A Blueprint for Applying Behavioral Insights to Malaria Service Delivery

Methods and Frameworks for Improving Provider Behavior

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Advancing Malaria Service Delivery

Contents

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Introduction

Background

Prevention and control of malaria depends, in part, on key services such as proper identification of suspected malaria cases, parasite-based diagnosis and treatment, and intermittent preventive treatment in pregnancy (IPTp). Much of the time, however, these services are unsought, not provided at all, or are delivered in an incomplete or inconsistent manner. For example, provider distrust of sulfadoxine-pyrimethamine (SP) and malaria rapid diagnostic tests (RDTs) can lead to nonadherence to clinical guidelines, while failure to submit reports in a timely fashion contributes to stock-outs [1]. Moreover, perceptions of poor service quality, social barriers and misconceptions can cause clients to delay care or discontinue treatment.

The intersection of service delivery and social and behavior change

Social and behavior change (SBC) programs focus on behavior. They place the client and the provider at the center, recognizing that they are affected by their immediate surroundings, social norms, personal beliefs and attitudes, abilities, resource constraints, and interactions with others. SBC programs test and implement human-centered solutions. Interventions range from communication materials and activities, procedural changes, product innovations, and minor environmental modifications, with the goal of facilitating individual and collective change.

Service delivery programs provide access to commodities and equipment, implement quality assurance systems to monitor effectiveness, train and supervise providers, update guidelines, and strengthen data quality. They play an essential role in ensuring facility and provider readiness to provide services. However, even when commodities, equipment, systems and training are in place, these are not always enough to ensure the desired behaviors are practiced.

When service delivery and SBC programs combine efforts, they can improve health outcomes. Yet service delivery and SBC programs often operate in silos. One reason has been a lack of understanding of concrete ways in which SBC interventions can support and integrate with service delivery efforts. Two areas with potential integration are provider behavior change and service communication.

- Service communication refers to the social and behavior change communication approaches used before, during and after service delivery. The client experience begins in the community, as clients hear about the quality and availability of health services. It continues once clients start services, become exposed to the reception/intake process and interact with providers. After their initial visit, clients' perceptions of care are mediated by follow-up visits or by engagement with ancillary services such as mothers' groups as well as any counseling they may have received. Malaria service communication encompasses activities that motivate caregivers to seek treatment for children's fevers, the ways providers counsel pregnant women during ANC visits, methods to encourage clients to take all ACT doses after a clinic visit and after symptoms subside, and ways of strengthening facility-community linkages [3].

- Provider behavior change understands that many factors, such as access to resources, supervision, and skills influence the way providers deliver services. There is also growing recognition that there are other crucial, often overlooked factors, such as the workplace environment, norms and relationships, beliefs/attitudes, and values affect provider motivation. Provider behavior change efforts seek to address these factors, both old and new [2]. Once clients arrive at the service delivery point, provider behavior change efforts can ensure clients have a positive experience, one that will help them return for future services and maintain healthy malaria behaviors.

The two overlap in some respects: both seek to improve the client experience and quality of care and both can use communication methods to improve interpersonal communication and provider behavior. Service communication may include advocacy, allowing for communities and facilities to discuss and address bottlenecks. On the other hand, provider behavior change allows room for additional approaches to motivate providers to provide quality services. From an SBC perspective, providers are both a channel for communication targeted to clients (service communication) and a target group for behavioral interventions (provider behavior change).

This document seeks to bridge silos by outlining some steps for approaching provider behavior change. It is hoped that having a shared framework will facilitate mutual understanding, coordination, innovation, and synergy in malaria service delivery.

To keep this document in focus, it does not cover community-based health workers; for the same reason, it was drafted with facility-based public sector providers in mind, though much of the content may also apply to community and private sector providers. The intended primary audience are in-country implementing partners and National Malaria Control Programs, though donors and other groups may find this useful as well.

The blueprint

The proposed steps are arranged in chronological order:

- Step 1. Define the desired behavior.
- Step 2. Defining priority provider groups.
- Step 3. Identifying factors that affect behaviors.
- Step 4. Involving users (providers and clients) in program design.
- Step 5. Matching interventions to the factors uncovered.
- Step 6. Using a holistic approach to monitoring and evaluation.

Conveniently, this process can be translated into an outline of a strategy for provider behavior change. A malaria service ecosystem model (Step 3), which shows the different levels of factors and actors that influence provider behavior, provides a framework for understanding behavioral determinants, identifying key stakeholders and interventions and monitoring and evaluation.

Users of this document might find it useful for:

- Understanding how an SBC lens can benefit efforts to change provider behavior
- Identifying powerful but rarely discussed factors that affect provider behavior
- Browsing a menu of possible interventions to gather ideas for program design
- Learning about user-centered approaches to intervention design
- Developing indicators for monitoring and evaluation

The process is illustrated using case management for uncomplicated malaria, IPTp and reporting behaviors in malaria control settings. Elimination settings, severe malaria and case management in malaria in pregnancy are not discussed; while they will have different behavioral determinants, the general steps for using an SBC lens may apply to them as well.

Step 1. Define the desired behavior

Which behavior(s) are we trying to change?

Recognize the primacy and complexity of provider behaviors

Making strides in case management and malaria in pregnancy will require a strong focus on provider behavior. As key influencers in the client-provider interaction, providers serve as gatekeepers for the uptake of IPTp, malaria testing and adherence to test results. Providers' interpersonal skills and the quality of counseling may affect client comprehension of medication regimens, completion of referrals, and future care-seeking. As the ones responsible for filling in registers and for submitting stock and Health Management Information Systems (HMIS) forms, providers also control the timeliness, completeness and accuracy of service statistics. Improving providers' case management, malaria in pregnancy and reporting behaviors will be crucial for reducing morbidity and mortality, improving surveillance, and measuring gaps and progress in malaria service delivery.

However, provider behaviors are complex in and of themselves. Table 1 shows that some of the key malaria provider behaviors involve multiple sub-behaviors. Sometimes national and global guidelines are ambiguous (for example, they may say "test all suspected cases" without specifying what constitutes a suspected case). In some cases, guidelines from different units of the Ministry of Health may conflict (for example, reproductive health and malaria guidelines regarding IPTp administration). The process of developing and disseminating tools and guidelines should account for how those tools and guidelines might be translated in practice. In situations where guidelines already exist, programs rolling them out should clearly spell out expected sub-behaviors for providers and means of measuring them.

Table 1 Sub-behaviors related to case management for uncomplicated malaria, IPTp, and (within each) reporting

Provider adherence to case management guidelines for uncomplicated malaria [4]	Provider adherence to malaria in pregnancy guidelines (specifically IPTp 3+) [5]
1. Identify a suspected case of malaria (usually by asking patients about a history of fever and conducting a physical exam) 2. Test all cases of suspected malaria using RDTs or microscopy. 3. Provide ACTs only to test-positive cases. 4. Assess clients with negative results for other common causes of fever (multi-step). 5. Prescribe appropriate treatment to clients with negative results; do not give antimalarials. 6. Assess and treat for other co-morbidities/co-infections. 7. For clients with confirmed malaria, counsel the client about when and how to take ACTs, and to	1. Identify pregnant women who are eligible for IPTp - SP • Estimate gestational age (must be at least 13 - 16 weeks gestation to receive the first dose of IPTp) • Check if she is taking cotrimoxazole (if she is HIV+ and not on cotrimoxazole, provide it; if she is on cotrimoxazole, refrain from providing SP) • For subsequent doses, check when her last SP dose was given (should be at least 4 weeks before) 2. Counsel client on the reasons for SP use, and give the client the opportunity to ask questions.

complete all doses. Counsel client on signs of severe malaria and the circumstances under which they should return to facility. For clients with negative test results, counsel them on the results and treatment implications (whether antipyretic only, treatment of other disease needed, or no medicine needed). For all clients, provide counseling on malaria prevention measures, and provide clients with the opportunity to ask questions. 8. Completely and accurately fill out each step of service provision in register(s)/patient cards. 9. Correctly tally data for reports 10. Submit reports on time	3. Administer SP via directly observed therapy by the health provider 4. Counsel the woman on how to prevent malaria (use of ITN) and when to return for her ANC visit. Give the client an opportunity to ask questions. Discuss potential barriers that the client may face and work with the client to brainstorm solutions. 5. Completely and accurately fill out each step of service provision in register(s)/patient cards. 6. Correctly tally data for reports 7. Submit reports on time

Measure performance gaps

Breaking down “adherence to guidelines” into sub-behaviors can be useful for understanding specific performance gaps. Providers may be more likely to comply with some steps while missing others or perform some steps incorrectly. Mapping sub-behaviors and measuring them can be used to design future programs.

The data from Figure 1 was from a health facility assessment in a province in Mozambique [6]. The first significant breakdown in the behavioral cascade was in malaria testing (82%). The other two major weaknesses identified were inappropriate dosing (71%) and incorrect counseling (59%). On the other hand, use of appropriate antimalarials was reasonably high at 89%. Interventions therefore, might need to focus on offering/conducting RDT tests, correct antimalarial dosing and counseling.

Some of this data may be available through the HMIS and supportive supervision checklists, and health facility surveys. The first, however, may not be the best source of data for identifying clients with fevers; past studies have shown that

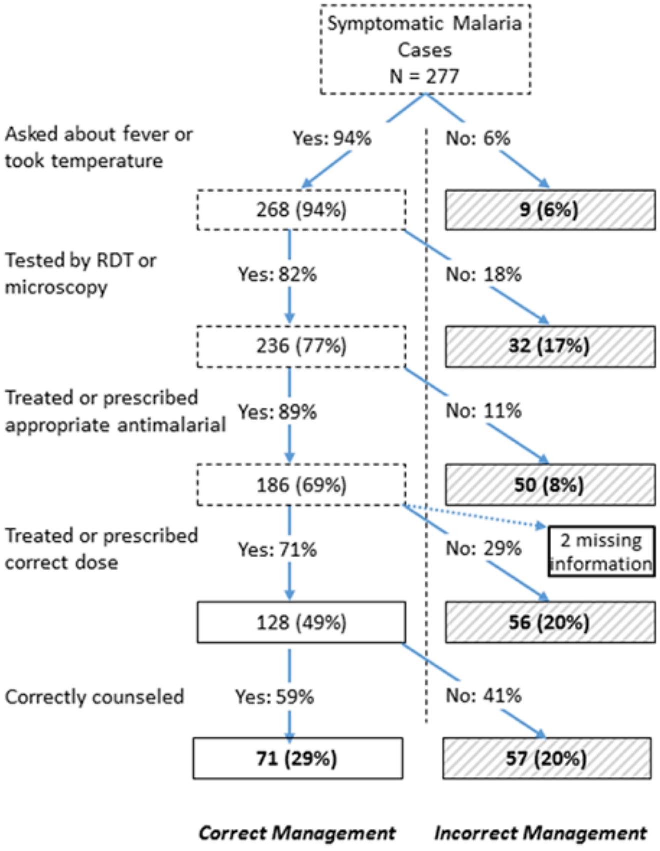

Figure 1 Malaria case management pathway for true malaria cases in a province in Mozambique, 2018. Percentages in boxes outlined in dashed lines represent cumulative proportion of patients managed correctly to that point. Boxes outlined in bold denote final categorization and percentages refer to final proportion of cases falling into each final categorization. Percentages reflect adjustment for cluster-sampling design.

providers do not routinely screen clients for fever, and have suggested adjustments to better gauge malaria testing practices with routine data.[7] [8].

Clarify if it is a behavioral or access issue

Access to key equipment or malaria commodities is likely to prevent adherence to guidelines, or at best, result in workarounds that make adherence hard to measure. Stock-outs of SP, for example, may result in public providers writing prescriptions for pregnant women to purchase SP at pharmacies and drug shops, reducing the likelihood of women taking IPTp, as women have to purchase it separately. Alternatively, providers may not offer any SP at all.

However, some issues that may normally be considered a structural issue, such as stock-outs, may have a behavioral root cause. Examples of these causes include late submission of supply chain reports, or the failure to issue commodities from the storeroom to the actual point of service (ex: lab or consultation room).

One way to identify if the root cause is access or behavior is to triangulate access/logistics data with performance data. If performance was close to or at desired levels during a period when the supplies were in stock, then it was likely to be an access issue, and it will be important to focus on addressing supply chain bottlenecks rather than to seek to change provider behaviors. If performance was low or medium even during times when commodities and supplies were in stock, then it is likely to be an behavioral issue and there may be a significant role for social and behavior change approaches.. For some key commodities (such as SP, RDTs and ACTs), existing data sources such as Logistics Management Information Systems (LMIS) and HMIS can be compared to see if it is a behavioral or access issue. However, lack of access to drinking water for DOT of IPTp, as well as some behavioral root causes of supply chain issues, may only likely be assessed through facility surveys or supervision visits.

Prioritize behaviors

While interventions can touch on multiple behaviors, they will be most effective when no more than 2-3 specific sub-behaviors are emphasized at any given time. Multiple behavioral objectives can make program design more complex, more time and resource intensive, and makes it harder for providers to retain content. Interventions can be staggered/phased to reduce these challenges. For this reason, it is helpful to use data to rank which behaviors should be prioritized (see step 6, monitoring and evaluation, for data sources). Criteria for prioritization should include behaviors with the most room for improvement, behaviors of greatest significance for health outcomes, or behaviors within the scope and expertise of the collaborating agencies involved.

Resources

- WHO guidelines for malaria case management
- WHO guidelines on Intermittent preventive treatment in pregnancy (IPTp)
- PSI Keystone Design Framework: Diagnose Phase Resources
- For Outreach, Training and Supportive Supervision Plus (OTSS+) checklists, contact Keith Esch at PMI Impact Malaria (kesch@psi.org)

Step 2. Define priority target groups and segment them

Who do we want to practice the desired behavior?

Targeting people as a general group is not the best way to achieve behavior change. Segmentation is an important part of designing behavior change interventions. It involves dividing target groups into smaller groups of people with similar needs, values and/or characteristics. Segmentation recognizes that different groups will respond differently to interventions [9]. Specific interventions and messages for specific groups will likely resonate more than generic ones and lead to more efficient use of resources. This section lists some ways to segment providers. In addition to the methods listed below, segmentation approaches can also be combined (ex: grouping providers of a certain cadre based on attitudes and biases).

Some conventional ways of segmenting providers have been by **cadre**, **function, years in service,** or **public versus private**. One example of segmentation by function is targeting providers who see pregnant women (such as ANC midwives) for malaria in pregnancy trainings. Segmentation by cadre involves grouping providers who have a similar level of medical training (such as nurses). In malaria case management, particularly adherence to RDT results, lower cadres (such as community health workers) are more likely to adhere to guidelines than higher ones (such as doctors) and they have demonstrated excellent adherence in managing fevers in both children and pregnant women [10]. On the other hand, providers with more years in service and higher educational training tend to rely more on their experience than on tests [11]. Generally speaking, public sector providers demonstrate higher adherence to guidelines, but private sector providers have a better reputation for customer service [12] [13].

Another way to segment providers has been by **location**, such as community versus facility-based providers, and further, by **facility type** (primary health facility versus referral hospital), which have very different environments and backgrounds; facility providers are paid employees at a public or private clinic and have received training within the formal medical or nursing curricula, while community-based providers receive minimal financial support (if any) and are trained outside the formal medical education system. They are often chosen by community members and, as such, have strong relationships with clients [2].

Segmentation by cadre, function, years in service, facility type, and public versus private can usually be done with administrative data and through consultation with district leadership or in the case of private sector, the local professional association.

When segmenting by cadre or function, it is important to understand the segment who should be *doing* the given behavior vs. those who have *decision-making power* over the given behavior as well as norms and power dynamics related to different cadres. For example, while nurses and midwives may primarily engage in the desired behaviors, the presence of a once-weekly visiting (or full-time) physician may affect their clinical autonomy within that facility. When this is the case, interventions targeted at nurses and midwives may not be successful if other influencers are not brought into the process.

One approach that has been used in the private sector for family planning has been to categorize providers as A, B, C, and D, based on **client volume** and the **provider's ability** to use the product. Categories range from A: providers that have the highest potential due to high volume and high ability, through B and C to D: providers that have low client volume and low ability [14]. This segmentation can be done through proficiency tests and service statistics. For example, providers who score poorly on IMCI skills tests who work in high-volume facilities may be at high risk for non-adherence to negative test results and may need to be prioritized.

Another approach involves classifying providers based on their **attitudes, beliefs and biases**; in family planning for youth, sample segments or provider "archetypes" have included "Average Passives" (aware of adolescent and youth sexual reproductive health practices, but somewhat biased and relatively unsympathetic for youth), the "Sympathetic Guardian" (relatively young, mostly nurses sympathetic to youth sexuality, and others. This method requires surveys and sophisticated statistical methods [15]. One less statistically intensive application is the medical detailing method, used by pharmaceutical sales representatives, where they tailor their messages to individual providers based on their assessment of the providers' stage of readiness, attitudes, beliefs or biases. However, this is an individual-level approach, not a group or population-level one.

Similar to providers, community members have been historically targeted based on **demographics** (caregivers, partners/spouses, mother-in-laws or grandmothers) or a combination of values, interests and attitudes (**psychographics**), or **life stages** (youth, newly married, expecting a baby, raising a family, etc.) [9].

One last key group to consider for malaria service delivery are **policy-makers/managers**. A WHO review of 70 countries found that district management teams were critical to successful implementation of the Integrated Management of Childhood Illness (IMCI) approach, and in some countries, district leadership attitudes had a stronger effect on the quality of implementation than socioeconomic development or donor support [16]. Compared to providers, district managers' priorities may be shaped to a larger degree by factors such as politics and organizational structures [17]. Malaria programs can incorporate an SBC lens into district management assessments to better understand district management attitudes, motivations and the local political, resource, and organizational landscape they inhabit.

Table 2. Ways to segment providers

SEGMENTATION APPROACHES	PROS	CONS
Cadre, function, years in service, public versus private, facility type or location (this is akin to the demographics or life stages approach used to segment community members)	Convenience (ability to use administrative data or consultation with local leadership).	Administrative data may not be complete or accurate. Assumes they all share the same beliefs, values and motivation to perform, which may not be the case. May not fully account for on-site power dynamics.
Volume & ability	Potential high impact on health outcomes due to the focus on high-volume facilities	Additional data needed to measure facility volume and assess provider skills. Assumes they all share the same beliefs, values and motivation to perform, which may not be the case.
Attitudes, beliefs and biases	Intervention is more likely to address behavioral root causes	Additional data needed to measure attitudes, beliefs and biases. More sophisticated analytical skills may also be needed if analyzing data from a group of providers. If the detailing method is used, it is important to hire personnel with strong interpersonal skills who can assess and tailor approaches to individual providers/clinics.

Resources

- How to do audience segmentation
- Provider Behavior Change Implementation Kit
- PSI Keystone Design Framework: Diagnose Phase Resources

Step 3. Diagnose the factors affecting behavior

What needs to be addressed to change the behavior?

A thorough diagnosis of the problem should begin with a list of potential contributors, using data to identify the ones at play in a given context, and agreement on which factors can be addressed by a social and behavior change approach. Behavioral theories are useful for providing a menu of potential factors to consider during formative research or during a situation analysis. Provider behavior change or service communication programs have used behavioral economics[1], the stages of change model[2], and the socioecological model (SEM), among others [14, 18-20] [3]. The Circle of Care model, which unpacks the three stages of service delivery (before services, during service, and after services), can also be used to identify communication needs at each stage [21]. This document uses the socioecological model because it provides the flexibility of considering malaria service delivery issues from the client perspective, the provider perspective, and the health system manager perspective. Just as the socio-ecological model shows the levels of influence in malaria service delivery, it can also illustrate the types of people who should be involved in the design.

Data sources for behavioral diagnoses can include a review of the gray and published literature, qualitative data collection (focus groups, key informant interviews, and observations), and quantitative data collection (such as knowledge, attitudes and practice questions included in health facility assessments and supportive supervision visits or as standalone provider surveys).

Each setting may have a different set of determinants and determinants present in multiple settings can be far more influential in some settings than others. This section explains the types of behavioral determinants involved at each level of the SEM. It is followed by examples of factors for a few specific malaria behaviors. This could serve as a menu of factors (or the start of one) that researchers should consider as they design formative research activities for malaria.

A malaria service ecosystem

The socioecological model below shows that behavior is influenced by many factors within and beyond the individual. They are interlinked and mutually reinforcing (as shown by the bi-directional arrows). The diagram was mainly drafted with public sector facility-based providers in mind, but many factors apply to private sector and community health workers as well (for a description of factors influencing community health worker performance in malaria programs see the systematic review conducted by Chipukuma et. al [22]).

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[1] Behavioral economics – identifies cognitive, social, situational, or economic factors

[2] Stages of change model - traces a person's progress from awareness to behavioral maintenance

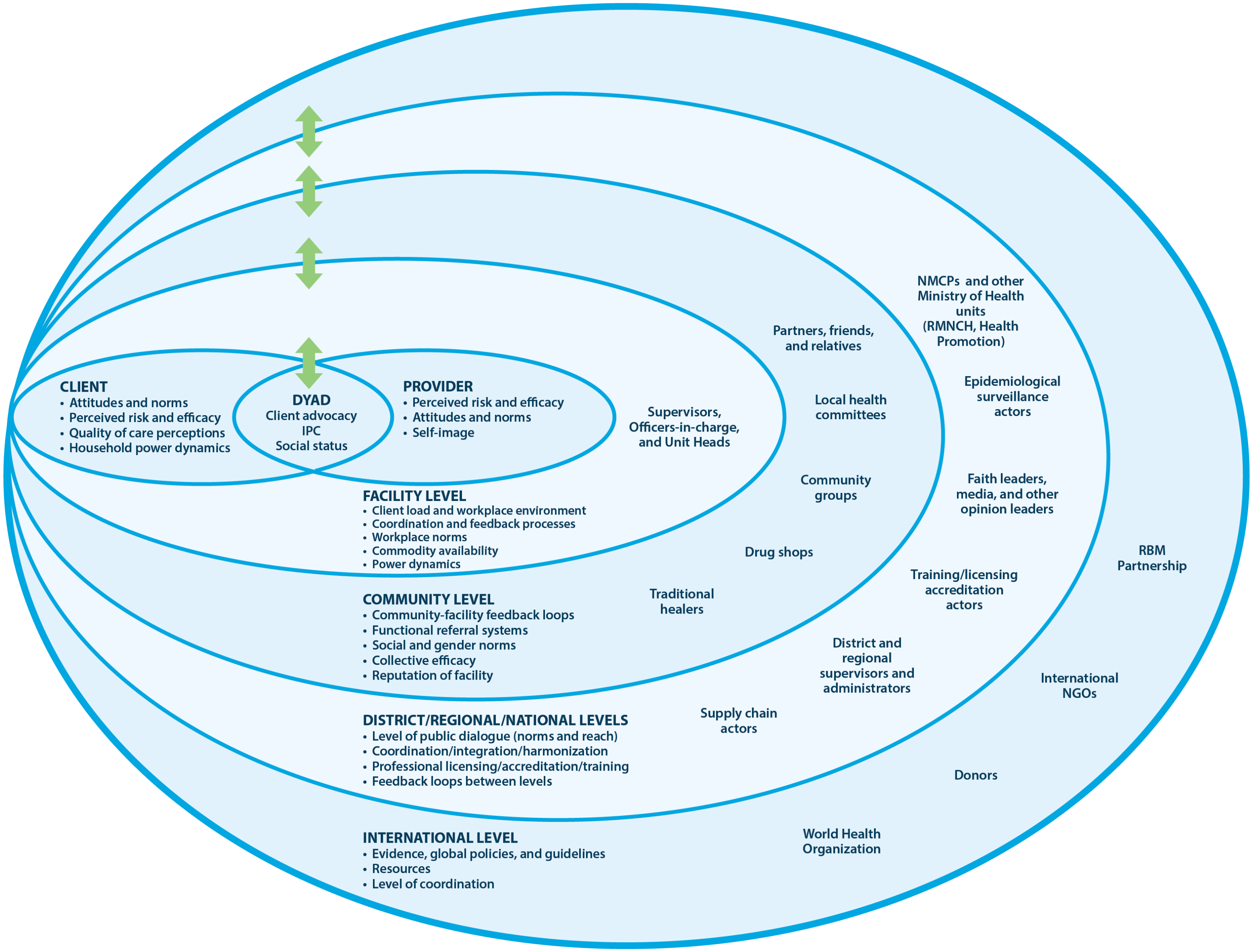

Figure 2. A malaria service ecosystem. The black text denotes influential actors at each level, while the blue text highlights determinants of provider behavior. Every level is interlinked and mutually reinforcing.

The model recognizes that **providers and clients are individuals** whose malaria-related practices are affected by their personal beliefs about risk (such as the client's perceived susceptibility to malaria and, for the provider, how serious the consequences could be or incorrectly managing a case (e.g., reputational risk, job security), the effectiveness of the behavior or intervention, their own confidence in their ability to practice it, power dynamics determining their ability to make decisions about their own health, or for the provider, the treatment plan, social norms, attitudes, perceptions and expectations about quality of care, and their assumptions toward certain provider or client characteristics (such as access to funds or transport). At the individual level, partners and family members are the main influencers (for providers as well as clients, as they must often balance their professional and domestic roles), with providers being additionally influenced by colleagues and supervisors.

The **dyadic nature of the provider-client interaction** is also reflected in the diagram, where it is mediated by the quality of the provider's interpersonal communication approach (IPC) and the client's ability to advocate for him or herself, their social status in relation to each other, and the power imbalances that result from all of these factors.

The **facility/service point level** reflects the influence of client load, workflow processes, workplace (peer/hierarchical) norms and environment, peer support, and feedback and performance improvement practices. High client volumes, complicated processes, the types of available diagnostic and treatment services, good/poor coordination between departments, facility type (ex: referral facilities that routinely handle life-threatening emergencies) and inadequate feedback from management may lead providers to take "shortcuts" during routine service provision. Similarly, these factors can deter clients from returning. At this level, officers-in-charge and unit heads are the key actors/influencers, though other factors like seniority, cadre, and personal connections can affect power/interpersonal dynamics. Facility readiness (the availability of essential commodities and trained providers) is also a factor at this level.

At the **community level**, the formal health sector competes with multiple options for health advice and services. Drug shops, traditional healers, spouses, relatives/in-laws, friends, social/community groups, and community and religious leaders can affect a client's decision to seek services, their attitudes toward formal sector services and providers, the source of service, the timing of service utilization, as well as the adoption or discontinuation of a behavior. Social and gender norms around care-seeking influence perceptions of people who may choose to seek care, or require complex processes for seeking permission or approval for care. The multiplicity of options can cause clients to present to formal health care services late or in advanced stages of disease or pregnancy, creating stress for providers. Public sector providers are sometimes transferred to new areas, where they face a learning curve in understanding the local culture and power dynamics in addition to building relationships with a new group of clients.

Finally, the **national/regional/district/organizational level** reflects broader social and organizational influences on service delivery and care-seeking. The level of public discussion among opinion leaders and the media can influence households and all players in the health system, while policies, professional associations and training and accreditation programs, and regulate professional norms and expectations [18]. The degree of harmonization across different health areas, use of data for decision-making, supply chain management procedures at regional or national level, and transmission setting (high/low), and the type of feedback or guidance given to lower levels influence service provision. Finally, health financing systems - such as cost-recovery models, performance-based financing, and health insurance - affect user fees, commodity availability, reporting requirements, and service utilization.

Although the socioecological model flags **clients** and **providers**, the presence of the national/regional/district/organization and facility levels shows that the behaviors of **policy makers and managers** matter as well.

Application to malaria behaviors

In the following tables, factors affecting provider adherence to negative test results, IPTp provision, and reporting are listed. These tables are meant to illustrate the use of the model, not to provide a comprehensive list – and can be used as a starting point when beginning to conduct formative assessments. For the sake of efficiency, systematic reviews were the main source of information.

It is not yet clear which of these factors appear to be most influential across settings since they may not have all been considered/assessed uniformly; for now, it is assumed that every setting will likely have its own set of priority factors that would be identified through formative and evaluation research.

Once the relevant factors are identified, they should be consistently revisited to ensure that the program is being developed, implemented, and evaluated in a way that systematically addresses them.

Factors influencing providers’ adherence to test results

Most studies in a recent systematic review reported that >90% of all RDT-positive clients receive antimalarial medicines [12]. The larger behavioral gap appears to be adherence to negative results – rates for adherence to negative results were lower overall, with a fitted temporal trend showing middling (but improving) rates of 50 to 80% over time [12]. For this reason, the table below focuses on the latter.

Photo credit: Mwangi Kirubi, PMI Impact Malaria

Provider-level factors	**Beliefs about current malaria prevalence** – Providers believe malaria prevalence should be higher than RDT test-positive rates [23]. **Self-image** – Clinicians feel that negative RDTs contradict their clinical expertise and rationalize this dissonance by finding fault/distrusting negative RDT results instead [23]. Community health workers (CHWs) and drug shops see the test as boosting their legitimacy [23]. (This can also be interpreted as "self-efficacy," or self-confidence.) **Alignment with values and priorities**- Carefully developed messages addressing existing provider principles and practices, as well as Ministry of Health branding (an institution known to influence the government health workers in this setting), appeared to motivate providers. For example, where facility-based providers felt RDTs created extra unpaid work, or where drug shop vendors felt it would hamper profit, motivation to use RDTs or even participate in a study with free commodities declined; the intervention did not position itself as benefiting providers in ways they valued [23]. **Diagnostic skills**– Providers (especially at peripheral facilities) generally know they should assess for other causes of fever, but do not know how to go about it effectively/efficiently. [24]
Client-level factors	**Children under 5 or severely ill clients**– Providers fear of missing malaria cases due to the possibility of serious consequences in these groups [25] [24].

Dyadic-level factors	**Feedback on client outcomes** – Observing that RDT negative clients recover without antimalarials was associated with a positive effect on behavior [23]. Similarly, noting that clients recover after taking ACTs despite being RDT-negative had a negative effect. A behavioral science lens suggests that the kinds of client outcomes providers hear about or observe affects the types of client recovery stories that providers keep top-of-mind [26]. The ability to monitor clients was considered an effective way to build trust in negative RDTs [23] . **Provider perceptions of client demand –** Providers reported that they have been pressured by clients to provide antimalarials in the past [24].
Facility/service delivery point-level factors	**Over-confidence in microscopy**– Providers distrusted negative RDT results when microscopy, "the gold standard," showed the client had malaria [24] [26]. **High workload, many clients -** Providers default to habit because they do not have the mental bandwidth or the time to consider alternative diagnoses [23]. **Task allocation and shift schedules** – Although RDTs can be done by any trained provider, RDT or microscopy results may not be available in a timely fashion in facilities where these are only done by laboratory staff and the laboratories are closed in the evenings and weekends, or when the staff is absent. **Diagnostic equipment** - lack of supplies and equipment for diagnosing non-malarial causes, in the case of people with negative test results.
Community level factors	*[see anecdotal factor below]
National, regional, district, or organizational level factors	**Clear, detailed, directive guidelines about management of negative diagnoses** – Clarifying providers' role and strengthening their skills in the management of alternative causes was associated with adherence. This was true even for CHWs and drug shops where providers' scope were limited to provision of just anti-pyretics or no medicines at all [23]. Adherence was also higher when there was no ambiguity or flexibility allowed for certain types of clients, such as those under 5 or who might have trouble returning [23] - the types of clients where providers worry about the illness progressing. **Feedback from authorities** - The highest adherence was observed among providers who had been closely supervised. In an evaluation of a text messaging program, providers considered text message reminders as a form of surveillance, and they adhered even when they felt the guidelines contradicted their clinical judgment [23]. **The diagnostic landscape** - Countries where testing was more familiar used mRDTs more appropriately [23]. There is also a lack of rapid, low-cost reliable tests for other, non-malaria causes of fever, making it difficult for providers to make alternate diagnoses.

**Providers may feel that not giving malaria drugs may result in loss of client/community trust in the facility, particularly if clients expect to receive such drugs regardless of test result (anecdotal)*

***In Senegal, rainfall, which may be a proxy for expected malaria prevalence, was associated with providers' use of RDTs. Rainfall/seasonality has not been measured in other studies on adherence to test results but beliefs around malaria prevalence has been identified in other countries [27].*

Box 1. Knowledge is not enough – the importance of norms and attitudes

Traditional approaches to provider behavior change tend to emphasize knowledge and skills-building activities such as trainings. While these are important, more and more studies increasingly implicate the presence of **provider norms, beliefs and attitudes** that inhibit adherence to malaria case management guidelines.

Davlantes et. al. found that supervision and training were not statistically associated with proper malaria case management in Guinea. Instead, the most strongly and consistently predictive factor was a provider norms index, which measured the perceived adherence to malaria case management guidelines among the providers' colleagues [8]. The influence of norms is plausible since providers typically look to medical colleagues for information about malaria [28] in the context of scarce access to other sources of information, and since norms have been implicated as behavioral determinants for provider behaviors in other health areas [29]. However, norms are typically unmeasured by assessments involving malaria providers, so it is not known how much of an issue this is in other countries. Ideally, norms would be consistently measured as potential determinants of behavior (see step 6, monitoring and evaluation).

Other researchers have found that beliefs/attitudes play a major part across multiple countries, as shown in the table above. They have since made the following recommendations:

"Interventions to improve the treatment of uncomplicated malaria should strive to change what providers <u>prefer</u>, rather than focus on what they <u>know</u>" [30]. (emphasis added)

"Respond to providers' <u>priorities</u> and <u>expectations</u>." [23] (emphasis added)

It is vital to see providers as people, not merely channels for delivering services. They are individuals and communities/groups who have beliefs, values, preferences, expectations and social norms that may affect their actions. By considering factors beyond knowledge, the universe of potentially effective interventions expand [31]. Many of these non-knowledge factors are explored in detail in this section and sample interventions can be found in Step 5.

Box 2. Characterizing the gap in client-provider communication

Counseling is a standard part of clinical practice but it is an understudied area. Studies from multiple Service Provision Assessments (SPA) and Service Availability and Readiness Assessments (SARA) have shown that provider counseling and communication can improve a client's intention to return [32]. There is some indication that malaria counseling can be far from optimal; a study in Mozambique found that only 58-62% of clients prescribed an antimalarial correctly recited dosing instructions, casting doubt on their ability to adhere to treatment regimens [6]. Similarly, a recent study in Uganda found a communication gap between CHWs and caregivers – caregivers did not understand that rectal artesunate was not a complete treatment for severe malaria so they did not understand the need to complete referrals [33].

Research and supervision activities can be designed to assess:

- **a.** How providers interpret clinical guidelines
- **b.** How providers perceive certain information should be communicated to clients
- **c.** Whether providers know what clients consider a quality interaction
- **d.** How, when and whether they counsel clients
- **e.** Clients' comprehension of the messaging
- **f.** How the counseling or the messaging affect clients' decision-making

Factors influencing IPTp provision

There is a large gap between ANC4 attendance and IPTp 3, as well significant drops in coverage of subsequent doses of IPTp3. In 2016, the WHO estimated that coverage of IPTp1, 2, and 3 were 56%, 43%, and 19%, respectively. Although ANC4 attendance can range from 30-90% across Sub-Saharan countries, IPTp 3 rates fall in the 5-30% range [57].

Photo credit: Mwangi Kirubi, PMI Impact Malaria

Compared to the number of beliefs/attitudes associated with adherence to malaria test results, provider-level factors for IPTp tend be characterized more by knowledge gaps. Client and community level factors include lack of awareness of the need to take (and consequently) request IPTp. Facility and national, regional, and district factors appear similar to RDTs (lack of essential commodities or lack of clear, locally adapted and prescriptive guidelines as well as weak quality improvement systems).

Provider factors	**Distrust of SP/Perceptions around lack of SP efficacy**- Providers do not understand why it is still being used for intermittent preventive treatment when it has been discontinued as a first line treatment [34] Confusion over the timing and dosage or irrational use of SP [20] Mistakes in calculating ongoing gestational age [20] **Misconception that SP should not be taken on an empty stomach**, resulting in providers giving it to women to take later. [20]

	Confusion about when to give IPTp in relation to treatment of malaria, HIV, or other illnesses [20] **Do not distinguish between mild and serious side effects** - Providers do not offer IPTp to women who report having 'reacted' to IPTp during previous pregnancies. However, from respondents' examples, it appeared they were referring to mild side effects rather than potentially life threatening allergic reactions. [35]
Client factors	**Late presentation at ANC** and/or **not returning for visits -** Clients may be occupied with farming, employment or childcare commitments; shyness/lack of privacy at ANC [20]. Missing ANC appointments may result in missing IPTp doses, **Inability to pay** for fees resulting in denial of services [20] **Confusion over what drugs are safe to take in pregnancy** - Women question the need to take medicine for a disease when one is not sick; fear side effects [20] **Demographics** - Advanced maternal age, higher educational attainment, higher parity, lower gestational age at booking were positively associated with IPTp uptake [20] Lack of knowledge about the benefits of IPTp [20]
Dyadic factors	**Poor counseling** - Provider often gave SP and iron tablets to women without any explanations or instructions, or instructions were not given in the local language [20]. Providers also gave unclear counseling about costs of services – for example, if SP was free but prescribed with other costly medications, clients did not know that SP was free and they were deterred by the prices. [36] ANC clients who attended facilities at which providers discussed the purpose and side-effects of anti-malarial prophylaxis, and the importance of IPTp doses and using ITNs were significantly more likely to have received at least one dose of IPTp [37].* Lack of respectful maternity care - insensitivity, rudeness, humiliation, neglect, abuse, and even physical violence by health center staff have been cited as key factors limiting women's use of ANC services [59].
Community-level factors	Women reported **needing their husbands' support or consent** before attending ANC or before taking any drugs [20] **Lack of widespread understanding/discussion of IPTp** – In Mali, clients generally reported "the three white pills" as available and tolerable, but frequently could not identify its name or purpose. In contrast, there is a local term for iron, women know it "increases the blood" and know it is given in red pills [36]. **Power dynamics** – In Mali, ANC care itself can be considered inappropriate or shameful, specifically if an older woman must agree to be examined by a younger female care provider [36] **Lack of privacy/social norms around ANC** – In Mali, shame associated with going to ANC was said to make a woman and the child vulnerable to curses from jealous neighbors, made worse because ANC is public and everyone will know (cited by husbands, not by women) [36] Cultural norms/social taboos about when to publicly recognize pregnancy – contributes to late presentation.
Facility-level factors	**Stock-outs of SP** resulting in providers requiring clients to purchase them elsewhere) [20]

	Insufficient water and cups leading to SP not being offered or women being asked to share cups or to purchase water, which they may refuse [20] **High client-to-staff ratios** reduce consultation times, resulting in no or poor DOT [6] Guidelines and job aids (such as for determining gestational age and IPTp timing) not available at health facilities [20] **Facility type** – private sector facilities less likely to adhere to IPTp guidelines [20]
National, regional, district-level factors	**Unclear and conflicting policy and guidance** on IPTp [20]. This can be tied to the degree of integration and harmonization between national reproductive health, malaria and HIV programs. Without either, MIP implementation can be disjointed, conflicting, marginalized and lack accountability [57, 58]. **Dosing policy** - Zambia and Ghana, whose initial policies recommended at least 3 doses of IPTp, have achieved some of the highest IPTp coverage rates in Sub-Saharan Africa, which may indicate a policy promoting frequent dosing creates an enabling environment for better coverage [57] Lack of effective training and supervision of healthcare providers and lack of quality assurance of IPTp delivery in facilities [20] **Poor management of an antimalarial policy transition** in one country led to negative media coverage about SP and loss in confidence in SP [20]

**In addition, providers may attribute clients' late presentation at ANC or reluctance to take IPTp to knowledge gaps, when there may be other interpersonal or social factors at play. Without strong counseling skills providers are unable to tease out these issues and help clients to address them. (Anecdotal)*

Factors influencing provider reporting

This list was gathered from papers covering several health areas, and usually for one country at a time (no review papers were found). The few examples of malaria are mentioned. Another useful framework is PRISM (Performance of Routine Information System Management).

Photo credit: Mwangi Kirubi, PMI Impact Malaria

Provider-level factors	**No immediate benefit for the provider**. Reporting, not use, is perceived to be the main purpose of data (see national level). From the health workers' perspective, reports and the data they contain are solely for use by others [38-40]. **Poor understanding of how to use data to make decisions**. Generally, providers are unable to articulate how to do so. For example, health workers mention they decide to carry out outreach activities but do not point at a clear set of data that would inform this decision (there was one example where a health worker said that an increase in malaria cases would lead her to plan a community meeting on net use). Sometimes health workers are instructed to take certain actions by higher levels without explanations linked to data. Decisions were mainly restricted to "community" actions (like above) and not in other managerial areas (when to request more medicines), or clinical care (such as identifying clients who need referral or follow-up) [44-46]. **Confusion about indicators** – providers had different interpretations of "clinical malaria," and "confirmed malaria"; compounded by similar-looking (but different) indicators in forms "IPTp2" in registers vs. "IPTp2+" in monthly summary forms. There is significant confusion over the denominator for IPTp uptake, resulting in lack of understanding of what the indicator means and how to calculate it. [41] [42]

	Overconfidence combined with poor numeracy skills – In South Africa, average levels of perceived confidence (69%) in data skills/tasks were not commensurate with the competence (30%) (based on a test). [43] In the same sample, **age, having manager-level work, and education level**– were positively associated with data competence [43]
Client-level factors	**Clients lack documentation** – clients lose client cards and prescriptions, making it harder for providers to maintain continuity of care [38]. **Clients leave the facility mid-service** – Clients often wait several times in the process of being registered, assessed and treated by providers. They may choose to leave the facility instead of waiting to get the next stage of service, leading to missing data fields (this is also affected by facilities' client flow processes) [44]. **Pregnant women go to different facilities during the same pregnancy** – they can be double counted as IPTp1 in different facilities, or if there are enough of them, IPTp2 rates can be higher than IPTp1. [35]
Dyadic-level factors	**Non-compliance with DOT -** women might not take SP if they bring it home, while health workers are likely to record that IPTp was done [35]
Facility/service delivery point-level factors	**Time to fill out forms takes away from client care and burdens providers** – Providers estimated they spent seven hours a month filling out forms (median). Each consultation involves several minutes of filling out forms. Some facilities reduce number of hours/rooms open to services so providers can fill out forms. Staff also stay after hours to complete tally sheets and dedicate entire days to completing all the required monthly reports [44-46]. **Lack of standardization in data quality practices** – Facility staff could not consistently describe standard procedures to deal with incompleteness, inaccuracy, missing or late reporting of data [44-46]. **Stock-outs of forms** – In the absence of forms, facilities photocopy or manually copy registers. These workarounds are time-consuming and can cause more confusion (for example, not all columns are copied from a register or the reporting focal person does not understand parts of the form, making it difficult for them to complete the monthly summary forms) [44-46]. **Data quality issues (and data use) related to surveillance are prioritized over data related to service provision** [39] [38] (also applies to higher levels - providers are more likely to get alerts and guidance about outbreaks from higher levels than on quality of service provision using HMIS data) **Training** - Providers may not have adequate training on the forms they have to fill out, including ancillary forms such as those for stock-keeping records and reports. Providers sometimes fill in for each other to provide services but the substitutes may not know how to fill in the forms/registers for the services that are not part of their usual day-to-day jobs[39]. **Poor organization** of paper forms and records [44-46]. **Volume of clients** – Systems break down in facilities that treat large populations. Staff in high-volume facilities spend more time completing forms/reports, and clients may be seen in multiple areas (instead of the area where the register might be) [44-46] [35] [42] **Lack of a culture of using information** (see above and below) **Data management responsibilities not clearly defined or assigned to staff** [44]
Community level factors	[No community-level factors found during the literature review]

National, regional, district-level factors	**Data validation exercises do not take place within the facility** - These are usually only done at the district level, and only intermittently. This may lead to providers' also not having a strong understanding of data quality measures. It also doubles workloads without benefiting providers. When registers are brought to the district level for validation, staff improvise registers using notebooks and will need to copy that information to the register later [44-46]. **Mismatch between level of responsibility and resources** - The district level is given most of the responsibilities for data entry, feedback, and data quality yet they often lack political will, resources, equipment and skilled staff [40]. **Leadership and management** - The PRISM toolkit for HIS strengthening examines several dimensions of district management and governance, including the decisions and actions taken based on performance monitoring meetings (e.g., discussing key performance targets); comparisons of district data over time and with national targets; annual planning, among others [60]. **Forms are not designed to fit the decisions that clinicians need to make**, such as assessment/treatment, counseling, and follow-up. For example, client histories are helpful for choosing treatment if an effective analysis can be arrived at, however, the register/treatment card is an open field offering no clinical guidance, and there may not be a place to record follow-ups. Without a space to record a negative result —a client not showing up— the paper-based system, which emphasizes only recording, does not offer an 'alert' to take action to track down the client. Forms are based on the needs of higher-level stakeholders, not clinicians [44-46]. **Lack of guidance or room for explanation when there is ambiguity**. For example, there may be no room to record 'suspected' malaria cases or 'clinical malaria' in registers; or a client may have multiple co-morbidities but the inpatient report only has room for a main diagnosis. When confronted with the real-world messiness of data, staff do not have the option to explain or to qualify their entries. Since completeness is more easily measured than correctness, providers may make up the data to avoid being punished [38]. Register instructions were unclear on how to record why a woman was not eligible for IPTp, so providers came up with various symbols. **[41]** **Lack of guidance around how providers can use their own data to inform their work** **Stock-outs of forms** – Higher levels do not/cannot resupply forms in a timely way, even when facilities inform them of the problem [44-46]. **Norms** - Tallying in the moment of care is more accurate but is formalized only for immunization [40]; use of tally sheets was associated with improved malaria data quality in the Solomon Islands [42]. In disease surveillance, there is an explicit practice of 'zero reporting (in contrast, in other areas, the difference between zero and blank is not clear) [38]. **Register designs create hassles** - Registers are too bulky to move around, but clients have to move through different departments. The chronological nature of the registers makes it hard to track clients, since the provider has to flip through several pages to find past visits [44-46]. **Vertical programs** contribute to duplication and fragmentation of feedback/quality assurance processes, creating more workload and affecting quality[39]. **Degree of harmonization** of data collection and reporting tools [44-46]. This can be tied to the **existence of coordination mechanisms and M&E frameworks** (usually at national level) [44-46].

	Quality of graphic design/printing/photocopying – Fonts are small and hard to read [38]. **Lag in updating registers to match new guidelines**– Many countries may not have updated their registers based on adoption of IPTp 3+. In places, where this has been done, printing and training on the new forms takes time. **Data use by districts encourages facility reporting** – In Uganda, districts actively using data to identify and prevent stock-outs had over 90% facility reporting rates [45] **Feedback (lack of guidance and insufficient emphasis on accuracy)** – Lack of guidance on how to provide feedback; feedback tends to be based on district officers' "impressions" [42]. Moreover, districts do not commonly provide feedback to facilities with regard to the accuracy of data, only promptness and completeness [35] **Confusing denominators** - HIS and national surveys use different denominators, which can lead to confusion for interpreting the findings, and many providers/supervisors may not know that HIV+ women on contrimoxazole should be excluded from denominators in HIS indicators [57].

**Anecdotal, no documentation found yet: (a) Perverse incentives - incentive to report fewer cases (elimination, or in the places where facilities are required to generate income based on service utilization), incentive to report more cases (performance-based financing, or to divert commodities for private sale or use). (b) Client cards are stored with other important documents by the male head of household and clients may have difficulty accessing them. (c) Lack of systems to address data quality/accuracy errors – for example, treating more people than tested should trigger routine questions upon submission or be incorporated into forms or electronic data systems.*

Resources

- Provider Behavior Change Implementation Kit
- PRISM assessment tools
- PSI Keystone Design Framework: Diagnose Phase Resources

Step 4. Involve target groups in all stages of design

It is common practice to convene implementing partners, government staff, donors, and researchers to design a new program or tool. These teams bring valuable skills and resources to the table, such as financing, public authority, technical expertise, and the ability to implement activities or disseminate findings at scale. Although some team members have experience or training as service providers, the group may lack current, first-hand experience with navigating the day-to-day realities of providing or using services. Moreover, the written evidence base, though useful, often lacks contextual detail or involves data from other settings.   Mindfully involving providers and clients throughout the design process - both in understanding behavioral determinants and in program design - can ensure that interventions are feasible and desirable for users and sustainable to implement in the long-term.

A group seeking to improve provider adherence to MIP guidelines, for example, may use the clinical guidelines to develop an algorithmic job aid, but may fail to understand what problems the provider is trying to solve in the context of seeing a woman during an antenatal visit, whether a job aid is the right approach, what form it should take, whether providers would be willing to consult a job aid in front of a client, whether the job aid is readable from where the provider sits in the consultation room, and/or other priorities that may overtake the need to follow an algorithm (such as the client complaining of other serious ailments that require immediate attention while fifteen clients are waiting outside). Involving ANC nurses and clients in the process of defining the challenges, translating research findings for stakeholders who sit at the district, regional and national level, and generating and testing ideas may help prevent some of these gaps in understanding.

User involvement can take varying degrees (Figure 3). On the far left, it can be mainly informative, where insights are founded on data and theories about user behavior but the design team generates all the ideas and makes all the decisions [46]. On the far right, human-centered design is a process where the design teams conduct rapid immersive activities to engage directly with users to understand their perspectives (as opposed to the research being conducted by a separate team), and users are part of brainstorming and testing solutions [46, 47].

Figure 3. Spectrum of user involvement

Less participation

More participation

Informative	Consultative	Human-centered
The user is seen as a source of information. Data from interviews and theoretical models *inform* design decisions, but users do not *make* these decisions.	Informative methods *plus* user-testing. Design teams propose solutions to users, so users can provide feedback and lend additional insight on user motivations and experiences.	Informative and consultative methods *plus* rapid ethnographic fieldwork to cultivate empathy for the user experience; involving users in generating ideas and testing and revising solutions

The points on the spectrum are illustrative, since there are degrees of participation between them. For example, a consultative process may involve convening a focus group to obtain provider feedback on a draft job aid, but a slightly more user-centered version might involve having the providers use the tool with clients for three days, taking notes or voice recordings to document their experiences, and giving feedback to the design team.

There is limited research on the effectiveness of human-centered design in low-income countries, much less in malaria service provider behavior change. However, a review of health care interventions (including provider-facing ones) in both high and low-income settings found that studies comparing HCD interventions to traditional interventions showed **greater satisfaction, usability, and effectiveness** [48].

Methods and tools for involving users can be drawn from many fields, including human-centered design, service design (a subset of HCD), participatory research, and communication. See the **Resources** section for examples.

Although involving communities/users is an acknowledged best practice in global health, it can be neglected in the rush to complete projects [49]. However, involving users does not always need to take a lot of time. Gathering providers for formal or informal focus groups can be integrated into other monitoring or facility-based activities. Pretesting tools can take as little as a day, while a human-centered design sprint can take as little as 3-5 weeks (complex interventions, which may require multiple iterations, will take longer).

Resources

- How to Test Creative Concepts
- Demand for Health Services Field Guide: A Human-Centred Approach
- The Field Guide to Human Centered Design
- Service Design Tools
- PSI Keystone Design Framework: Decide Phase Resources
- PSI Keystone Design Framework: Design Phase Resources

Step 5. Match interventions to the identified levers of behavior

Programs will likely require a wide range of SBC approaches

There is no silver bullet for changing behavior, and a holistic package is needed to tackle the complex nature of behaviors within the service delivery sphere. When both service delivery and communication partners are present, it is important to coordinate to take advantage of the unique skill sets, geographic coverage, and resources each may bring. The Service Communication toolkit's "Operational Considerations" page has comprehensive information on the different forms that coordinating between service delivery and SBC partners may take throughout design, implementation and monitoring and evaluation.

Below a snapshot of the range of possible interventions based on the levels of socio-ecological model (see Figure 2 and the tables in Section 3 for the corresponding behavioral factors at each level). Each intervention can be strategically coupled with other interventions, potentially amplifying their effects. Interventions at the client and community levels tend to have more of a service communication angle, though some of them can also directly improve provider motivation. Interventions at the provider, facility, and organizational level can also be used to target peer/provider norms directly. This list is for illustrative purposes only; it should not replace the process of co-generating intervention ideas with users and stakeholders.

Table 2. Interventions for provider behavior change and service communication, clustered by level of the socio-ecological model (see Figure 2 and the tables in Section 3 for the corresponding behavioral factors at each level)

LEVELS & AUDIENCES	INTERVENTIONS
CLIENTS *clients and caregivers*	• Client-facing SMS • Phone hotlines/integrated voice response • Home visits • Mass media • Print materials (such as posters, leaflets, point-of-care materials, messages on drug packaging and health cards)
PROVIDERS *Clinical and non-clinical staff (doctors, nurses, EHTs, lab technicians, pharmacists, medical records, etc).*	• Peer-to-peer or peer group discussions (clinical meetings, grand rounds, etc.) • Distance learning or access to educational and professional development opportunities or resources • Provider-facing SMS • Self-reflection exercises, values clarification and attitudinal transformation exercises

LEVELS & AUDIENCES	INTERVENTIONS
	• Medical detailing visits/total office call (in-person sales visits used by pharmaceutical representatives; can be similar to supportive supervisory approaches) • Job aids/clinical decision support tools (to reduce cognitive burden, change defaults and nudge providers toward certain diagnoses or treatment plans) • Vignettes (such as case studies or videos that models the desired thought processes and behaviors)
CLIENT-PROVIDER DYAD	• Job aids to improve provider counseling • Job aids to improve history-taking (ex: help clients communicate level of pain, or help providers calculate gestational age) • Client-provider pledges • Client monitoring/follow-up by provider or community-based agent • Fishbowl-style discussions for clients and providers to discuss perceptions of quality of care, provider attitudes toward clients • Community-provider dialogues
FACILITY *Officers-in-charge & unit heads*	• Recognition (by colleagues, supervisor, community) • Collaborative improvement initiatives • Performance feedback (performance review, clinical audits, performance tracking charts; peer review, self-assessment) • Performance-based financing • Management meetings • Changes to facility processes, equipment or forms to simplify client and provider experience (ex: in facilities without water supplies, selling plastic sachets of water at cost so women can take medicines at ANC) • Adjusting staff responsibilities and schedules, adding staff • On-the-job training
COMMUNITY *Spouses, relatives, friends, workplaces, community groups, traditional healers, drug shops, local traditional & religious leaders*	• Health fairs • Community groups providing health education and referrals to their members (CHSS model) • Care Groups • Group ANC • Community monitoring (alone or jointly with facility) • Community dialogues • Mass media • Open houses/facility tours for clients • Wellness days for hard-to-reach groups, like adolescent boys and men

LEVELS & AUDIENCES	INTERVENTIONS
	• In-reaches (mobilize selected clients/groups to attend facilities on select service days along with providing additional providers to mentor or support service provision) • Outreaches (providers go to communities to provide services, common in vaccinations) • Facility makeover (improving the physical environment based on assessed community and provider needs, while involving community artisans in the process). • Facility reviews/ratings/feedback systems • Branding/accrediting facilities for quality services • Health committee meetings to broker community-facility issues, address bottlenecks
NATIONAL, REGIONAL, DISTRICT, OR ORGANIZATIONAL *District and regional supervisors; NMCPs & other MOH departments in RMNCH & supply chain, implementing partners; professional associations and other training and accreditation institutions*	• Advocacy to remove bottlenecks, provide public legitimacy to related interventions. • Provide opportunities for providers to meet license renewal requirements • Influence the agenda/discussions at professional association meetings • Strengthening the management skills of facility in-charges and unit heads • Performance feedback to facilities/districts; using scorecards; conducting supervision/mentoring/coaching visits; training/oversight of supervisors to ensure they don't propagate misconceptions during visits • Updating pre-service curricula • Making national tools (like HMIS forms and standing orders) user-friendly and user-centric • Guidelines and templates for data quality and data use for service-point level • Human resource management (ex: minimizing staff transfers)

Interactive, synergistic approaches tend to be more effective

The choice, effectiveness, and sustainability of the intervention package will likely depend on the behavior of interest, the target group, the behavioral determinant(s) being targeted, the level of user input into the selection of approach and how well it was tested and refined based on actual service contexts. A recent systematic review [50] on provider performance provided insights on what types of interventions work but does not explain why they worked. Also, many of the interventions listed above are new and/or unpublished and may not have been included in the review.

Table 3. Summary of findings from the Health Care Provider Performance Review study [50]

EFFECT SIZE	INTERVENTION AND FINDINGS
🔴	Providing printed information or job aids to health-care providers as a sole strategy is unlikely to substantially change performance.
🟢	Information and communication technology might lead to moderately large improvements or no improvement, but it typically has small-to-modest effects.
🟡	Training only or supervision only might produce large improvements or no improvement, but both strategies generally tend to have moderate effects. It might be more effective to combine training with other strategies, such as supervision or group problem solving.
🟡	Group problem solving only might bring about large or small improvements, but moderate effects are typical
🟡	Financial incentives for health-care providers, and health system financing strategies and other incentives might lead to large or small improvements, but these incentives typically have modest to moderate effects
🟢	Multifaceted strategies targeting infrastructure, supervision, other management techniques, and training (with and without financing), and the strategy of group problem-solving plus training might result in very large or only modest improvements, but such strategies tend to have large effects

The review found substantial variation in effect sizes among similar interventions, suggesting that the **quality of implementation** and **context** matter. When it comes to trainings, for example, other studies have found that a low-dose, high-frequency approach to training, using simulations or actual work environments, frequent practice, problem-based learning and interactive discussion of case studies leads to improved learning outcomes [51, 52]. This type of approach can also facilitate the participation of providers whose household and caregiver responsibilities make them less likely to be able to participate in more traditional off-site or residential trainings. When it comes to SMS, two-way approaches seem to be more effective in low and middle-income countries [61]. However, only one-way SMS malaria interventions with providers have been published; these interventions have had mixed results [62, 63].

Although multifaceted strategies are capable of producing large effects, the number of elements did not correlate with effect size, so programs should be careful to avoid overly complicated and ultimately, time and resource-intensive design packages [50]. However, judiciously combining methods – such as training to introduce new processes or clear misconceptions, or group problem-solving to address emergent challenges may be sufficient [50].

It is also important to temper expectations. The authors of the above review said, “even after implementing improvement strategies, important performance gaps will probably remain. Assuming typical baseline performance of 40% and a [very] optimistic strategy effect of 30 percentage points, post-intervention performance would be 70%...or about a third of clients not receiving recommended care [50].” Moreover, the effect may be diluted over time; the authors recommend longer follow-up periods. Importantly, effect sizes were higher in public sector settings compared to private and community settings, but it is not clear why this might be the case [50].

Overall, the evidence shows that interactive and multi-level approaches are more likely to be effective than the passive dissemination of materials. However, it is not clear how long the effects last, or what type of follow-up intervention is needed to sustain them.

Resources

- Service Communication toolkit
- Health Care Provider Performance Review Database
- TCI University Resource Collection
- Malaria SBCC Evidence Database
- SBCC for Malaria in Pregnancy Toolkit
- PSI Keystone Design Framework: Deliver Phase Resources

Step 6. Use a holistic approach to monitoring and evaluation

Suggestions for data collection, primarily for formative research or situational analyses, have been proposed at nearly every stage in this document. Below are some key areas to assess during the design, monitoring and evaluation stages, along with data sources, indicators and questions. In addition to tracking changes in behaviors/services/data quality, it is important to also assess changes to the determinants of provider behaviors, as well as the context in which the intervention unfolded.

Outcome monitoring and evaluation

AREAS TO ASSESS	POTENTIAL DATA SOURCES	RESOURCES FOR INDICATORS AND QUESTIONS*
Changes to behaviors and sub-behaviors – Provider behaviors to monitor include adherence to case management and malaria in pregnancy guidelines, and measures of data quality, such as concordance (accuracy), timeliness and completeness.	Register reviews and observations as part of health facility assessments and supportive supervision. Client exit interviews and pharmacy consumption data as means of validation; pharmacy data can also help with accounting for stock-outs. HMIS data	Reporting and data quality: • PRISM assessment tools (performance diagnosis section - see malaria-specific indicators) • (R)DQA tools (countries sometimes have a malaria-version of this) Case management and MIP– • SME task force recommendations • Correction factor for testing rates from HMIS • Framework and Checklists for Supportive Supervision/OTSS+ (PMI Impact Malaria; contact Keith Esch at kesch@psi.org) • Monitor antibiotic overuse (negative effect of increased adherence to negative test results) [53]
Changes in behavioral determinants - It is not easy to get reliable data on provider behavior. Service statistics frequently suffer from data quality issues, and other	Provider interviews as part of health facility assessments and supportive supervision.	Reporting and data quality • PRISM assessment tools (self-confidence, competency, and

AREAS TO ASSESS	POTENTIAL DATA SOURCES	RESOURCES FOR INDICATORS AND QUESTIONS*
means of collecting data (such as health facility assessment and supervision visits) can be resource-intensive. Measuring changes in behavioral factors (such as attitudes and norms) among both clients and providers provide early indications that the intervention is having an effect.	Pre and post-tests when conducting activities. SMS/mobile surveys	information culture; feedback; training, etc). General questions about behavioral determinants that can be adapted to malaria service providers: - Malaria SBCC Indicator Reference Guide - Social and Behavior Change Indicator Bank for Family Planning and Service Delivery - Sample case management HFA questions from Guinea - Malaria Behavior Survey
User (provider and client) satisfaction and estimates of time burden also provides information on how suited the intervention is to the context and the possibility of sustainability and scale-up. For evaluations, changes to behavioral determinants provides evidence of how the intervention worked, not just if it worked.	Provider interviews Client exit interviews Pre-post tests when conducting activities.	These are from family planning and could be adapted to malaria: - Social and Behavior Change Indicator Bank for Family Planning and Service Delivery - Family planning client satisfaction survey questions
Document the context, the implementation details, and lessons learned. Context has been shown to be a significant determinant of the effect of any strategy. Documenting how strategies were tailored to the context [50], what aspects of the context enabled or hampered the intervention, and the workarounds used will greatly improve our understanding of what interventions can be replicated, and where.	Activity reports Focus group/after-action reviews/lessons learned meetings	- Checklist for reporting on malaria social and behavior change program evaluations - USAID guidance on after-action reviews

It is ideal to conduct **longer-term follow-up** (the review above suggested 12 months) to understand the rate at which effects unfold [50]. For example, there is evidence that collaborative improvement approaches have been successful in Sub-Saharan Africa, but it can take 9.2 months for facilities to reach

80% performance targets and 14 months to reach 90% performance targets [54]. Moreover, follow-up may show that providers need reinforcement with new or different interventions to further boost practice or address new gaps. Last but not least, long-term follow-up is useful for knowing whether short-term gains following trainings were sustained.

Process and output monitoring

AREAS TO ASSESS	POTENTIAL DATA SOURCES	TYPES OF INDICATORS AND QUESTIONS
Quality of user involvement during the design process	Design and testing reports	Number and range of users involved (easy-to-find users vs. users from both ends of the extremes, in terms of performance, setting, etc) [55].
Quality of learning during the design process	Design and testing reports	Whether the team learned anything surprising about the context in which some users might interact with/use the services/tools [55] Number of different solutions proposed [55] Number of solutions tested by users; for how long How many of the potential solutions underwent major iterations as a result of input from stakeholders and users [55]
Costs	Financial data	Differentiate between design costs and implementation costs
Fidelity of implementation	Activity reports Supervision checklists (tailored to activity) Audit facility documents (ex: meeting minutes)	For what percent of eligible client consultations providers used the tools For procedural changes, what proportion of the eligible days/weeks was it done as planned?
Outputs	Activity reports	Number of interventions introduced Number of group discussions held Number of tools developed
Reach and coverage	Activity reports	Number of users who participated or who were reached by the intervention.

Strengths and limitations of selected data sources

Service statistics are best for assessing reporting behavior (level of concordance, completeness, timeliness). Because the data may be of poor quality, caution needs to be taken when using them to assess adherence to case management and malaria in pregnancy guidelines. Comparing data sources within a facility would be ideal – cross-checking HMIS forms with laboratory and pharmacy records can provide an estimation of how much over- and under-reporting may be present. Many of the alternate data sources will likely have problems too, and the process will take more time. However, it can raise confidence in the quality of the behavioral data reported.

Household surveys, like the MIS, DHS, and the Malaria Behavior Survey are imperfect measures of provider performance because they collect data among community members. For example, IPTp questions involve women who were pregnant in the past two years. The women may not recall what medicines they took during their antenatal visits, especially if the pregnancy was not recent, and if the provider did not explain what was being given. Similarly, caregivers of children under five years of age who sought care for fever in the past two weeks many not accurately recall if the child received a finger or heel prick (for malaria tests) or what medicines were prescribed (particularly if multiple medicines were given). On the other hand, household surveys better capture care-seeking and ANC behaviors because they take place in the community and may reach those who use and do not use services.

Client exit interviews, because they are done immediately after service provision, may be a better way of validating provider performance or quality of service while providing an opportunity to collect data on client satisfaction, comprehension of counseling given, and intention to complete referrals or other follow-up services. However, there may be a risk of providers changing their behaviors if they know such surveys are taking place (Hawthorne effect).

Service Provision Assessments (SPA) or Service Availability and Readiness Assessments (SARA) are cross-sectional facility surveys that provide important information on the proportion of facilities that are equipped to provide MIP and case management services. They examine the availability of trained staff, equipment, and commodities. However, there is little other information that might be used to help explain provider behavior, and it is not clear how much these surveys can be tailored.

Health facility assessments, with their ability to collect data through provider interviews, observations, registers, and client exit interviews may serve as a gold standard for measuring facility readiness and performance. At this time, these assessments are not as standardized as the MIS and DHS, which can make it hard to compare findings but this may pose opportunities for developing better questions to measure determinants of provider behavior. [56]

Supportive supervision visits present an opportunity to collect information from providers and the facility. These visits are long and costly, and supervisors will need training on how to collect data. There is also a significant risk of bias if supervisors are the ones asking providers about their beliefs and attitudes. Lastly, data collection can detract from time spent coaching and troubleshooting and may not be a good use of government supervisors' time.

Finally, **qualitative feedback** on the interventions being tested in the form of in-depth interviews and focus groups will be useful for understanding how and why certain outcomes were observed.

Table 4. Pros and cons of different data sources

DATA SOURCE	PROS	CONS
Service statistics	Best for assessing quality of reporting	Poor quality of reporting may mean it is not a reliable source for data on adherence to clinical guidelines
Household surveys	Can reach people who access and do not access services	Recall bias since data is from community members, not providers
Client exit interviews	Less likelihood of recall bias	Hawthorne effect (providers changing their behavior if they know they are being observed)
SPA or SARA surveys	Can indicate if there is a problem in terms of equipment, training or supervision	Cannot lend insight on attitudes/beliefs/norms affecting provider behavior, nor quality improvement practices. Not clear how much these surveys can be tailored. Infrequent.
Health facility assessments	Can be comprehensive and flexible; can assess multiple aspects influencing behavior and performance (the "why")	Not standardized; infrequent.
Supportive supervision	Part of routine programming; can be comprehensive and flexible; can assess multiple aspects influencing behavior and performance (the "why"), and provide both qualitative and quantitative info.	Can be expensive; data collection can distract from mentorship and coaching; skilled supervisors are needed to use information appropriately.`
Qualitative methods (focus groups, in-depth interviews)	Provide information on the "why" (motivators/barriers)	Cannot provide information on how widespread these motivators/barriers are.

Conclusion

Making strides in case management and malaria in pregnancy will require a strong focus on provider behavior. Providers serve as gatekeepers for the uptake of IPTp, malaria testing and adherence to test results, and quality of malaria surveillance data.

A behavioral lens can be useful for understanding how to improve provider performance, nourish community-facility linkages and, consequently, strengthen service delivery and the health system overall. Best practices include defining and prioritizing behaviors, identifying the target groups and their influencers, diagnosing behavioral determinants, involving users (providers and clients) in intervention design, choosing appropriate interventions and finally, collecting the types of monitoring and evaluation data that can tell the story of how the program fit the context and its effect on providers' motivation, behavior, and ultimately, quality of care.

Resources

- Developing M&E Plans for Malaria SBC Programs: A Step-by-Step Guide
- See resources listed in the table above

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