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Part 2: Responding to Insights into the Social Determinants Influencing Access to Malaria Services

People Driven Design in NTT, Papua and West Papua

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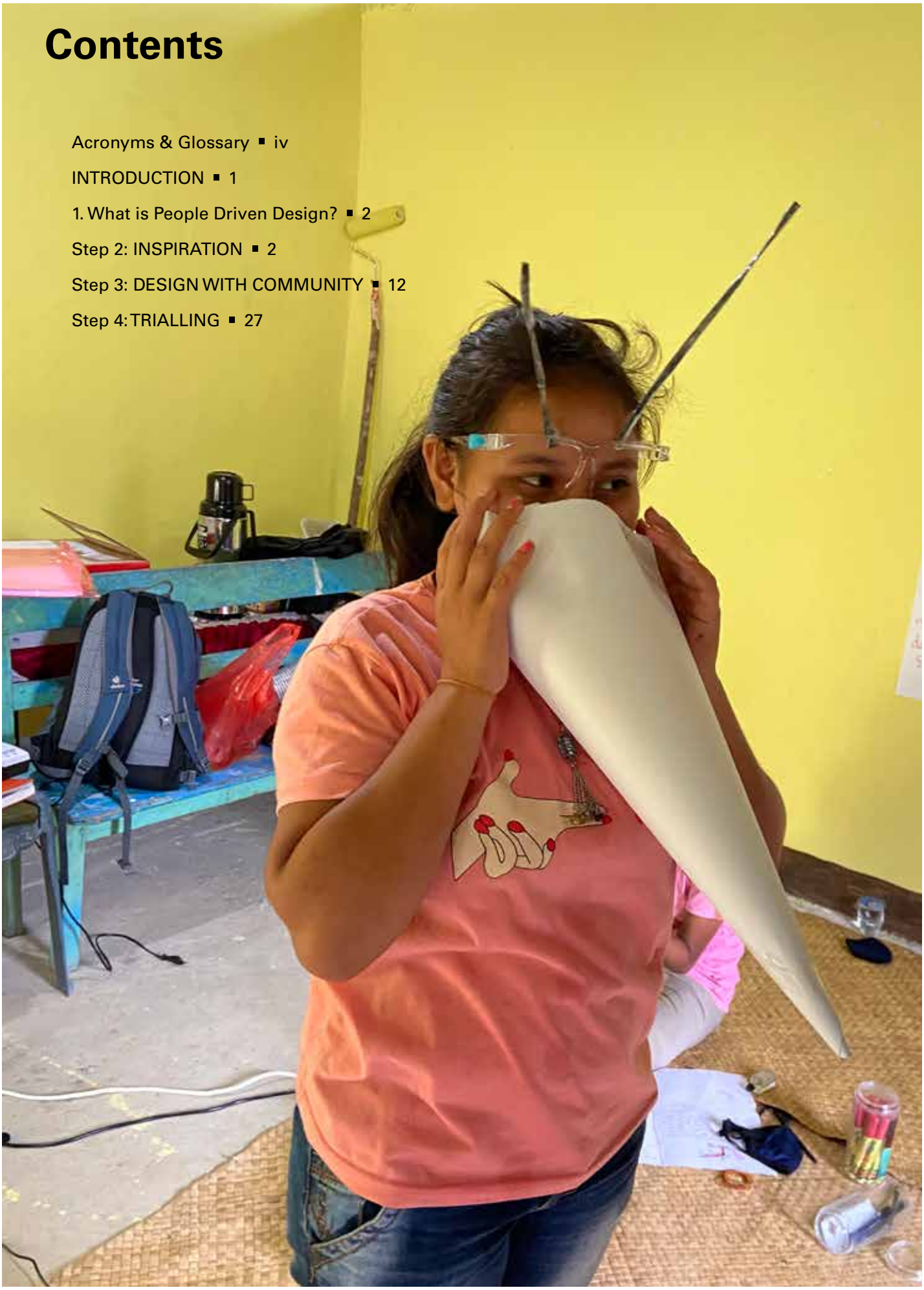
Contents



Acronyms and glossary

ANC	Ante Natal Clinic
COM-B	Capability, Opportunity and Motivation for Behaviour Change (framework introduced by Mitchie et al., 2011)
HCD	Human Centred Design
HSP	Health Service Provider
IPC	Inter-Personal Communication
NTT	Nusa Tenggara Timur, South East Timur
PDD	People-Driven Design
RDT	Rapid Diagnostic Test
RT	*Rukun Tetangga*, lowest administrative division in Indonesia - community association
SBC	Social and Behaviour Change

Sharing existing communications materials to gauge people's understanding and provide suggestions for improvement.

INTRODUCTION

Empatika has been commissioned by UNICEF to conduct formative research to understand the factors affecting access to malaria services in high endemic settings and to work with communities to identify communication approaches with the potential to accelerate positive behaviour change towards meeting the Government of Indonesia's intention to meet the UN Sustainable Development Goal of elimination of malaria by 2030. The formative research comprised essentially three phases; desk review, immersion research and design of communication products and processes for social and behaviour change (SBC). Findings from the immersion research and the efforts to design of locally embedded solutions are expected to feed into the National Malaria Control Programme's communication strategy design.

This report presents the third part of the formative research process and documents the people-driven design process (PDD) which followed the immersion which was undertaken in January 2021. It describes developing key areas on which SBC efforts were to be focused (and draws on recent evidence *that small do-able focused actions work optimally*), the participatory co-creation workshops facilitated at community level and preliminary insights from trialling community identifies communications solutions. The short duration of the contract has precluded opportunities for extensive trialling, iteration and reflection on outcomes.

The PDD process was facilitated in four of the original eight locations selected for the five day immersion research, one in each of the four districts; South West Sumba, NTT; Manokwari, West Papua; and Mimika and Jayapura, Papua.

Four steps of the PDD first developed by Empatika and Alive and Thrive (Alive and Thrive, 2020)[1] are shown below:

PEOPLE-DRIVEN DESIGN PROCESS

Our process entailed four steps, which include:

Step 1 | IMMERSION

Developing an in-depth understanding of daily life through immersion in a village.

Step 2 | INSPIRATION

Exploring what was learned in step one through a process of inspiration to identify focus behaviors and generate ideas and strategies to improve them.

Step 3 | DESIGN

Co-creating solutions in the village through a people-driven design process to address priority challenges identified during step two.

Step 4 | TRIALING

Testing potential solutions generated in step three through a trialing process in the village to assess their usefulness and feasibility to effect positive change.

[1] Empatika Team, 2020. 'Working Report, Phase Two: Exploring Maternal, Infant and Child Nutririon in Indonesia', Jakarta: Empatika & Alive and Thrive.

The process and findings of Step 1 (immersion) of the current study have been presented in a Part 1 'Social Determinants Influencing Access to Malaria Services: A Formative Study in NTT, Papua and West Papua, 2021' report.[2] Although we have separated step 1 (immersion) from the subsequent steps (2-4), the principles of participation and people-driven design filter through the entire four step formative research, design and trialling phases. The Immersion report is provided as Part 1 and this second and complementary report is Part 2 and focuses on steps two to four.

Section 1 what is people driven design? of this report describes what is understood by people-driven design (PDD) and how it differs from human centred design on which it is based. **Section 2 Step 2 inspiration** describes the initial 'inspiration' phase which comprises three elements; i) deep engagement with the immersion findings to build empathy with the local context and local social norms and behaviours followed by ii) identification of key behaviours which might be amenable to change and which were judged to likely have an impact on malaria elimination. These were formulated as 'how might we…' challenge statements to inspire the next step iii) identification of a range of possible solutions through a brainstorming approach. **Section 3 Step 3 Design with communities** describes the community level workshops and other informal interactions where immersion findings were shared back with communities, 'how might we' statements were refined and presented as design challenges and the process of people devising their own solutions and testing approaches. **Section 4 describes the preliminary trialing** of the solutions developed by the communities and local health service providers. **Section 5 Conclusions and lessons learned** discusses the reflection on the people-driven design process and its potentials for scale-out. The final section 6 provides proposals for **next steps.**

[2] Ayuandini, S., Tobing, F., Jupp, D., et al., 2021. 'Social Determinants Influencing Access to Malaria Services: A Formative Study in NTT, Papua and West Papua', Jakarta: Empatika and UNICEF Indonesia.

1. WHAT IS PEOPLE-DRIVEN DESIGN?

People-driven design (PDD) is based on the principles of human-centred design but makes explicit that people themselves are engaged directly in identifying their own behaviour challenges, setting goals and developing their own ideas to encourage behaviour change. This is a significant departure from conventional human centred design (HCD). When applied to SBC, HCD aims to focus on those whose changed behaviour is desired to ensure that change is achievable. A human perspective and understanding of context is central to guiding problem solving in HCD. Despite this emphasis on building empathy with those whose changed behaviour is desired and the use of ideation and iteration to develop SBC approaches, HCD tends to place the emphasis on innovation on the outside expert (innovating **for** people rather than **with** people). PDD requires outsiders to facilitate the design process with those whose behaviour change is desired as well as their support network so that products and processes developed to support behaviour change are **locally relevant, relatable and owned.** The premise for PDD suggests that engaging people directly in the design of the behaviour change process enhances their motivation and confidence to change behaviour. Proposed change is consequently feasible, appropriate, meaningful and locally supported.

STEP 2: INSPIRATION

As described in the graphic above, Step 2 'inspiration' is a deliberate and deep engagement with the particular context and behavioural determinants of current behaviour in order to brainstorm solutions. It comprises three elements; i) deep engagement with the immersion findings to build empathy with the local context and local social norms and behaviours followed by ii) identification of key behaviours which might be amenable to change and which were judged to likely have an impact on malaria elimination and (iii) creative problem solving.

Following the adapted immersion[3] phase where Empatika researchers either lived in the study communities or spent most of several consecutive days and evenings in the communities, the insights from informal conversations, observations and direct experience were shared within each study team. These insights were also shared across teams and findings analysed using a grounded theory approach.

To initiate the design phase of the study, a different analytical lens was applied whereby researchers collectively identified key behaviours which might be amenable to change and which were judged to likely have an impact on malaria elimination. These behaviours had to be ones which people themselves could change (i.e. were not dependent on external conditions and service provision over which they have no control) and were referred to as 'do-able' and possible entry points for people to design solutions for.

Key behaviours identified from this review of the findings related to prevention and cure of malaria were:

1. Not completing malaria medication
2. Pregnant women fear any medicines in pregnancy and so do not take prescribed malaria medication
3. Men less likely to take preventative measures and seek medical treatment
4. Teen boys practice risky behaviours which put them at risk of getting malaria
5. Ineffective mosquito control at household and community levels
6. Inadequate targeting of specially 'at risk' groups/risky times for information and testing
7. Delays (or no) testing and seeking treatment

These were subsequently 'tidied up' so that just four design challenges could be identified, as follows:

- Not completing malaria medication
- Ineffective community-wide mosquito control
- Inadequate targeting of specially 'at risk' groups/risky times (pregnancy, men/boys, infants)
- Delay or no testing & seeking treatment.

These behaviours manifest themselves across the study locations and design challenges were anticipated to be applicable more generally.

The following summarise the behavioural findings **specifically related to these design challenges:**

NOT COMPLETING MALARIA MEDICATION

People…

- Feel better after taking the first tablets and don't feel the need for more
- Stop taking '*as soon as shivering stops'* (even some health service providers do this too)
- Keep unused tablets for '*next time'*
- Complain about side effects of the medication (dizziness, hearing loss, nausea)
- Dislike the taste (*bitter)*
- Forget to take
- Are more likely not to complete medication commercially bought (Suldox, Fansidar)
- Don't trust advice from many health service providers (especially young/inexperienced, non-local, government rather than private). Information provided as brisk instructions/ reprimanding which patients don't like
- Children/teenagers are totally reliant on mothers to give them the medication.

[3] As a result of COVID 19 restrictions, the usual practice of living with families in the community was not possible, but researchers opted instead to interact with the communities over fours days, arriving early in the morning and staying into the evening and where possible staying in the community but not with families.

Knowledge

- Some pharmacies telling patients to take medication *'until the symptoms stop'*
- Very few know that if medication is not completed, it can re-occur and potentially mosquitoes can transmit from them to others
- If one gets malaria again within the year, usually assumed to be a different kind of malaria. People say the medication doesn't work *'if I keep getting malaria many times'*
- Some confusion when given vitamins too- which is which?

INEFFECTIVE MOSQUITO CONTROL

The predominant finding from the immersion was that across study locations there is low motivation to tackle the problem of malaria since it is perceived as being easily treatable (so why bother with prevention?) and endemic. *'We have always lived with mosquitoes'. 'You are not yet a Papuan if you haven't got malaria'.*

In terms of knowledge, people

- Mostly know where mosquitoes breed (and what 'wigglers' look like) but the connection between mosquitoes and malaria varies from location to location with some places clear about it. In the urban areas (Timika City/ Manokwari Urban) many people don't think mosquitoes and malaria are connected ('*you can get bitten and not get malaria*')
- Nevertheless, '*dirty environment*' is connected with getting malaria

People take **individual/household preventative actions** but these are generally limited to:

- Bednets widely used but people don't like new government issue -stiff, holes too big, not able to stretch/tuck in properly
- Women and children, in particular, use bednets
- Bednets used because mosquitoes noisy/ irritating and less to prevent malaria
- Some attempts to grow mosquito repellent plants in their gardens
- It was also clear that in some places people had strong preferences for traditional houses which are not well-designed to prevent mosquitos. These included wooden, stilted houses constructed near to fields as well as temporary field huts used for short stays (harvesting, hunting etc). Apart from cultural preference, people said that the airflow (wind) in traditional wood houses keep mosquitoes away and the houses are better for sleeping. It is therefore unrealistic to expect people to construct their homes differently.

Collective action to control mosquito breeding sites or other preventative actions are extremely limited:

- In some study areas there is little community/ communal spirit and people are unwilling to work together to clean the environment. Also, (especially in Papua) people pointed to a decline in volunteerism (with expectation for payment for cleaning and cadre work)
- People often clean the front of their houses (for status reasons) but not the back. Lots of garbage and puddles prevalent
- Malaria prevention plans (puskesmas/village) are generic/'cut & paste', if they exist at all, and not context specific
- Various malaria control programmes were criticised as inadequate. Although the Freeport MalCon programme which operates in Papua was regarded as more thorough than the Government one, like Government programmes it too is reduced in scope now. Other prevention programmes were also short-lived (due, we heard, to resource constraints)
- Poor, non-trusted relationships between health service providers and community. (In Timika City people even refuse bednets)
- No village plans or resources from *dana desa* earmarked for malaria prevention. Yet Puskesmas complain that their funds reduced because of *dana desa* allocations
- No cross institution planning/co-ordination. No comprehensive local programme.

INADEQUATE TARGETING OF SPECIALLY AT RISK GROUPS / RISKY TIMES

There is a lack of shared understanding of those who are at special risk by service providers and wider community and constrained resources to undertake appropriate surveillance and develop programmes. Highlighting risk for particular populations would be expected to increase motivation to change behaviours of the wider population.

- Poor knowledge of which segments of the population are at risk –health service providers not clear about low immunity groups (new arrivals, pregnant women (especially first pregnancy), children under five, others with compromised immunity, those living out of high endemic areas for periods of time and returning)
- 'Poor immunity' linked to fatigue, stress, getting overheated, poor diet, getting wet in rain, playing too hard in heat (kids) by people, a view shared by many health service providers
- Poor local record keeping and surveillance. No specially targeted programmes
- Puskesmas accountability upwards (e.g accounting for use of tests/medication, distribution of bednets) not accountability to community
- Puskesmas funds for outreach/special programmes reduced (especially since introduction of *dana desa*)
- No special programmes related to seasonal risk e.g. Fruit-harvesting (durian, cashew, matao) –often high mosquito prevalence but whole family takes more risks because of cash benefits.

Pregnant women fear any medicines in pregnancy

- Medicines are '*too strong*'
- Social media scare-stories
- 'Word of mouth' scare stories
- Health providers not up to date with what is safe to prescribe for malaria in pregnancy (some say nothing is safe)
- New mothers fear of criticism from others
- Trust traditional herbs/hot baths rather than allopathic medicines (do not even take paracetamol)
- Confusion -which is worse getting malaria or taking the medication?
- No active malaria information programmes at posyandu ante-natal clinics (ANC)
- Some cadres say hard to run education sessions without incentives for the participants
- Lack of routine screening in ANC, because of lack of resources (also posyandu not convening each month because of COVID). Even where there is screening –pregnant women delay first ANC visits and screening conducted late in pregnancy
- Local health service providers are quick to refer any pregnant women with malaria symptoms to district hospitals rather than follow guidelines (this creates more fear for pregnant women).

Men less likely to take preventative measures and seek medical treatment

- Malaria not a big deal '*It's like my friend*'
- Feel they are tough (when ill '*wait until can't take it anymore')*
- Have survived many bouts of malaria using their own treatments (e.g. sweating it out, herbs, keeping active)
- Get less severe symptoms (immunity) so don't bother to get medication
- Health and family health knowledge and agency (including managing bednets etc) rests with wives.
- Livelihood activities may put them at higher risk e.g. hunting in forest.
- Less likely than others to bother with bednets (only time many actually use them is when they go to the forest to combat the nuisance of mosquitoes rather than concern about contracting malaria)

- Social/recreational activities outside at night, '*fall asleep anywhere*'
- Don't like to use topical skin repellents (sticky- also expensive)
- Even when mass testing done *'men lazy to go*'
- Men (especially Papuan) don't like to '*waste time'* at the puskesmas (health service providers say '*they are impatient'*)
- Less targeted for information –especially health information.

Teen boys risky behaviours

- Mothers monitor medication closely but **not prevention…**
- Spend time outside (chat, play on mobile phone, drinking) where high prevalence of mosquitoes (often in places they feel they have more privacy)
- Often outside late at night/early hours
- Often outside without shirt
- Fruit seasons (often high mosquito prevalence) attracts them to be out picking
- Don't like sharing a bednet
- Bednets '*too hot'* (and they have alternative to sleep outside unlike girls/women)
- Grade 4/5 very short module on malaria from text book, **if at all.** No other information resources in school
- 'Bragging rights' –boys compete with others about how well they cope (but get severe malaria symptoms more often than adult men)
- Don't take symptoms seriously- only share with parents when they can't bear it
- Help with livelihood activities involving staying in forest at night
- Some know quite a lot about mosquito breeding sites, involved in prevention activities at home (e.g. bonfire smoke).

Infants

- Known to be higher risk
- Difficult to keep children under two under bednets
- Bednets rarely used in daytime (an exception being especially designed umbrella-type infant nets seen in use in Jayapura)
- Much concern that the chemicals in bednets are harmful for infants
- Don't like using smoke or spray around small children
- Wait and see how fever develops in babies/children under two before taking to puskesmas/health service provider. In babies/children under two fever is normalised (perceived by caregivers as a sign of growing, teething, playing in hot sun etc) so **usual to delay treatment.**

DELAY IN TESTING

Knowledge and practice

- Norm to wait at least 3 days to see if fever subsides (many wait a week). In babies/toddlers fever normalised (sign of growing, teething etc) so usual to delay treatment
- Also delay because think there '*might not be enough malaria to detect'*
- Perception that RDTs not reliable so if that is all that is available don't get tested until, say, go into town
- Many (especially men) feel it is better to sweat it out
- Self-medicate (traditional herbs etc) and symptoms alleviated so don't bother to get tested
- If already taking paracetamol/herbs believe that the malaria diagnosis might not work. *'It is hidden'* so don't get tested or re-tested
- Don't trust tests because '*sure they have malaria'* even when tests indicate they don't.

Supply-side

- During the COVID pandemic, many health centres closed or providing reduced services, perceived risk (for health service providers and patients),
- People dislike the health service providers (poor patient relations)
- Laboratories not staffed/understaffed or low on materials (quarterly supplies run out)
- Seasonal resource shortages (testing and medication) at high demand times (e.g. *pancaroba*)
- Government laboratories less trusted than private… but cost to access (except the private clinic in Sumba Remote)
- Puskesmas opening times very short and health service providers refuse to see patients out of hours. Government laboratory hours even shorter than puskesmas opening times. Sometimes have to wait overnight at point of service
- Transport cost high (Sumba Peri Urban) so people choose to purchase medication from kiosks instead. If cadres not available, high transport cost to get tested (Jayapura Lake)
- Government laboratories stretch resources e.g. dilute reagents; technicians complain of looking down microscope for too long.
- The four selected key behaviours were shared with UNICEF during a presentation prior to the field stage of the PDD process and were agreed as ones warranting attention.

HOW MIGHT WE….. STATEMENTS

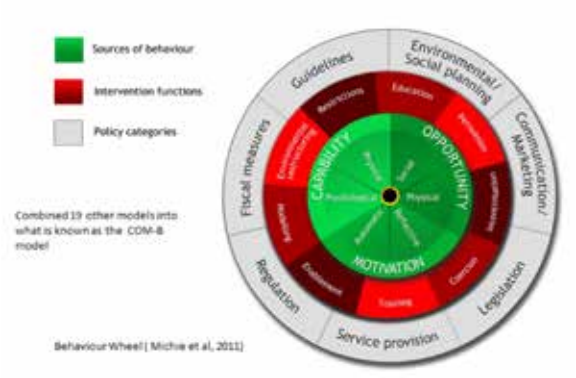
Using 'How might we…' statements is key in HCD approaches and is also used in PDD. These statements provide the **needed challenge to innovate.** The use of the word 'might' is intentional as it promotes creative thinking and ideation with the premise that even if it does not work out we will have learned something useful. The research team crafted the 'how might we' challenges during a workshop recognising that they must….

- focus on the **core issue** not symptoms
- be framed in ways to encourage **creativity and innovation** in finding solutions
- focus on people (what are humans doing to prevent desired change happening?) focus on the **needs and abilities of people** not on technological fixes
- enable the **'community' to provide the answers** (immersions and facilitated co-creation processes)
- focus on **ultimate impact -ie what will participants do differently** as a result of the SBC action.

The following 'how might we … 'statements were crafted;

1. **How might we…..** create a community-based system to support/motivate/ensure those diagnosed with malaria complete their prescribed medication?
2. **How might we…..** mobilise community to optimise mosquito control individually and collectively?
3. **How might we…..** develop a community-based process to identify and prioritise at risk groups?
4. **How might we……** create social responsibility/enthusiasm and conducive/responsive environment to normalise early testing?

In choosing locations for each design challenge we referred to the COM-B framework (Mitchie *et al.*, 2011). COM refers to the capabilities, motivation and opportunity for behaviour change which hinder and help behaviour change. The following justifications for choosing particular locations for each trial highlight the COM elements that the challenge is trying to address or which provides an opportunity for change.



1 How might we……. create a community- based system to support/motivate/ensure those diagnosed with malaria complete prescribed medication?

We chose Jayapura Lake because……

- Despite having dedicated and active malaria cadre, malaria prevalence remains a challenge (MOTIVATION)
- People don't know or understand why a complete course of medication must be taken (CAPABILITY)
- People are not concerned once symptoms go away and feel they can save unused tablets for another time (MOTIVATION)
- Strong culture of using local/traditional medication- relieve symptoms/not ridding the parasite (CAPABILITY)
- Supply-side not a problem -Government medication always available (OPPORTUNITY)
- Forest-based livelihoods are a risk (OPPORTUNITY)
- High cost if medical complications –transport/ referral out of village (MOTIVATION).

2 How might we……. mobilise community to optimize mosquito control individually and collectively?

We chose Timika Island because……

There is no collaborative action currently because;

- Distrust between puskesmas staff (majority are non-Papuan) and communities, (MOTIVATION)
- Distrust/jealousies between villages and village governments (formerly this was one large village but now divided into 7 villages) (MOTIVATION)
- De-motivated health service providers at the puskesmas –*'cant get these people to listen/change'* (malaria elimination considered impossible) (MOTIVATION)
- Non–Papuan health service providers remain in puskesmas compound 'bubble' rarely going out or meeting the community, many '*marking time until next posting'* (MOTIVATION)
- Despite resources (huge puskesmas staff >70 (many relatively idle), the puskesmas does have special malaria team; supportive Papuan head of puskesmas; large dana desa allocations (7 villages = total 600 HH only) but no malaria prevention activities and no inter-village collaboration. (OPPORTUNITY)
- It is characterized by being a flooded area with raised walkways, lots of trash, located near a swamp and therefore having many mosquito breeding sites (OPPORTUNITY).

3 How might we……develop a community-based process to identify and prioritise 'at risk' groups to reduce their risk?

We chose Sumba Peri Urban because……

- Official recorded malaria cases have declined considerably and people don't know why (no obvious change in behaviour, livelihood or environment) (CAPABILITY)
- High use of traditional remedies which reduce severity of symptoms (and possibly contribute to high levels of under-recorded cases of malaria?) (MOTIVATION)
- Teens (especially boys) say their most serious health issue is very severe headaches but only take paracetamol (also a possibility of under-recorded cases of malaria?). All said they had malaria when younger (CAPABILITY)
- Cultivating cash crops, collecting forest products and late night river fishing are high risk livelihood activities especially for men/ teens (OPPORTUNITY)

- Those who tested for/confirmed malaria are all women…. (possible under-reporting of men/ teen boys infection?) (OPPORTUNITY)
- In general, people don't use the puskesmas '*unless serious*' *(MOTIVATION)*
- Doctor at the puskesmas refuses to test for malaria unless they have all three symptoms present (headache, fever & shivers) (OPPORTUNITY)
- Resources at the puskesmas for malaria prevention have been reduced because few cases recorded (so puskesmas has no malaria cadre, no routine screening of pregnant women, no outreach programme) (OPPORTUNITY).

4 How might we…….create social responsibility/enthusiasm and conducive/ responsive environment to normalise early testing?

We chose Manokwari Urban because…… it is characterized by

- Mixed population (Papuan, Sulawesi & E Java) (OPPORTUNITY)
- Diverse livelihoods and education levels (civil servants, agriculture, transport, fishing, small entrepreneurs) (OPPORTUNITY)
- (surprisingly) very low knowledge of connection of malaria to mosquitoes, low understanding of value of early testing (CAPABILITY)
- High levels of self-diagnosis and purchase of over-the counter medications any time (MOTIVATION & OPPORTUNITY)
- Very many different places to get tested and get malaria medication (24/7) -not a supply–side problem (OPPORTUNITY HIGH and POSITIVE)
- Overstretched puskesmas resources as it has a huge urban catchment area (population >6000), no laboratory testing facilities, concentrates on bednet distribution and has no outreach programme.

Summary of design challenges

Location	How might we?	Main target groups
Jayapura Lake	How might we…. a community-based system to support/ motivate/ensure those diagnosed with malaria complete their prescribed medication (product & process)	cadre-led, neigh-bourhood groups
Timika Island	How might we…. mobilise community to optimise mosquito control individually and collectively (process)	A HSP/ cadre-led trial
Sumba Peri Urban	How might we….. develop a community-based process to identify and prioritise at risk groups (process)	Teens
Manokwari Urban	How might we……. create social responsibility/ enthusiasm and conducive/ responsive environment to normalise early testing (product)	Neigh-bourhood groups

Using these statements, researchers were challenged to come up with ideas which might help to address the desired behaviour change. Encouraged to think wildly, the team used 'post it' notes on Google Jamboard to generate lots of ideas for addressing each challenge. These ideas were purposively not critiqued and were able to provide the basis for generating further ideas.

It is important to recognize that during the inspiration process, the researchers and other expert advisors involved are not putting forward solutions to test but rather are identifying ideas which might inspire the community they will subsequently engage with during step 3: Design.

1) How might we…….create a community-based system to support/motivate/ensure those diagnosed with malaria complete prescribed medication

To address this behaviour challenge we included findings observed during the immersion.

Researchers had immersed in one community where a private foundation had recently opened a malaria clinic. Insights from interacting with people in this community suggested some good practice regarding completion of malaria medication as follows:

The private foundation clinic;

- requires people to come back for re-test after taking medication and this appears to work well (other health service providers in other locations may suggest this too but mostly people don't bother to return)
- takes time/one on one counselling with each patient, answering questions and explaining the medication. This level of IPC engagement appears to be appreciated and appears to work well.

Below is an example of brainstorming around the 'how might we….' **challenge #1 How might we…….create a community-based system to support/motivate/ensure those diagnosed with malaria complete prescribed medication.**

Example of brainstorming using post-its to creatively think about the how might we challenge.

Adult learning principles

- Adults need to **value the learning, how it applies to real life** and expect it to be useful. Intrinsic motivation
- Draw on **own experiences, contextualise**, need examples they can relate to
- Like to be problem-centred -**solving a problem**
- **Learn by doing themselves** & need to practice new skills
- Need to be **fully involved**
- Humiliation worse when an adult (no blame/ fear).

After as many ideas as possible were generated, researchers reviewed these and selected those which they thought might be do-able (ie did not require policy change, change in supply chains or directives for health providers or additional monetary resources which were outside the control of the community). Using the principles of adult learning (see Box above), each field team developed a plan for engaging the community in the next step of design of interventions to positively influence behaviour change.

Inspiration was also gained from international experience and innovations as well as successful PDD processes already facilitated by Empatika in nutrition. The research group asked *what lessons can we apply? what inspiration can we offer to the community design process?*

The following were some ideas which the team felt they might use for inspiration by challenge statement using participatory interactive visualized tools.

1 How might we…….create a community- based system to support/motivate/ensure those diagnosed with malaria complete prescribed medication.

- Work with cadre and neighbourhood groups
- Compare storylines of diseases with/without allopathic medicines and traditional treatments
- Use visuals & experiments (colour change experiments) to explain that taking less medicine does not eliminate/kill the disease. Only complete medication will kill /zap it
- Co-create a visual which can be used as a sleeve for the package of medication with simple and personalised instructions for taking the medication.
- Encourage cadres to continue to extend their home visits to encourage completion of medicines (friendly buddy system, providing reassurance around side effects etc.)

ANTICIPATED OUTPUT: simple medication (sleeve) packaging with customised simple instructions and home follow up.

2 How might we…….mobilise community to optimize mosquito control individually and collectively.

- Work with puskesmas health service providers to examine power relationships/barriers to relationship building & engagement with community & village governments
- Focus on two neighbouring (but most remote) villages –one dysfunctional and other slightly better
- Encourage health service providers to 'hang out' with communities informally, build relations- connect on human level
- Support health service providers to facilitate community-led mapping of breeding sites, high risk areas in both communities
- Support health service providers to facilitate local solution generation –what to do about the mapped risks? Ideation process and built–in community–led monitoring and evaluation
- Support community/health service providers/ village government dialogue on effective collaboration/resourcing (*mini musrenbang*) of community led malaria prevention programme.

ANTICIPATED OUTPUT: Guidelines on how to build collaborative and effective community–led mosquito prevention programme.

3 How might we……develop a community-based process to identify and prioritise 'at risk' groups to reduce their risk.

Work with teens

- Explore further the nature of severe headaches they complain of (relationship with other symptoms, activities, seasons, different types of headache) what patterns are there? What medications are taken and timelines of recovery
- Explore life stories of teens with them drawing their own 'river of life' –when they first got malaria, subsequent bouts, when they started to get different symptoms, what activities changed in their lives. Compare with their fathers/uncles life stories
- Build awareness through visual exercises of what happens when malaria untreated, consequences (including to others)
- Develop interest/enthusiasm for becoming 'teen ambassadors' to champion risk-reduction, early testing & treatment. Youth-led action plans.

ANTICIPATED OUTPUT: guidelines on engaging with teens to become ambassadors for elimination.

4 How might we…….create social responsibility/enthusiasm and conducive/ responsive environment to normalise early testing.

Work with Papuan and non-Papuan neighbourhood groups

- Compare symptoms, timeline /progression of diseases and fevers
- Discuss why people wait to get tested…. Experience with/without early test (storylines)
- Discuss time to be cured/feel less pain with early testing & medication
- Ideation around how to get the idea to test early (within 24hours) rather than wait and see- how will they get that message out to ALL and get the behaviour normalised.

ANTICIPATED OUTPUT: community-identified messaging (content & delivery).

STEP 3: DESIGN WITH COMMUNITIES

Four teams of two facilitators who had previously undertaken the immersion research, returned to the four selected communities in March 2021 for five days to facilitate design workshops with community members and local health service providers. The following documents the process in each community.

Challenge #1

How might we…….create a community-based system to support/motivate/ensure those diagnosed with malaria complete prescribed medication.

i. Re-connecting with the puskesmas

Following step 1 (immersion) the team had shared the findings with puskesmas staff by phone. This was followed by a visit prior to return to the village for the design workshops. The staff re-affirmed that these cadre, like others in their operating area, had been experiencing problems with non-compliance with malaria medication. They welcomed the initiative to collaborate with the cadres to try to design a local solution.

ii. Reconnecting with the cadres

There are three designated malaria cadres in this village (all relatives and including a man and wife). We contacted them by phone to explain that we would be coming back to facilitate a solutions generation process with them over a period of five days. On arrival, we shared again

the insights from the immersion and discussed how we might involve the community in the design process. It was suggested by a cadre that we involve six families to get a whole-family and cross generational perspective. The intention was to establish the cadres as leading this process. The 'how might we' challenge statement was simplified to reflect the cadre-led nature of this design to **How might we support/ motivate people to complete medication?**

A series of workshops were planned for the following day; (i) with mothers (and one grandmother), (ii) with teens and (iii) with fathers (and one grandfather) at times which were convenient for the different groups and using the empty (abandoned) pustu as a venue. The purpose of these sessions was to extend the understanding gained through the immersion on how people assessed the seriousness of malaria, what they knew about the progression of the disease and how they responded to symptoms.

This series of photos show the participatory nature of the three consecutive workshops facilitated with (i) mothers (7), (ii) fathers (8) and (iii) teens (6).

The process involved identifying

1. Causes of malaria
2. Symptoms of malaria
3. Usual course of the disease and response
4. Who is susceptible
5. Which service providers they prefer
6. Information and advice they receive.

The workshop discussions revealed;

- March (the month we were there) is regarded as the worst month for malaria
- The first response to identifying the cause is not mosquitoes but rather fatigue or weakness
- No one knew that malaria '*can stay in the body without them knowing*' (asymptomatic). Even the cadres felt they had not emphasised this
- None of the workshop participants knew that they could pass on malaria and this realisation concerned them recognising the risk to their children
- All note that fathers more likely to get malaria because of their exposure to mosquitoes while working in the forest, but had not previously recognised that they could pass it on to others (ie those not going to the forest themselves). This was a key 'light bulb' moment
- Despite being told to complete medication, none knew why this was important and all stopped taking when they felt better. (medication viewed as palliative not curative).

This diagram explains the typical pattern of taking medication during recent episodes of malaria (each row represents an individual). The green dots indicate the medication taken on Day 3 and it is clear that people do not take the required medication on day 3 (as the symptoms have eased). Most indicated that on day 3 they resume normal activities such as farm work, chores, return to school and experience no symptoms leading to the assumption that they are now OK.

When people feel better, they don't bother to come for re-testing.

Community workshops

To avoid social desirability bias, these three workshops were conducted without the malaria cadres so that authentic accounts of the course of malaria bouts and action taken could be recorded.

Cadre workshops

To ensure a shared level of understanding of malaria, causes, symptoms and treatment, we worked through similar participatory exercises with the cadre as we had facilitated with the community the previous day. The purpose was to compare their understanding with that of the community and jointly identify the gaps. They were surprised to learn that;

- People thought dirty water, coconut water, tiredness cause malaria and reflected that even simple things like this people don't understand.
- That people had not followed medication instructions cadres had given. They said, '*people don't listen*' but also reflected that they only tell people to come for re-testing without explaining why this is needed.
- Despite clear instructions (which people could repeat to us in the workshops) on a. need the complete medication; b. how and when to take ; c. additional advice on being extra cautious in protecting others when one member of the family has malaria (using bednets etc.) and d. need for re-testing on day 7, 14 and 21 that people never actually came back for these re-tests.

This led to the cadres recognition that telling/ instructing people was not actually working and they would need to find alternative ways to get people's attention.

Talking about ways to explain to people the need to actually kill the plasmodia, the cadres and researchers used the colour experiment of oxidising ascorbic acid (vitamin c) with iodine solution and decided that it demonstrates well the concept that you have to keep adding 'medication' until the plasmodium is gone (colour changes). This was felt to be a suitable demonstration for people to easily understand and would potentially enhance the explanation of the need to complete medication.

The cadres discussed how malaria medication needs to be tailored to the patient and identified 17 different profiles. The challenge they recognised was the need to personalise the medication and provide personalised information.

The cadres identified the key messages they felt needed to be conveyed based on the insights from the immersion and the community workshops; (i) clear transmission information (ii) malaria is still there even when feel better and (iii) correct dosage of medication.

This led to the cadres designing information that could be easily interpreted and attached to the medication. They experimented with different graphics and came up with one which mirrored the colour experiment, showing how the plasmodia gradually disappear from the body over the 3 days of medication.

Further iteration suggested that this could be made into a pocket for the medicines. This paper pocket could be personalised for each patient with their name, weight and the clear graphics based instructions for taking the medication. The pocket idea served another important function in that it safely contains the medication which sometimes requires cutting up blister packages in order to dispense the exact right dose.

The final prototype is being demonstrated by the cadre-designer here. On the final day working with them, the flow of the interpersonal communication process devised by the cadres (2nd photo) was tested out with actual patients.

Patients were able to repeat back what was explained on the packaging and felt it was clear and do-able.

This is a simple print-out (one A4 sheet has three pockets), this is cut, folded and stuck done at the sides. It then provides a pocket for the exact dose of medicines.

Translation: ……(name)…. (kg) *you have to finish the medicine in three days to kill all the malaria in your body*

The packaging provides space for the patient's name (informal) and their weight. This makes it both personal and reminds users that the dosage is customised for them.

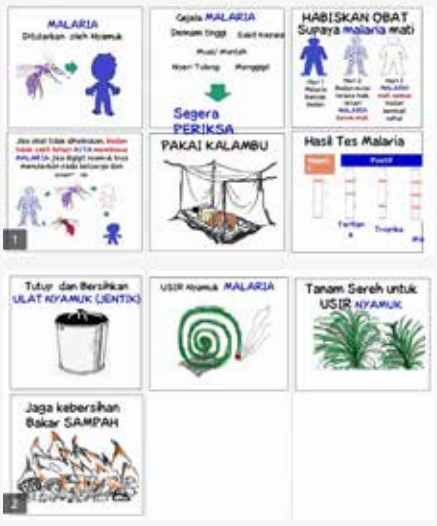
The pictures vary; adults, children, pregnant mothers or teens – giving the patient reassurance that the dosage is right for them.

It shows how many tablets need to be taken each day and the time it needs to be taken having been discussed with the patient which time they prefer. (The dosage is specifically for the particular patient –this example is for an adult*) and the progression of the destruction of the malaria parasite in the body (supported by the simple colour experiment also conducted during the discussion with the patient).

On the reverse side of the pocket, there is a simple diagram reminding the patient why they must get rid of the parasite completely by finishing all the treatment. The mosquito carries the parasite to another (blue dots inside).

Translation: *If you dont finish your medicine you will feel well but if the mosquito bites you it will spread malaria to your family and other people.*

*we tried a version with empty circles which could be coloured in but the cadres were concerned that they might make a mistake so preferred to have 17 different versions.



The show-cards were designed by the cadres themselves as they wanted them to give them more confidence in explaining malaria and ways to prevent it. Together with the colour experiment tests, these are designed for use in socialisation or group IPC rather than with patients sick with malaria.

Challenge # 2

How might we…….mobilise community to optimize mosquito control individually and collectively

i. Re-connecting with the health service providers

The team phoned and met the head of the puskesmas and the malaria team in town before returning to the village and discussed the proposed plan to try to facilitate the building of relationships between the village governments, the puskesmas and the community to plan and undertake mosquito control measures together. These interactions served to build support and the to acknowledge the head of puskesmas tacit approval to involve puskesmas staff in this endeavour.

Eight puskesmas staff (three men and five women with a mixture of local staff and posted staff) were involved in the five-day design process. The original plan to assist them to facilitate community workshops had to be abandoned when the community who were initially enthusiastic to participate pushed back on their commitment to join the process demanding substantial *uang duduk* (sitting money) for their attendance at workshops. Instead, informal engagement was through opportunistic conversations for example with road work groups. We continued to work with two older men (from the same village) who were willing to participate in more structured sessions over the ensuing five days.

ii. Community relationship building workshops with puskesmas staff

The immersion had indicated that the puskesmas staff were somewhat aloof from the seven villages that they served and that there was not a collaborative environment for any health related programmes. Community engagement is essential to improving services, outreach and outcomes. A series of workshops were facilitated to help the puskesmas staff recognise what they could do to improve this situation by building relations and planning programmes together. The following sessions were facilitated;

Sharing and discussing the immersion findings	• The findings resonate with the HSP experiences, especially about pill seeking behaviour. They confirmed that here the community is always '*asking for blue pills for malaria*' • The staff were surprised that mosquitos are the least mentioned cause of malaria that people noted • Without this connection being made, the control programme may not be understood but nevertheless acknowledged the need to focus on prevention rather than the heavy reliance on curative (pill-taking) behaviour.
Reflection on the appropriateness of the current malaria programmes in the community	• The current malaria programme basically has not changed year to year, is not evaluated or contextualised. Comprises bednet and abate distribution, larval control and posyandu based socialisation • Puskesmas staff find the villagers uncooperative (need incentives), suspicious and not trusting and inter-village jealousy rife (especially around resources). But also recognised that they default to blaming the community rather than identifying what they could do differently • Staff identified collaboration as key to making behaviour change happen and simplified the how might we challenge to 'how might we collaborate with people in malaria/mosquito control in the community.

Challenging assumptions and power distance	The participant health service providers (HSP) were shown a series of photographs of people in order to share their assumptions based on what they saw. Their interpretations were compared with the reality which ignited discussion on how we make assumptions and the prevalence of unconscious bias. They also talked about the assumptions they had when first joining this posting at the puskesmas and started to appreciate their own biases. Another role playing exercise challenged the HSP to reflect on their behaviour and position in terms of power over people. Aggressive actions were acknowledged on all sides and techniques with dealing with these were shared as were concepts of control and respect.
Conversations and listening	Further participatory exercises were facilitated to help the HSP think about how they normally communicate with patients (instructions, reprimanding, one-way rather than conversations, dialogue and listening) The session concluded with recognising that a different style of interaction is more supportive but also recognition that none of the HSP had ever had any training or support to develop these skills 'we do need to build rapport with people -wanted to do so but did not know how'.
walk-about to challenging assumptions   	The HSP were asked to informally walk about the community, observe and engage with people and practice the listening techniques discussed earlier in the workshop. Before doing this they identified some assumptions they held about the community but which they would actively try to suppress during the walkabout (these included that residents don't use clean water, practice open defecation, have little concern about the environment and have unhygienic practices (e.g. bringing dirty agricultural tools inside the house)). On returning from the walkabout, the HSP compared their assumptions with what they actually observed/experienced and the discussions they had had with community members regarding solutions. They noted that; • Cleaning efforts were often compensated individually rather than collectively so incentivisation was not appropriate. Furthermore in kind incentives often sold to the kiosk for cash • Cadres were criticised for 'chasing after money' rather than service to the community • Most solutions offered related to public service interventions e.g. providing a trash container but HSP did not think this would affect behaviour change. They concluded this session with ranking solutions as follows; 1. Village and district leaders instruct people to clean, promote volunteerism 2. HSP and village leaders mingle with people (ie create better relations, lead by example) 3. Improved village spatial planning; building better drainage; getting support to fix facilities 4. HSP make house visits use IPC to build relations and explain malaria control

Inspiration	To start this session, the HSP re-visited their original malaria action plan and recognised themselves the need to focus specifically on mosquito control rather than the scatter-gun approach of their plan. The HSPs were shown photos of a range of mosquito control measures used in other places to stimulate innovation (middle picture on the wall opposite).
Storyboarding 	The HSP divided into small working groups to design interventions to address (i) malaria prevention, (ii) village planning, (iii) socialisation, (iv) community cleaning/trash problem and (iv) re-connecting village leaders to their communities (as all but one live outside the village and only visit occasionally). Each working group devised a storyboard to address the issue and shared with the plenary. • Re-kindling commitment to voluntary work needs leadership • Socialisation efforts need to be timely –ie seasonal/outbreaks and consistent with distribution e.g of bednets • Garbage/waste management needs to be considered during the village planning process (delayed but serendipitously this month!)
	The HSP took their ideas to the community to elicit their feedback on what was workable and finalised three key interventions: **Malaria prevention** – this thrust involves (i) distributing abate, bednets with villagers growing and sharing anti-mosquito herb plants at high prevalence time (need to create sense of urgency), (ii) encouragement of the elderly to promote prevention activities actively and engage in IPC. The two older villagers who participated in the structured sessions are key in this initiative. **Garbage management** – this initiative is acknowledged as likely to take time and resources and the real focus coming out of this PDD process is to (i) build pressure on the village leaders to take the issue seriously and include in village planning, (ii) extend the practice of Friday community cleaning (currently in two of the seven villages) to the other villages, (iii) explore the feasibility of plastic weaving (using waste bags etc to make mats for sale) **'Mingling'** (informal relationship building)is a pre-condition for success of the other initiatives. Based on recognition that PK and community need to be closer, the HSP will (i) actively make walkabouts on Sunday evenings (when people at home) -listening, chatting and encouraging people's feedback, (ii) might try to initiate an inter-village sport competition to foster collaborative relations, (iii) use posyandu sessions for more informal interaction before session -creating better opportunities for IPC.

Parallel interactions with community

Having established that organising community workshops was not acceptable for the participants without remuneration for participation, the facilitators engaged with two men in their 60s with structured discussions aided by visual techniques over several days and informal opportunistic interactions with groups (e.g. a wood working group (>8 men), a road repair group (>6men)). Through these interactions the researchers were able to share the immersion findings and the following was confirmed:

- There is indeed a gap between the community and posted puskesmas staff who are perceived as less trusted than those health providers born in the village, are regarded as less friendly, don't listen and don't interact informally in the communities. They were also blamed for providing inconsistent prescriptions and advice (interpreted as being supply-driven health advice rather than expedient advice)
- Volunteerism/community collaborative action has declined since cash has been available from external sources
- There is a problem of mosquitoes control and people point to poor trash management (throwing trash under houses which then gets flooded, drains to the sea and then comes back)
- Informal interactions when the HSP come to the community show signs of working well.

Challenge #3

How might we……develop a community-based process to identify and prioritise 'at risk' groups to reduce their risk?

his was conceived of as a youth-led challenge. The Empatika facilitators worked over five days with predominantly eleven teenagers (seven girls and four boys) to work through a means to appeal to youth (and others) in providing information which might explain how mosquitos transmit malaria and how even being asymptomatic can be a risk for others.

Re-connecting with teens

Although planned it was not possible to work through the local school (as it was unexpectedly closed) to identify and motivate teens to participate in the design workshops but this may have been an advantage as instead the facilitator team re-kindled their relationship with teens they had met during the adapted immersion where rapport and trust had already been established who in turn invited others. The initial group comprised 14 participants from three different schools aged 16-22 years old. They joined each day for five days for about 4 hours per day.

	Opening sessions concentrated on building a fun and participatory environment where the participants felt comfortable and at ease. In the photograph they are drawing their family trees as a means to get to know each other.
	**River of Life** – the participants were encouraged to draw their life journey to include significant moments including times when they or family members had been ill. This was intended to open up discussion of different kinds of illness, those that they considered serious or possibly fatal and compare these to the experience of getting malaria. Resonating with the immersion findings, although many mentioned their own or family members' experience of malaria, they did not think this was a serious disease. Cancers, acid reflux, vomiting blood were all regarded as serious and the teens shared personal stories often reliving strong emotions of loss and bereavement.

What health issues are common in your family and for you?	The following session was designed to understand and extend the insights gathered from the immersion regarding the sorts of health problems teens faced. They scored those they had experienced and those their families experienced. At the top of the list they themselves experienced were severe headaches and vomiting and malaria next. None of the boys said they had ever had malaria but nevertheless had high numbers in their family who had had malaria. The teens themselves expressed surprise that severe headaches were common among them.
Understanding malaria	The teens asked for more information about malaria as it had never been a topic covered in school. We shared the following video of three parts https://www.youtube.com/watch?v=reKILpbTHFs&t=14s and facilitated a question and answer session.
Inspiration: sharing photos of a youth-led PDD related to iron deficiency and behaviour change to enhance iron rich diets	The facilitators shared a series of photos showing the process by which teens in Indonesia had led a PDD process which culminated in developing a game which helps teens understand iron dietary needs and what local foods can provide iron. The intention was to build confidence that they could also create something meaningful and useful to help change behaviour.
What makes a good story?	This session was designed to encourage the teen participants to reflect on what is good communication- when do they pay attention, are engaged and connected? By sharing their hobbies, they thought about these elements and what contributes to making the presentation engaging. The session concluded with the suggestions that the communication to get things across should be; • Fun and entertaining • Provide opportunities for discussion, for people to ask questions • Perhaps involve games or sports • Take place in groups who were familiar with each other • Use movies.
Sharing back immersion findings	The Empatika facilitators shared those findings particularly related to teens and compared their experiences in the community with those of the teens. They reiterated that they did get bitten a lot by mosquitoes, especially he boys out fishing in the evenings but their low frequency of experiencing typical malaria symptoms (except the headaches). They discussed why reported malaria cases are reducing but malaria is not eliminated.
Pictionary game	To build confidence in drawing and interpreting drawings as well as to deepen the participants knowledge and vocabulary around malaria, a version of pictionary was played (using words such as 'bednet', 'plasmodium'. Headache' etc.)

Youth led research

The challenge in broaching the topic of malaria and getting the problem to be taken seriously continued to be that the teens (and the wider community) **do not see this as a problem.** In order to address this perception the Empatika facilitators discussed the idea of gathering local contextual evidence which might persuade them and others that there was actually a problem. They devised a simple survey to ask their friends with the intention they would analyse the data collected themselves. They developed their own 12 question survey and pre-tested it with each other.

They also reflected through role play on what made a good survey process and encouraged respondents to be relaxed, answer accurately and be engaged.

The teens themselves concluded that the best way to conduct a survey was to;

- make it a conversation
- relax
- genuinely engage and want to know
- encourage additional discussion about the topic
- provide clear introduction
- assure respondents that there were no consequences for their answers
- and they discussed ways to assess whether respondents were telling the truth and how to probe.

None had ever done anything like this before but they went out into the community to interview three friends each. They reported back that it was fun and easy because used our own language and it was just like a conversation. Started the tabulation themselves.

The teen participants were encouraged to look at patterns in their data. Although there were only 32 respondents the following was instructive;

- all but one had experienced severe headaches, with 10 saying this was very often
- only 1/3rd knew how malaria is transmitted
- >2/3rd had had malaria (with positive test)
- All said it was curable
- About half indicated that you can get it again
- Most associated malaria symptoms with shivering and high fever with only five noting headache
- Although most said that the mosquito bites were the cause, at least a third said that other causes were being tired or getting too hot and some indicates you could get it from drinking dirty water
- Just over half said they got tested for malaria with others indicating they got medicines over the counter at the pharmacy or kiosk without testing
- 2/3rd said that if one member of the family gets malaria, it might (somehow) affect others

	The survey showed the teens that there may be unreported malaria in their community and that there was little or no understanding that carrying the plasmodium may result in others getting sick –those others, they recalled from their river of life stories could be those in their family who were more vulnerable e.g. babies and pregnant women. This realisation provided their own 'ah ha' moment for the youth to recognise there was a need to educate and change behaviour.
Critical review of communication materials	The teens had by this point in the workshop recognised the under-recognised problem and had discussed between themselves what makes engaging communication. So they were provided with existing malaria communication material and asked to critique it. Their conclusions were that messages were often complicated, too detailed, not relevant to the local context or not possible to achieve (often requiring external resources)
First design efforts 	They decided what information they would like to include (i) History of Malaria (been around long time, some historical facts eg. First president got it) (ii) 'Fun' Facts about Malaria (from their survey) (iii) Malaria symptoms (iv) How to prevent Malaria and (v) How to treat Malaria. Although their preferred channels would have ben story telling or movies, the lack of electricity and equipment in this village precluded this, so they suggested that they would develop a short drama supplemented by cue cards which could trigger two-way discussion and could be used with individuals where the staging of a drama was inappropriate. They developed the storyboard for their drama.
	The drama is narrated while other members of the cast act it out. It involves a *female mosquito (see photo).* The full script is translated below. The audience enjoyed the drama and were able to participate in the question and answer session that followed.

Translation of the narrative which was written by the teens themselves for the drama

Scene 1: In a village in Southwest Sumba, there lived a mosquito named the Anopheles mosquito, she was called Ano the mosquito. Right now, Ano the mosquito is pregnant, so she is very thirsty, she wants to drink human blood.

At night she flew here and there in search of a human whose blood could drink. Ano the mosquito circling the village in search of blood.

Scene 2: Oh look …… .. She found a pregnant women and her baby sleeping in a mosquito net. Ano the mosquito is sooooo happy. Soon she can drink as much blood as she wants. Sluruuup.

Scene 3: Oh noooo, Ano the mosquito can't get close to pregnant women and her baby. She was circling around trying to find an opening to get into the mosquito net. But she couldn't get in. Ano the Mosquito was very upset that she couldn't get into the mosquito net.

Scene 4: Ano the mosquito then flies around and around looking for other people. She flew and flew on. Suddenly she saw there were two young people there playing on their cellphones in front of the house, Rita and Nimrod. Ano the mosquito is very happy. she can drink now. Ano the mosquito then bit Rita and drank her blood.

Oh no, Ano is still thirsty. Then Ano moved to Nimrod to drink until she was full. Not forgetting Ano put plasmodium through her saliva into Rita and Nimrod's bodies.

Scene 5: a week after being bitten by mosquitoes, Rita and Nimrod started to feel the symptoms of malaria. Fever, chills and headaches, and sweating. Oh, it hurts so much. Poor them.

Due to illness, Rita finally went to the Puskesmas. She met a doctor. The doctor then checked Rita's blood to determine whether there was malaria or not in Rita's blood.

Oh, it turns out from the results of the lab check, Rita did have malaria. The doctor gave medicine to Rita to take home with the message that it must be finished completely. Rita was asked to come again 3 days later to check whether malaria was still there or not.

After that Rita went back to the Puskesmas to have her blood checked again. The Doctor did not find any more malaria in Rita's body. Happily, Rita has recovered from Malaria.

Scene 6: Nimrod also had headaches, fever and chills. But Nimrod didn't want to go to the Puskesmas. Nimrod goes to buy medicine at the store. Three days later, Nimrod's malaria symptoms also disappeared.

Scene 7: It's time for Ano the Mosquito to lay eggs, she goes to the stagnant water and lays her eggs. Many new mosquitoes appeared.

Scene 8: The new mosquitoes are now very good at flying, they fly here and there. Oh, they are thirsty too. They approached Nimrod who was lying on the floor. Then they bit Nimrod.

Scene 9: The new mosquitoes are still thirsty. They fly here and there again looking for people to bite. Oh, look there is the pregnant women and her baby are sleeping. This time they did not sleep under mosquito nets. So the mosquitoes can bite freely.

Scene 10: Oh look, a week after being bitten, Nimrod, pregnant women, and the baby now all have symptoms of Malaria. They have fever, headaches, chills, and sweats. Oh, it really hurts.

Scene 11: Rita came and told them, because Southwest Sumba is an endemic area, so if we have a fever, we all must go to the Puskesmas to be checked for malaria so that we know whether we have malaria or not.If there is malaria, it can be treated immediately until it is cured.

Scene 12: Pregnant women, the baby and Nimrod immediately went to the Puskesmas. The doctor immediately checked their blood. Oh, it turns out they all have Malaria.The doctor immediately gave the medicine and said that THE MEDICINE MUST BE FINISHED AND COME BACK after the medicines runs out to ensure that malaria is not in their bodies.

Scene 13: Nimrod now knows that if he starts having fever, headache, and chills, he must immediately go to the puskesmas for a test.

Now my family is free from Malaria. Hopefully, my village will be free from Malaria soon. Byeee mosquitoes.

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