Low uptake of intermittent preventive treatment in Ghana: An examination of health system bottlenecks

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Despite the devastating impact of malaria in pregnancy in Africa, the uptake of intermittent preventive treatment for malaria prophylaxis has remained considerably low. In Ghana, the uptake of optimal doses (≥ 3doses) stands at 38.5%, despite the fact that antenatal care uptake is 87.3%. In this article, we undertake a review of existing bottlenecks that determine the underlying factors affecting optimal uptake in the country. The World Health Organization's health system strengthening framework is adapted to examine these factors. Finally, a health information strategy is proposed to ameliorate the underlying issues identified.

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Malaria during pregnancy has unequivocally poor health outcomes for a pregnant woman and the developing fetus.[1] A recent systematic review and meta-analysis of seven trials suggests the association of malaria in pregnancy (MIP) with severe maternal anaemia, cerebral malaria in the woman and low neonatal birthweight, which could result in preterm delivery and eventual death of the child and/or mother.[2] It is estimated that, globally, 125.2 million pregnant women are at risk of malaria, with 81.5% of these living in sub-Saharan Africa.[3] Consequently, the sustainable development goals (SDGs) address MIP through setting ambitious targets of eradicating malaria among pregnant women, ending neonatal mortality and reducing the maternal morality ratio to 70 per 100 000 by 2030.[4]

In 2006, as a response to MIP, the World Health Organization (WHO) recommended tripartite integrated interventions for pregnant women in malaria-endemic regions. These are: intermittent preventive treatment during pregnancy using sulfadoxine-pyrimethamine (IPTp-SP); insecticide-treated mosquito nets (ITNs); and intermittent screening and treatment (IST).[5] Despite remarkable successes made in ITN and IST uptake, coverage of IPTp-SP remains low, at an average of 11.77% in sub-Saharan Africa.[6]

IPT is a dose therapy of an antimalarial drug administered monthly, after 16 weeks' gestation (quickening), to pregnant women in malaria-endemic regions.[5] In many African countries, including Ghana, IPT is administered as a directly observed therapy (DOT) during each scheduled antenatal care (ANC) visit.[7]

Many countries in sub-Saharan Africa continue to experience a huge disparity between ANC visit uptake (at 75%, on average) and IPT coverage.[6] This illustrates substantial missed opportunities at ANC clinics.[8] Adopting the WHO's building blocks, this article discusses the intricacies of health system challenges relating to the low IPT uptake, and further propose a viable solution towards establishing a strong health-information framework aimed at monitoring and evaluating the exact impediments that affect the successful implementation of IPT.

Context and problem statement

Ghana is situated in West Africa, with a population of 27.4 million, and a life expectancy of 61.3 years.[9] In 2014, the World Bank reported that Ghana had spent only 2.13% of its gross domestic product on health, with out-of-pocket spending contributing 26.84%. Maternal and infant mortality stand at 319 per 100 000 and 41 per 1 000, respectively (missing the target for Millennium Development Goals 4 and 5).[6] Estimates further show that malaria in pregnancy alone contributes to 9.0% of maternal deaths, and is the single highest contributor to all out-patient department admissions (197 017 cases) among pregnant women.[10]

The Ghana Health Service adopted sulfadoxine-pyrimethamine (SP) as the appropriate medicine for IPTp in 2003.[11] In 2004, it updated the antimalarial drug policy to reflect the WHO's guidelines on how IPT should be administered.[11] Although chapter 4 of the antimalarial drug policy clearly stipulates that IPT shall be administered as a DOT on a monthly basis during ANC visits until delivery,[11] available data from the demographic health survey[6] show a significant discrepancy between ANC coverage (≥4 visits) and IPT uptake (≥3 doses) (Fig. 1).

Despite Ghana making remarkable successes in closing the deficit between ANC visit and IPT uptake (from 68.8% in 2003 to

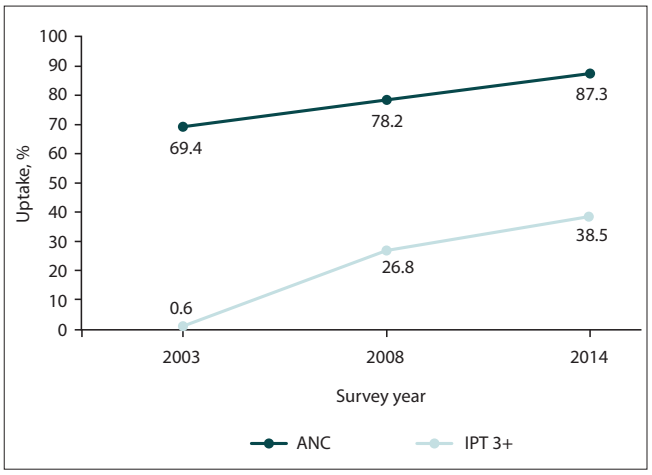

Fig. 1. Discrepancy between ANC coverage and IPT 3+ uptake.[6] (ANC = antenatal care; IPT 3+ = ≥3 doses of intermittent preventive treatment for malaria prophylaxis.)

48.8% in 2014), it still has over 50 000 pregnant women who are unprotected.[6]

Rationale and limitations of using WHO health system building blocks in the context of malaria research

This article recognises the importance of having an integrated framework that responds to several facets of a health system challenge. This is reinforced by the fact that low IPT uptake is complex and multifaceted, and therefore demands a holistic approach in diagnosing the challenges involved.[7] Employing the WHO health system building blocks therefore provides a basis for a common comprehension of the pertinent issues around IPT uptake in a resource-constrained setting such as Ghana, which could be generalised for use in similar environments.

While the framework provides a coherent understanding of system dynamics related to a health challenge,[12] its failure to recognise the critical importance of interaction among the building blocks limits an understanding of their effects on a health system.[13] Health systems, like living organisms, present consistently complex interactions that create new dynamics and trends and, as such, demand tailored responses. For example, between 2012 and 2013, the WHO updated the IPT policy to increase the number of recommended doses before delivery from 3 to 5,[5] yet the tools for capturing data were still designed for a 3-dose system.[14] Such an inconsistency suggests that it is worthwhile examining the feedback loop and communication patterns among the building blocks within a health system, and how the system is continually shaped by these factors.

The framework lacks elements of focus on user demand, behaviour change and community-related issues, that undermine the weight of each block.[13] This leads to an abysmal understanding of inputs, outputs and outcomes within a health system, and how they are interlinked with the user demands of a health system.[13] For example, in understanding IPT uptake, service delivery and the health workforce have a strong effect on demand, a direct outcome, whereas finance and health information are classified as inputs. Attaching weights will guide the building blocks' use in assessing demand-related issues and behavioural change thereafter.[13]

Diagnosing low IPT uptake: Focus on the six building blocks

Governance

According to the Ghana Health Service, private maternity homes make up 19% of the total of facilities that provide maternal care.[15] The Demographic Health Survey[6] also indicated that 8% of all pregnant women had made ≥4 ANC visits to private facilities, yet only 3.34% of these women had received ≥3 IPT doses, which was far lower than the national average of 38.5%. Anemena *et al.*[15] categorically attribute this difference to weak regulations, lack of compliance with national protocols and inadequate oversight by health authorities to enforce existing laws within private facilities.

Again, section 4.2 of the antimalarial drug policy of Ghana[11] that details the procedures is limited, and does not adequately adopt the comprehensive recommendations of the WHO, as updated in 2008. For example, the policy fails to follow the WHO's guidelines on the management of side-effects, which are among the major reasons for high dropout rates.[5] This situation has resulted in health workers discontinuing IPT when side-effects manifest after a second dose.[16]

Financing

Although Ghana in 2003 implemented a free maternal healthcare policy that removed all forms of official financial barriers,[17] other financial challenges arising from under-the-table payments and transportation costs continue to hinder the utilisation of services.[18] IPT and other ANC interventions are administered in health centres that are sparsely distributed in the country.[18] Transportation to these inequitably distributed facilities manifests as a barrier that affects the uptake of IPT among poor women in rural areas. A disaggregation of the Demographic Health Survey[6] by place of residence and wealth indicates that whereas IPT 3+ in urban areas stood at 41.9%, rural areas were trailing with 35.8%. Similarly, pregnant women in the highest wealth quintile had attained a coverage of 50.6%, while those at the lowest only reached 36.6%.[6]

Overall, MIP continues to be among the most underinvested areas in developing countries, by donor funding.[19] For example, the US President's Malaria Initiative (PMI), Ghana[20] committed only USD990 000 (3.54%) of its operational budget to activities to strengthen IPT uptake in the health system.

Undoubtedly, operational MIP research has been chronically underfunded, culminating in stagnation in innovation.[21] According to a 2014 National Malaria Control Programme (NMCP) report, although it made significant efforts in executing most of its programme activities, two key research projects pertaining to the impact of IPT and the underlying reasons for high IPT dropout had not been carried out owing to lack of funds. It is apparent that without a commitment to intensive research to influence behavioural change, an increase in IPT uptake will remain a mirage.

The government of Ghana's matching funding for the NMCP has been woefully inadequate. The Global Fund to Fight AIDS,

Tuberculosis and Malaria (GFATM) continues to be the largest donor, together with supplements from the Department for International Development, the US Agency for International Development (USAID)'s PMI, the United Nations Children's Fund (UNICEF) and the WHO.[10] This shortfall continually threatens the sustainability of MIP efforts, especially in the post-GFATM era.

Health workforce

Ghana has one of the world's most severe practitioner-to-patient imbalances in midwives and nurses (MN). With an MN ratio of 0.926 midwives to 1 000 people,[22] Ghana suffers a huge deficit that clearly affects the implementation of health programmes, especially at periphery facilities.[10]

There is limited understanding of Ghana's IPT policy among health workers.[16] A study conducted to assess the knowledge of health workers according to the national guidelines on dosing, time, restrictions and DOT strategy found that only 47.8% of health workers had a comprehensive knowledge of the IPT policy.[16] The study further revealed that only 49.3% of midwives and frontline nurses could demonstrate full IPTp competence according to the national guidelines. This is very surprising, considering the fact that these cadres of health workers play the most crucial role in promoting IPT among pregnant women.

Product and technology

Chico *et al*. [7] have identified supply-chain strengthening as a key determinant in preventing periodic stock-outs of SPs. Yet the supply chain of SPs in Ghana is continually hampered by periodic stock imbalances and stock-outs.[10] Although the National Malaria Programme in 2014 purchased 19 878 570 tablets and distributed them to all regions in the country, existing transportation bottlenecks hindered disbursement to periphery facilities in the districts. This resulted in stock-outs of SPs within almost every district.[10]

Local pharmaceutical companies have limited capacity to meet the growing demand for quality SPs, especially in sub-Saharan countries.[7] According to the NMCP's 2014 report,[10] out of all SPs procured, local pharmaceutical companies could supply only 16.2%, making the programme dependent on international companies for the remaining 83%. Considering the bureaucracy involved in importing drugs, the inability of local companies to respond to the demand for SPs results in low responsiveness, especially during emergency stock-outs.[23]

Also, the growing resistance of SPs, and the non-existence of a medicinal alternative, encourage low uptake, especially in instances where resistance has been reported.[8]

Health information (monitoring and evaluation)

Tactical use of health information, intelligence and research forms an integral facet of governance and leadership function.[12] The ability of health information systems to capture and report reliable information on health determinants, systems performance and health status improves decision-making at every level of authority.[12] This includes standard indicators that provide accurate data. Currently, the main indicator used by donors and government for making IPT interventions is the number of women who receive SP during ANC visits.[10] This indicator has been misunderstood and captured differently in different studies. For example, the multiple indicator cluster surveys (MICS) report[10] pegged it at IPT 2+, and recorded 64.6%, while the Demographic Health Survey[6] calculated IPT 3+ at 38.5%. Such non-standard and inconsistent indicator reporting creates discrepancies that undermine the importance of evidence in decision-making.

Ghana, like most malaria-endemic countries, lacks integrated monitoring and evaluation systems to capture the preventive and therapeutic efficacy of IPT.[24] These are important in detecting and monitoring parasitaemia prevalence, safety and pharmacovigilance of antimalarials in pregnant women.[24]

Data validation teams play an important role in generating quality data for decision-making. In Ghana, data validation teams are integrated into the district health management teams, and they are responsible for ensuring data quality.[14] Despite being vital in ensuring data quality, they are highly inadequate in number, especially across rural districts. Reports from USAID facility assessments[20] indicate that only 38% of districts had functional data validation teams. This obviously raises questions about the quality of data reported on IPT uptake from primary facilities.

Service delivery

Health systems are strengthened to deliver safe and quality services, with the goal of improving health outcomes.[12] Service delivery difficulties with IPT in Ghana are compounded by accessibility and practicality challenges, sociocultural barriers as well as general relationships that exist between providers and users.[25] According to the Demographic Health Survey,[6] 13.8% of pregnant women still do not have access to ANC. Late presentation to ANC clinics also plays a significant factor in low IPT uptake.[26] A study found that the median gestational age for first ANC visits was 3.6 months, with rural dwellers dipping even further, to 3.7 months.[6] Given that IPTp is administered after the first trimester of pregnancy, late presentation thereof will affect the achievement of IPT 3+ uptake.

Existing relationships between providers and clients, together with the perceived low quality of ANC services, influences users' choice and target of ANC.[25] A study in the Ashanti region of Ghana found that pregnant women's preference for seeking care from traditional birth attendants (TBAs) was due to perceived unfriendly and rude behaviour on the part of professional health workers, as compared with welcoming TBAs.[27]

Mubyazi *et al.*[25] indicate that although SPs were available in primary health facilities, the absence of essential utilities such as disposal cups and clean drinking water constrained IPT implementation as a DOT.

Proposed strategy for strengthening health information monitoring and evaluation systems for IPT uptake

A robust health information system is one that detects, communicates and contains events that threaten public health, including emergencies.[12] To this end, timeliness and precision are key. Ghana must invest immensely in electronic data capture

at every level of data entry that will aggregate real-time data into the existing district health management information systems. This will allow health managers to make swift and timely interventions, especially during emergencies and SP stock-outs.

The research community, WHO Ghana and the Ministry of Health should collaborate to establish monitoring and evaluation plans for growing SP resistance and its impact on IPT effectiveness. Furthermore, the malaria technical working group should readjust their selection of sentinel sites for MIP parasitaemia transmission, especially in hard-to-reach rural areas, as well as gather exact data on the predictors (social, economic and cultural) that influence ANC uptake.[7]

Independent data validation teams must be instituted and empowered at each administrative level (from facility to district to regional and national). To motivate validation teams, Ghana should consider adopting Rwanda's performance-based financing.[28] With the growing preference for electronic data systems, validation teams could validate real-time data remotely or virtually.[29]

Finally, stakeholders and donors must reinforce their commitment to monitoring and evaluation through working in co-ordination. To make judicious use of resources, donors must agree to consolidate efforts and produce data that are consistent, reliable and timely. For example, instead of USAID conducting demographic health and survey and MICS by UNICEF, there should be a consolidated survey that would take place at shorter intervals, to understand the landscape better.

Conclusion

Although Ghana has made quite significant strides in improving IPT uptake, from 26.8% in 2008 to 38.5% in 2014 (the world's second highest after Zambia),[10] there is still a need for the government to recommit itself towards rigorously pursuing the fight against MIP. Given the ambitious SDG target of reducing the maternal mortality rate from 319 to 70 per 100 000 live births,[9] Ghana must dedicate itself to increasing its overall health budget from 8.9% (in 2016)[30] to meet the Abuja Declaration minimum of 15%. In ensuring sustainability of the malaria programme, giant steps should be taken towards attaining a 50/50 split of disease funding between government and development assistance.

Finally, policy and practice must be consistent at all times, to ensure that service delivery follows the latest and updated guidelines. This also means that Ghana should make essential investments in enhancing the feedback loop between managers and frontline workers. More importantly, training institutions should seek to adopt the latest MIP guidelines during instruction.

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