2 (1.8)
Yaws (1C1D) Δ			2 (3.9)	2 (1.8)
Dysmenorrhoea (GA34.3)	Diseases of the genitourinary system (ICD 16)		2 (3.9)	2 (1.8)
Heavy menstrual bleeding (GA20.50)			2 (3.9)	2 (1.8)
Thyrotoxicosis (5A02)	Endocrine, nutritional or metabolic diseases (ICD 05)	1 (1.6)	1 (2.0)	2 (1.8)
Dermatoses provoked by friction or mechanical stress (EH92) - Abrasion (XJ652)	Diseases of the skin (ICD 14)	1 (1.6)	1 (2.0)	2 (1.8)
Strain or sprain of wrist (NC54.6)	Injury, poisoning or certain other consequences of external causes (ICD 22)	2 (3.2)		2 (1.8)
Post traumatic wound infection, not elsewhere classified (NF0A.3)		2 (3.2)		2 (1.8)
Dislocation or strain or sprain of joints or ligaments of the knee (NC93) **		2 (3.2)		2 (1.8)
Strain or sprain of other or unspecified parts of knee (NC93.7)		1 (1.6)		1 (0.9)
Strain or sprain of shoulder joint (NC13.5)		1 (1.6)		1 (0.9)
Laceration without foreign body of ankle or foot (ND12.0)		1 (1.6)		1 (0.9)

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Pain, unspecified (MG3Z)	Symptoms, signs or clinical findings, not elsewhere classified (ICD 21)	1 (1.6)	1 (0.9)
Other chest pain (MD30.1)		1 (1.6)	1 (0.9)
Chronic primary visceral pain (MG30.00)			1 (2.0)
Splenomegaly, not elsewhere classified (ME10.01) [resolved]		1 (1.6)	1 (0.9)
Diarrhoea (ME05.1)		1 (1.6)	1 (0.9)
Abdominal or pelvic pain (MD81)			1 (2.0)
Subcutaneous swelling, mass or lump of uncertain or unspecified nature (ME61) - Iliac region (XA0NH8)			1 (2.0)
Scabies (1G04) §§	Certain infectious or parasitic diseases (ICD 01)	1 (1.6)	1 (0.9)
Other and unspecified infestation by parasitic worms (1F90) ††		1 (1.6)	1 (0.9)
Molluscum contagiosum (1E76)		1 (1.6)	1 (0.9)
Pyogenic abscess of the skin (1B75.3)			1 (2.0)
Persistent Postural-Perceptual Dizziness (AB32.0)	Diseases of the ear or mastoid process (ICD 10)	1 (1.6)	1 (0.9)
Personal history of maltreatment (QE82) - adult (XT6S) [domestic]	Factors influencing health status or contact with health services (ICD 24)		1 (2.0)
Myopia (9D00.0)	Diseases of the visual system (ICD 09)	1 (1.6)	1 (0.9)
Talipes equinovarus (LB98.00)	Developmental anomalies (ICD 20)	1 (1.6)	1 (0.9)
Unspecified asthma (CA23.3)	Diseases of the respiratory system (ICD 12)	1 (1.6)	1 (0.9)
Sleep-related leg cramps (7A82)	Sleep-wake disorders (ICD 07)	1 (1.6)	1 (0.9)
Inguinal hernia (DD51) - Left (XK8G)	Diseases of the digestive system (ICD 13)	1 (1.6)	1 (0.9)
Gastro-oesophageal reflux disease (DA22)			1 (2.0)
Malunion of fracture (FB80.7) - Fracture of upper end of ulna (NC32.0)	Diseases of the musculoskeletal system or connective tissue (ICD 15)		1 (2.0)
Depressive disorders, unspecified (6A7Z)	Mental, behavioural or neurodevelopmental disorders (ICD 06)		1 (2.0)
Lower limb varicose veins, not further specified (BD74.1Z)	Diseases of the circulatory system (ICD 11)		1 (2.0)
Atrial fibrillation (BC81.3)		1 (1.6)	1 (0.9)
Physical maltreatment (PJ20)	External causes of morbidity or mortality (ICD 23)	1 (1.6)	1 (0.9)
Totals of diagnosed morbidities *		92	76
			168

*Well' classifications (marked in green) were not included in the final calculations of total diagnoses of morbidities. The following individual diagnoses were classified by the examining primary care clinician (GC) as "possible" or "suspected": † Lung infections [lower respiratory tract], 3 of 10; ‡ Tuberculosis, unspecified, 8 of 9; § Anaemias or other erythrocyte disorders, unspecified, 5 of 7; || Stunting in infants, children or adolescents, 3 of 6; ¶ Chronic obstructive pulmonary disease, unspecified, 2 of 5; Δ Yaws, 1 of 2; ** Dislocation or strain or sprain of joints or ligaments of knee, 1 of 2; †† Other and unspecified parasitic worms, 1 of 1; §§ Scabies, 1 of 1; ||| Physical maltreatment, 1 of 1.

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Table S3. Ethnoclassification taxonomy of “Malaria” (1st in combined group rankings).

Quotes in roman are translated from Tok Pisin (dual transcripts retained), quotes in italics were spoken as written. Attributed texts without quotation marks are from patient histories summarised by PNG research technicians at the time.

Names	"Malaria" (Tok Pisin and English) (all)						
Who	Everyone All Focus Groups [FG] agreed: "Everyone" (♂≥40y FG)		Old People and young children "It occurs a lot in young school children" (Key Informant [KI]) • "Most of the time it's old people, and young children." (KI)				
When	All the time • "malaria can occur at any time" (♂≥40y FG) • "It's all the time. In the dry season, still there are mosquitoes, in the rainy season – same" (♂<40y FG)			More in the rainy season "Mostly in wet season. So if it rains more, you see more malaria?" (KI)			
Cause	Animal blood "They might bite our skin... in this way the skin has the same blood... they take it from pigs or dogs or whatever and come back and put it into men's skin." (♂<40y FG)	Mosquito eggs "mosquito's eggs will stay inside them and that causes this" (♀<40y FG)	Mosquitos [local name: "nagi"] Sleeping in the open • "Sleeping in the open" (♀<40y FG) • "Not having a mosquito net" (♀≥40y FG) • "maybe they don't sleep in a mosquito net" (KI)		Bushy "It all grasses near their house." (KI)	Swampy "Swampy areas are a breeding place for mosquitos" (KI)	Rubbish "Tins and plastics... create a breeding place for mosquitos" (KI)
Signs and symptoms	• High fever • shivers • cold skin • yellow skin • strong head pain • feel weak • cannot walk • dizziness • vomiting • joint pain • cough • tired • "skin becomes yellow, they will be ill in the afternoon and morning. They sleep. They will be shivering" (♀<40y FG) • "fever, shivers, headache, cough, cold skin" (♂≥40y FG) • "they feel cold, their hairs will be standing on end, very weak" (♂<40y FG) • "cold sickness" (♀≥40y FG) • "Chill, when they are feeling chill, high fever, sometimes they feel dizzy, dizziness, and they tend to vomit regularly...we suspect that they have malaria, by looking at those signs." (KI) • Strong head pain, very high fever, joint pain, vomiting, very weak (Parent [P] of 13y with confirmed malaria) • Cough (P 7y, confirmed malaria) • Head pain, high fever, weak (P 1y, confirmed malaria) • Head pain, feeling cold, fever (P 8y, confirmed malaria) • Can't walk properly (P 4y, confirmed malaria)						
Treatment	Nothing/rest • "In this community... they don't go look for treatment... they are sick they just stay in their bed rest until they... feel good, better... maybe two or three weeks after they become ill again, because the bacteria is in their body and it's not dead." (KI) • "A lot of the time we just stay here, and the illness goes and, like it finishes on its own" (♂≥40y FG)	Pharmacy drugs Chloroquine Paracetamol Amoxicillin • "When you go to town or hospital they take them, and BRC sometimes sends supplies here" (♂<40y FG) • "Panadol, bought from pharmacy" (P 4y, confirmed malaria) • "Panadol, Chloroquine, Amoxicillin" (♀<40y FG)	Steam with medicine from the forest* Papaya Grass Guava Ginger Citrus fruits • "We... take grass smell, guava, citrus fruits, boil them, heat water really hot, go to bedside, cover them up, and steam" (♀≥40y FG) • "We use steam - make hot water - cover them up with a bed sheet, find a large pot, stir it with a stick: Papaya leaves, grass leaves, grass smell, guava leaves, ginger, citrus fruits. Only a few people in the community know how to use it - he knows how to do that. Vines no... drinks no, only steam. When finished, we can wash them using cold water" (♂<40y FG) • "We tend to use medicine from the forest - like tree leaves, papaya... You steam them, cook all of these tree leaves up and steam the body" (♂≥40y FG)	Hospital • "the hospital will treat" (♀<40y FG) • "when they get worse they call the Binatang people so when they have the trip coming up they will just go down to the hospital." (KI)	Comfort "Rock cradle them allot" (♀<40y FG)	Private health care staff Private doctor (P 7y, confirmed malaria)	

*Similar community plant-usage for “malaria” has been reported elsewhere in PNG. For a useful summary (though one that does not evaluate effectiveness) see: WHO. Medicinal plants of Papua New Guinea. Manila: World Health Organization Western Pacific Region 2009.

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Table S4. Ethnoclassification taxonomy of “Sotwin” (2nd in combined group rankings)

Quotes in roman are translated from Tok Pisin (dual transcripts retained), quotes in italics were spoken as written. Attributed texts without quotation marks are from patient histories summarised by PNG research technicians.

Names	<div>“Sotwin” (all)</div> <div>Symptomatic labelling beyond asthma</div> <div>“Umbang aul” (Local language) (♂ <40y FG)</div>						
	<div>Tok Pisin</div> <div>‘1.out of breath, to gasp for breath, to pant; 2. to have asthma’ [23]</div>	<div>Given the dual meaning as biomedical condition and symptom (see left), people were likely sometimes describing experiences of other conditions beyond asthma, particularly when no individual clinical diagnosis had been previously available. • “I don’t know what – is it TB or, we have TB or just asthma or, that’s hard to know... If we have... medical report, like most – like at least medical patrol team they go to the Wanang and then they can inform us “you have TB or, just a cough”” (Key Informant [KI]) • 50y patient (PT), complained of “Sotwin”, diagnosed on assessment with TB.</div>					
Who	<div>“Everybody/Everyone”</div> <div>• “Everybody/Everyone” Focus Groups [FG]: ♀ <40y; ♂ ≥40y; ♂ <40y)* • “asthma is covering all the living people in Wanang, ... from the kids up to the old people.” (KI) • “cold/cough, “sotwin”, they are very widespread inside Wanang... not just older men or women.” (KI)</div> <div>>5y, especially children</div> <div>“especially like kids, but... young one is OK... maybe 5 to 16 years, then people up to like 30 years... and above... most of them are affected with the... coughing.” (KI)</div> <div>Middle-aged people and old-age people</div> <div>“middle-aged people and old-age people... Not many young people.” (KI)</div>						
When	<div>All the time</div> <div>• “It’s not seasonal - any time” (♂ ≥40y FG) • “No, all year round. Cough is all year round.” (♀ KI)</div>						
Cause	<div>Smoking</div> <div>• (♂ ≥40y FG) • “think the cause is... smoking... So most people around this place most of them are smokers” (KI)</div>	<div>Chewing Betel nut</div> <div>(♂ ≥40y FG)</div>	<div>Meat, fish, cooking</div> <div>• “Eating bloody meat... Fish, like blood so, you don’t dry it” (♂ ≥40y FG) • “you cook with fish and it has the smell of fish and you don’t wash it properly and use it as a water container or water pot for drinking, this can cause “sotwin”. Fish... if you don’t dry it properly and you cook it and someone eats it, it can cause “sotwin” (♀ <40y FG) • “the women... cook, give to you and you eat it” (♂ <40y FG)</div>	<div>Sex with women</div> <div>• “a woman comes and... has sex with you, this will cause this “sotwin” to occur” (♂ ≥40y FG) • “the women [unclear] your leg... Go with them” (♂ <40y FG)</div>	<div>Others</div> <div>“I’m sitting down and they come round behind and use the same space where you were sitting” (KI)</div>	<div>Rubbish and dust</div> <div>“If the house is dirty and you sleep with rubbish, dust, then you will get” (♂ <40y FG)</div>	<div>The sun</div> <div>(♀ <40y FG)</div>
Signs and symptoms	<div>• Heavy breathing • fast breathing • difficulty during physical exercise • coughing • “sotwin” • weakness</div> <div>• “When you walk up and down the mountain, you might call the “stretcher man”” (♀ <40y FG) • “If a man is breathing very heavily then we would know, he has “sotwin”. Walking long distances... you will see... coughing a lot as well... when you go up a mountain you will need frequent rests” (♂ ≥40y FG) • “The man might be coughing a lot. He will sit down, walk around and just rest... close to [the village]. He will not be able to climb up mountains... it’s like, your breath will become locked and you will faint” (♂ <40y FG) • “They tend to cough publicly, like openly. When they walk around you will see them coughing.” (KI) • “everybody cough, but asthma is like times where you can cough cough cough, suddenly... it will come like very strong and you will like breathe very very fast...” (KI) • said had sotwin, described symptom as cough (55y PT, diagnosed on assessment with LRTI and COPD; Parent [P] of 1y, diagnosed on assessment with URTI) • has no strength (39y PT, diagnosed on assessment with LRTI) • Sotwin a lot (P of 11months, diagnosed on assessment with LRTI)</div>						
Treatment	<div>Medicine from the forest</div> <div>Banana drink</div> <div>Papaya leaf</div> <div>Vine sap</div> <div>• “banana... in a cup, strain it, give it to the child. You can heal it in the village (unlike malaria which is hard - for that you should go straight to the hospital). Papaya leaf” (♀ <40y FG) • “You get some sap from a vine, just sap from a vine, cut it [local name: “bamul”]” (♂ <40y FG) • “it doesn’t have this kind of strong medicine from the forest. We have tried many times when “sotwin” has occurred and you take these kinds of medicines and just drink them, it will only help you for a short time... a day and tomorrow or the day after “sotwin” will occur again, OK some “sotwin” doesn’t go on for very long, it can go away and stop, and some people if “sotwin” has already taken hold of them, they will try all kinds of medicine but it won’t be enough, the “sotwin” will continue all the way until you become old... and they die” (♂ ≥40y FG) • Bush rope (cut the rope and drink the white sap) (39y PT diagnosed on assessment with LRTI)</div> <div>Pharmacy drugs</div> <div>Septtrin</div> <div>Amox</div> <div>• “[Q: do people treat this illness?] “No. They just live with the kus, cough.” (KI) • Said had “Sotwin” but had had no treatment (P of 2y, diagnosed on assessment with URTI, LRTI; 48y PT (diagnosed on assessment with COPD; 50y PT; e06 46y PT).</div> <div>Drink cold water</div> <div>(♂ <40y FG)</div>						

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Table S5. Ethnoclassification taxonomy of Cancer (3rd in combined group rankings).

Quotes in roman are translated from Tok Pisin (dual transcripts retained), quotes in italics were spoken as written. Attributed texts without quotation marks are from patient histories summarised by PNG research technicians.

Names	<i>“Susu cancer”</i> Breast cancer (♂≥40y Focus group [FG])	<i>“cancer bodi insait”</i> Cancers inside body (♂≥40y FG)	<i>“Sik bilong ol mama”</i> Cervical cancer (♀<40y, ♀≥40y FGs)
Who	Allot of us / We don’t know “Now a lot of us living here have cancer... we don’t know ourselves... when we go to the hospital... in order to get medicine or something... the doctors... they will say “you have cancer”” (♂≥40y FG)		
When	“It arrived in 2014 in the communities around here” (♀<40y FG)		
Cause	“No sure” (♀<40y FG)	Meat and Fish “Eating meat or that kind of thing... you don’t dry the meat properly... sometimes this can cause some illness or cancer inside, it’s like, there’s water from fish and you take it and you boil it and you eat it” (♂≥40y FG)	Smoking “This cancer that tends to be with a cough... sometimes... smoke a lot then cancer will occur” (♂≥40y FG)
Signs and symptoms	“We don’t know ourselves... we find out from the doctor” “Now a lot of us living here have cancer... we don’t know ourselves, we don’t know if we have cancer like this but... when we go to the hospital in order to get medicine or something, when the doctors check us or when they check our blood... now they will say “you have cancer” ... so we find out from the doctor” (♂≥40y FG)	Cough “it tends to occur with a cough and illness inside it tends to occur again inside” (♂≥40y FG)	Patient is red “They will look like blood” (♀≥40y FG)
Treatment	“Only the hospital will treat” (♀<40y FG) Hospital treatment not always successful, particularly if patients flee treatment “OK cancer if it occurs, there is no way to stop this, sometimes we go to the doctor and the doctor is able to cure the cancer, it will finish... suppose we tell them about our illness and we go and stay in the hospital, it’s like the cancer can be stopped but if we are afraid of the injection or something and they get the needle out and we run away, sometimes the cancer will not stop and the cancer will still sit on the body and after you become an old man... you can die from this” (♂≥40y FG)		

Absent Aid Post for referrals, hospital attendance to delayed
“my mother and his wife. She – she got the cervical cancer, she got that sick maybe for two years... if Wanang have a small haus sik there then easy to get a report and then move to the general hospital in Madang and easy to get treatment. But because of no haus sik there, the mother... herself she think that she is OK but the sickness is inside the body..., so we all never know what is with her, so after, the sick is like to stage – stage 4, then we all surprised then we took it to the hospital, and go to the x-ray and they said “oh, cervical cancer and it’s like in 50-50” so we try two hospitals here in Madang, and it cannot work as they said no medicine, we move her to the highlands, to Kundiawa General Hospital, and we went there and she passed away. So, that’s happened to like my mother and his wife...” (Key Informant)

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Table S6. Ethnoclassification taxonomy of “Grile” (Tinea imbricata) (4th in combined group rankings).
 Quotes in roman are translated from Tok Pisin (dual transcripts retained), quotes in italics were spoken as written. Attributed texts without quotation marks are from patient histories summarised by PNG research technicians.

Names	“Grile” (Tok Pisin: ♂≥40y, ♀<40y, ♀≥40y, ♂<40y Focus Groups [FG])		“Kavnam” (Local language: ♂≥40y, ♂<40y FG)		“Pukpuk” “crocodile” (Tok Pisin: ♀<40y, ♂<40y FGs)			
Who	Everyone, particularly infants & children ● “Everyone, all ages” (♂≥40y FG) ● “tends to occur in children, also people like us, and maybe some older men... [and] women as well, little girls too. Most of the time tinea occurs in babies, in younger and older men just occasionally” (♂<40y FG) ● “older people... middle aged people and some children as well. Maybe from small to older people” (Key Informant [KI])		Children ● “Most of the children have this disease” (KI) ● “[Q] <i>You say most of the children here [have Grile], how many children do you have in the school? [A] I have 186.</i> ” (KI)		Young men “Grile common in young men” (Research Technician [RT])	Older women, people are hiding it “There’s a lot of tinea. I’ve got it myself and I forgot about it! Severe tinea. A lot of us sitting down here have it... some people are hiding it so you can’t see it” (♀≥40y FG)		
When	Anytime ● “ <i>It doesn’t have seasons.</i> ” (KI) ● “Year to year. Mainly in the rain” (♂<40y FG) ● “Anytime” (♂≥40y FG)							
Cause	Wet clothes ● “You bathe... and keep wet clothing on you will get tinea very fast” (♂≥40y FG) ● “if you go walking in the rainy season... get wet in the rain, and you don’t change your clothes, you keep it on, you sleep with the same things... these wet things will cause this tinea... you’re walking along a long road... your shirt will be sweaty... you sit down rest, that will cause this” (♂<40y FG) ● “when you walk in the rain and you don’t change your clothes” (KI)		Contaminated rivers ● “we bathe in the river, like bad swamp water, water that is not clean, not flowing... or another man is bathing upstream from you, in that way you can catch tinea.” (KI) ● “Say I have tinea and bathe upstream and a man without tinea is bathing downstream, then these little “crocodile skin particles” ... the water carries them and he can get them, you have different kinds of water, some won’t have tinea, some will.” (♂≥40y FG) ● “if a man with tinea washes something upstream from you and you wash something you will get it” (♂<40y FG) ● “ <i>they use river for washing... it’s caused by that and then the clothes they wear... During the sunny period... the fast-flowing rivers become small... algae grows... children like to jump into those rivers...those algae... give them bacteria, so they have Grile.</i> ” (KI)		Touch and sharing clothes [and differing body-type susceptibility] ● “friend of yours uses [wet] clothes, sleeps with everything on, sleeping in bed and if I sleep alongside him, I touch him while sleeping, still I will get tinea in this case, both of our bodies touch so it can move across, but if my body is not the right kind to get tinea from him, it will not want to... and if my body is the same type as his, I will catch Grile...” (♂≥40y FG) ● “If a man has this tinea and you use something of his, it will... spread to you. The same clothes, if they have tinea in them, you wear your clothes, you will get it.” (♂<40y FG) ● transmitted from person with Grile... transmitted from other boys (patient histories)			
Signs and symptoms	● “Skin like crocodile. You might get it on your arm or leg... A man with tinea will scratch, a woman also, the skin will be painful” (♂≥40y FG) ● “They will be scratching... it’s like all over the body, that’s what this tinea is” (♂<40y FG) ● Some people are hiding it so you can’t see it” (♀≥40y FG) ● “ <i>Itchy all the time and they tend to scratch it all the time. [Q]: So they’re itching, this could be other conditions so how do we know it’s Grile? [A]: Itchy and... it just go on their skin... by looking at them you can see that they have Grile.</i> ” (KI)							
Treatment	“we are not able to cure... we make forest medicine, we buy medicines [but]... it just comes back.” (♂<40y FG)							
	Traditional treatments Plant-based ointments from the forest Lime, Seeds of “Moder” pepper, “sigwal” and tree tree blood bud paste ● “take kambang [lime powder used when chewing betelnut], daka [pepper chewed when chewing betelnut], and the bud from this tree flower... try to mix them with kambang.” (KI) ● “There’s a tree with... green leaves and yellow flowers, it’s found in sandy areas around large bodies of water [local name: “sigwal”]... say you’re walking along the road you see it, it bears... yellow fruit... unripe ones will be green... you just take a strainer, it will get the seeds... and you can just close them within a leaf and... heat them in the fire and when they’ve been heated a bit, take them out and you rub them... One thing is papaya – grate it, the papaya fruit, when you’ve grated it a lot, this... black blood that they have, you will take this and you scratch your tinea and you rub it in... find the place where it is... the pain.” (♂<40y FG)		Placing skin inside banana tree “Medicine I use... removes tinea from people, take a knife and make a hole in a banana plant – any banana plant – when it’s opened, put the skin infected with tinea inside... now it ends their tinea is cured... there is no spoken words or anything... Nowadays all of us don’t use this method” (♂<40y FG)		Hospital/Pharmacy Grile cream [Tolnaftate] ● “In the town one gets medicine like ointment... liquid medicine, to just rub in, and this OK... Something like that... this medicine people tend to use Panadol type – tablet” (♂<40y FG) ● Grile cream; Grile tablet; most cases of past Grile cream treatment used; diagnosis was by self (patient histories)		Grile tablet [Terbinafine] ● “Occasionally. If a man has “double” tinea all over the body, all the medicine won’t be able to stop it... you just need to go to the hospital and you go to the chemist and buy medicine specifically for tinea and you drink it and this, will recover” (♂≥40y FG) ● “I encourage them “if your parents going to town, tell them to buy, go to chemist and buy their tablets and soap there” (KI) ● Grile tablet from pharmacy (patient histories)	Effectively, No treatment “There is no treatment. Looking at them I always encourage them ... “when you go into town go to chemist and buy some medicine”. But looking at their number most have Grile. Especially my school children.” (KI)