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Organizational Facilitators and Barriers for the Integration of Dengue into The National Malaria Control Program In Tanzania: A Case Study

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Abstract

Background

Dengue is classified as among Neglected Tropical Diseases (NTD) in Tanzania. Dengue and Malaria are mosquito-borne diseases, however, unlike Malaria, Dengue is neither programmatically integrated into the Malaria program nor in any other vertical program. However, the World Health Organization (WHO) recommends that Dengue control to be part of Integrated Vector Management (IVM).

Study objective

To explore organizational facilitators and barriers to the integration of dengue into the National Malaria Control Program (NMCP) in Tanzania.

Materials and Methods

A cross-sectional exploratory study design was conducted between July and August 2020 whereby 15 key informants from the Ministry of Health, Community Development, Gender, Elderly, and Children (MoHCDGEC), National Malaria Control Program (NMCP), and NTD program were involved. An inductive thematic analysis approach was applied to analyze the gathered data where themes, codes, and categories were determined by the data collected.

Results

Readiness of the available human resources to support the integration, the existence of a defined organizational structure, the existence of policy and guidelines for integration, the availability of funds for integration, and stakeholders' interests; were found to be organizational facilitators for the integration of dengue into NMCP in Tanzania. The political will of the government forms an integral part of the enabling factors for organizational factors for dengue integration into malaria programs. However, additional costs, varying donor interests, and additional workload were found as organizational barriers to the integration of dengue into the NMCP.

Conclusion

The facilitators and barriers revealed by this study on the integration of dengue control to the NMCP act as an eye-opener toward the integration of dengue into IVM. Concerted efforts are therefore advocated toward the implementation of IVM with dengue integrated. Moreover, large-scale study can be conducted on the mechanisms and best approaches of integration of dengue into malaria programs.

Keywords: *Integration, Barriers, Facilitators, Malaria, Tanzania, Control programs, Neglected Tropical Diseases, and Dengue.*

Background

Several studies have indicated that there is no universal definition or concept of “integration”. However, multiple integration models from both the healthcare and business literature have been proposed (1). Integration of health care services may be traced back to the 1970s when World Health Organization (WHO) propelled the idea for influencing the primary health care model. The concept gained momentum after the “Alma-Ata Declaration on Primary Health Care in 1978” which advocated for health care for adolescents, children, and elderly (2). This called for movement which demanded an improved and coordinated healthcare systems (integration). WHO has provided a broad concept of integrated health systems which is “the organization and management of health services so that people get the care they need, when they need it, in ways that are user friendly, achieve the desired results and provide value for money” (3). Integration is also the process of bringing together common functions within and between organizations to solve common problems, developing a commitment to shared vision and goals, using common technologies and resources to achieve such goals (9)

A critical review of understanding “integration” has also been provided by Smith, L, et al in their article. Three main perspectives of developmental, sociological, and managerial of integration have been suggested (4). Integration is a complex approach that requires a broad and in-depth understanding of multiple factors, situations, and influencing factors. It is the process that needs to consider other factors that influence politics, culture, social structures, and external influence from development partners. One of the famous integrations in Tanzania was on health information and data management systems. Fragmented and disintegrated information and data, posed a great risk within various subsections of the health sector, hence impeded the decision-makers and development partners from making informed decisions (5). Taking examples in other countries like Mali, integrating dengue into malaria programs showed some progress. However, their initiative seemed to happen at the level of individual research and research institutions only while leaving key strategic decision-making bodies within the government and politics out of touch. Their initiative of integrating malaria into dengue existed at the operational level without the political will of the government, hence lacked the necessary support for full integration (6)

Globally, the control of vector-borne diseases represents one of the greatest public health challenges of the 21st century. In response, the World Health Organization (WHO) introduced the Global Strategic Framework on Integrated Vector Management (IVM). The Framework was

intended to provide new and broad principles and approaches to vector control that can be applied to all vector-borne diseases (7)**.** Integration of vertical programs is an essential cost-effective strategy in increasing access and continuum to health care and that functional and organizational structures must have a global strategic framework for successful implementation of IVM (8, 9). Integration of programs is influenced by organizational factors like policy, guidelines, organizational structure, organizational infrastructure, human resources, financial resources, and stakeholders' support for the integration (10,11,12). By using an IVM approach WHO recommends programs to control malaria and lymphatic filariasis to coordinate and benefit from each program's activities, thus enhancing their overall impact on public health (13,14,15).

Despite the absence of specific therapy for dengue infections, nevertheless, initiatives have been aimed at vector control and prevention of mosquito bites (16). The mosquito that transmits dengue also transmits chikungunya, yellow fever, and Zika infection (17). In Tanzania, the country is implementing both the Neglected Tropic Diseases (NTD) Program and National Malaria Control Program (NMCP). However, Dengue is not part of these programs (10) despite WHO's recommendation for dengue to be included in the IVM (7). Currently, the IVM is implemented under the malaria vector control strategy in NMCP (18,19). Additionally, mosquitoes transmit both malaria and dengue and thus the main methods to control or prevent their transmission are similar. This poses and draws questions as to why Dengue control is not integrated into either of the two programs.

Tanzania has no strategic plan for dengue control interventions. Despite the absence of strategic plans/interventions for dengue in Tanzania, the government has put in place the interventions and protocols for the management of dengue cases. However, most of these interventions have been implemented in an ad-hoc manner due to inconsistent allocation of resources to address this disease. In Tanzania, NMCP is responsible for the development of Malaria strategic plans (20), developing guidelines, mobilizing resources from different partners, facilitating the implementation of various interventions and conducting monitoring and evaluation (M&E) on implementation of malaria control interventions (20). The NMCP is also responsible for implementation of Integrated Malaria Vector Control (IMVC) (21). Therefore, this study aimed at exploring organizational facilitators and barriers to the integration of dengue into the National Malaria Control Program (NMCP) in Tanzania.

Materials and methods

Study design

A cross-sectional exploratory case study design was used whereby a qualitative approach was applied to data collection and analysis of data related to the study objective. An exploratory case study is appropriate when studying "little understood real-life phenomena" where the researcher has no control over the behaviors and actions of the study population (32). We adopted a case study design in which we used key informant interviews (KII) for data collection. This design was used to acquire an in-depth understanding of the dengue interventions in Tanzania and how these interventions can be integrated into NMCP in the country. This study was conducted between July and August 2020.

Study context

The case study was undertaken within the National Malaria Control Program which is under the Directorate of Preventive Services (DPS) in the MoHCDGEC. The NMCP is responsible for designing malaria strategic plans, developing guidelines, mobilizing resources, and facilitating implementation, monitoring, and evaluation of malaria control interventions. Additionally, the NMCP has been implementing the integrated vector malaria control program which focuses on the consolidation and expansion of the indoor residual spraying (IRS) in epidemiological and operational suitable areas. The NMCP has also been implementing larviciding interventions in selected urban and rural areas where breeding sites are few, fixed, and findable. Moreover, NMCP promotes effective environmental management for malaria control amongst targeted communities. All of the above methods to control malaria seem to be more relevant in controlling dengue mosquitoes (21).

Study population

We conducted 15 interviews with key informants from the Directorate of Preventive Services at the MoHCDGEC (including members from the administration level, epidemiology department, and Monitoring and evaluation); NMCP (including members from the vector control unit, Administration level, case management unit, and Monitoring and evaluation unity) and NTD program**.**

Sampling strategy

We purposefully selected 15 key informants based on their understanding of methods of control of malaria and their experience on dengue, their roles in designing a malaria strategic plan,

developing guidelines, mobilizing resources, facilitating implementation, and M&E on malaria control interventions.

Data Collection

A total of 15 interviews were conducted (Table 1, Figure 2.1 – 2.3) with key informants from the Directorate of Preventive Services MoHCDGEC, NMCP, and NTD program. We attained information saturation at the fifteen interviews, and stopped data collection as we didn't aim to generalize the findings but to analyze the qualitative experience from the study objectives thereby, generating new knowledge. Each interview was conducted by the first author in the office of the informant and lasted between 35 and 45 minutes. Each interview was audio-recorded using a digital audio recorder, and during the interview a research assistant who accompanied the first researcher was charged with taking notes. All the audio-recorded interviews were transcribed through the use of the F4 programmer, and transcripts were then imported to Nvivo software (to avoid bias) for coding and sorting by the researcher. The data collection was executed by two people, the principal researcher and her assistant.

Table 1: Overall Characteristics of Interviewees

		Directorate of Preventive Services (MoHCDGEC), n=5	NMCP, n=7	NTD-program, n=3
Age	≤ 35	1	2	2
	≥ 36	4	5	1
Sex	Male	3	5	3
	Female	2	2	0
Work experience (duration)	2-3 years	1	0	0
	4-5 years	2	2	1
	6-7 years	2	2	0
	>10 years	0	3	2

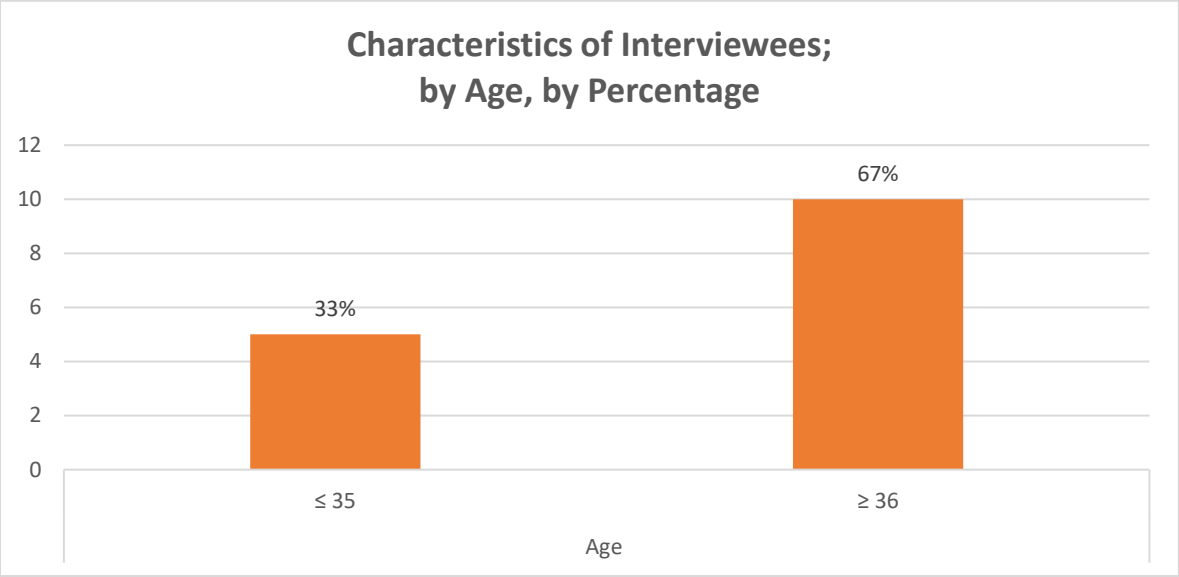

Figure 2.1. Characteristics of Interviewees by Age, by Percentage

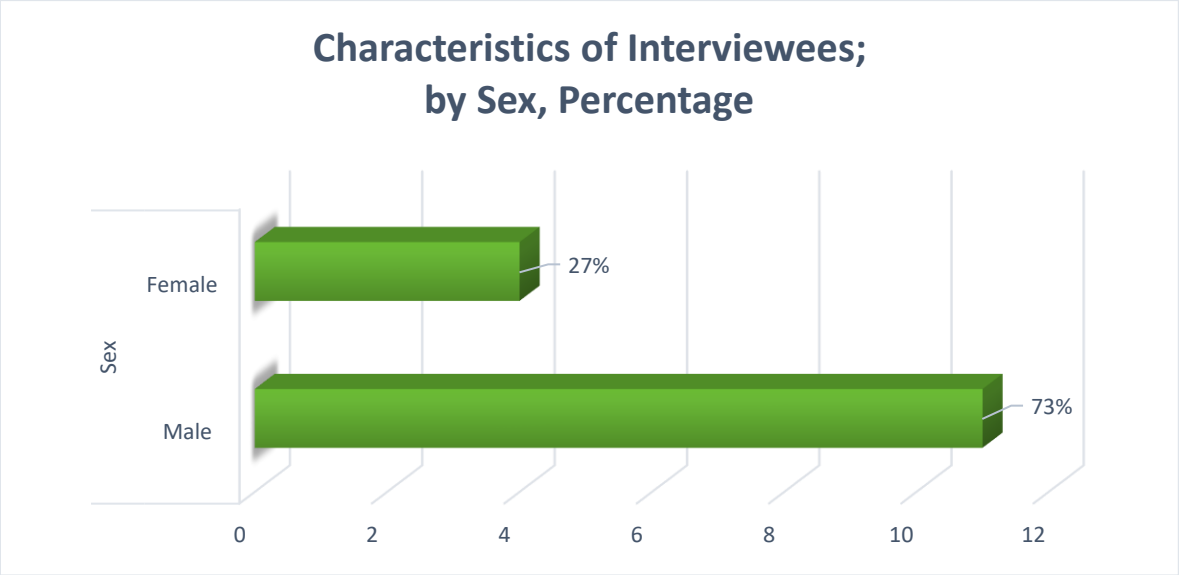

Figure 2.2. Characteristics of Interviewees, by Sex, by Percentage

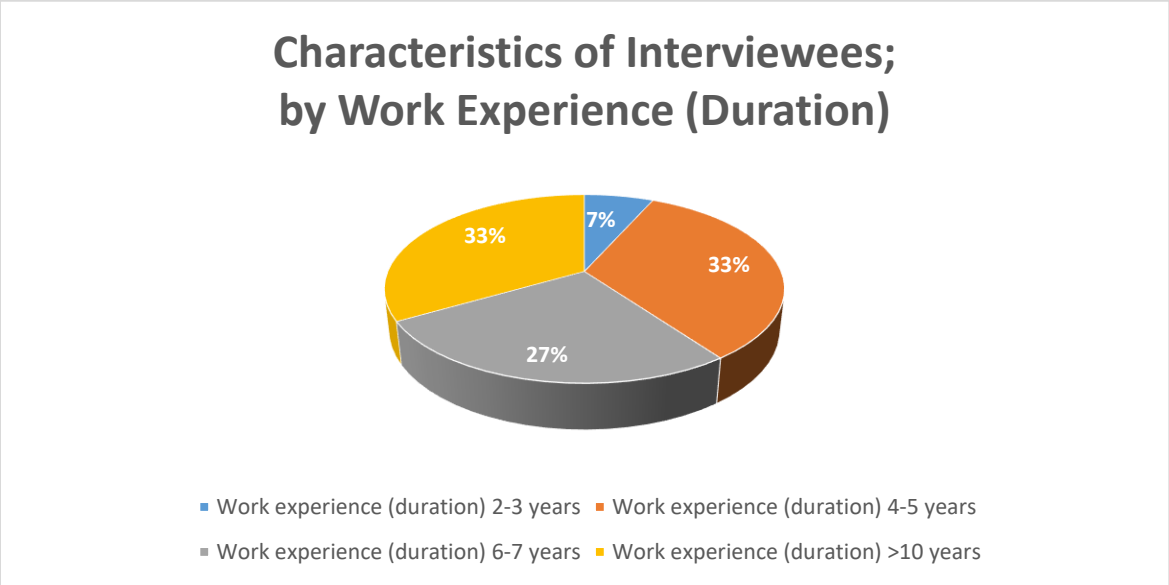

Figure 2.3. Characteristics of Interviewees; by Work Experience (Duration)

Data analysis

Audio-recorded and spoken notes were transcribed verbatim and then the themes and codes were translated from Kiswahili to English before analysis. An inductive thematic analysis was applied to identify themes, and the data that was important or interesting to the study objective, and use these themes to address the research or state something about the objective of the study. Using an inductive approach, the themes, codes, and categories were determined by the data collected, and all the audio-recorded interviews were transcribed through the use of the F4 programmer, and transcripts were then imported to Nvivo software for coding and sorting. The researcher and her assistant focused on a few key issues as analyzed in the form of themes. The transcribed data was analyzed through the categorization of the gathered information. The analysis was carried out in three stages suggested by Virginia Braun and Victoria Clarke (22) first, the line-by-line coding of field notes and transcripts; second, the in-depth examination and interpretation of the resultant codes and their categorization into descriptive and analytical themes; and third, the development of an overarching theme. The coding involved the development of concepts, i.e. the data was split into discrete elements to expose underlying thoughts and meanings. The generated codes were further interpreted and categorized into descriptive codes. These latter codes were further distilled into abstract analytical themes around the results to be presented.

Ethical Considerations

Ethical clearance was obtained from the Muhimbili University of Health and Allied Sciences (MUHAS), Research and Ethics Committee (REC) (reference number; IRB: MUHAS-REC-06-2020-284). Permission to conduct the study was granted by the Permanent Secretary, MoHCDGEC. Participants were informed about the objectives of the study and their participation was voluntary and in a comfortable place identified by participants themselves. Written consent form was obtained from each informant before commencing the interview. Confidentiality and anonymity was observed throughout the study where no participant with identified information was recorded. The information collected has been stored in a secure place with limited access by authorized personnel only and with no possibility of disclosure of identity.

Results

The study applied an inductive thematic analysis where by data collected determined the themes, codes, and categories. In order to avoid bias in the generation of themes, Nvivo software was used by the researcher in generating themes, codes, and categorization process. The inductive analysis unveiled two themes., first, the organizational facilitators for the integration, whereby the informants revealed the readiness of the available human resources to support integration, the existence of a defined organizational structure, the existence of policy and guidelines, the availability of funds for integration, and stakeholders' interest. Second, the organizational barriers to the integration of dengue control into NMCP were attributed to the perceived financial cost to support integration, varying donor interests, and perceived additional workloads. (Table 2).

Table 2: A summary of themes and sub-themes

Sub-themes	Themes
• *Readiness of the available human resources to support integration* • *The existence of a defined organizational structure* • *Existence of policy and guidelines* • *Availability of funds for integration* • *Stakeholders interest*	Organizational facilitators for the integration
• *Perceived financial cost* • *Perceived Varying donors' interests* • *Perceived additional workloads*	Organizational barriers to the integration

Organizational facilitators for the integration

Readiness of the available human resources to support integration

The findings from the study revealed that the integration of dengue control in NMCP is feasible and can be implemented. The same human resources in NMCP and at all levels of the health sector (regional and council) can be utilized for dengue interventions. The study has shown that staff were ready to implement the activities of integration, should the decision on integration be made.

> *"People have been empowered to do that job...the same people employed by the government and they are being paid salary by the government can do such task. The government can add such a task to them and they can do it, we don't need to deploy new employees….The director has a plan to use the same human resources from NMCP to strengthen a new vector control unit within the ministry….. and has directed all councils to have staff who supervise all programs concerning vectors such as identifying all types of mosquitoes and its quantity." (KII-2 DPS)*

The existence of a defined organizational structure

Regarding the existence of a defined organizational structure, the findings revealed that the NMCP has an existing and supportive organizational structure. This implies that, there is no need to change the structure because the same unit that is tasked with vector control for the prevention and control of malaria, can as well be tasked with dengue interventions. This argument is backed up by the event of April 2019 when dengue out broke in Tanzania. During the outbreak of dengue in April 2019, the same unit of malaria vector control was tasked to implement most of the interventions like residual spray and dengue education awareness. The unit intervened the outbreak although it was implemented in ad-hoc manner due to lack of specific resources and proactive plans. Similarly, the regional and district levels can have their focal persons for malaria and dengue being integrated under the district medical officers (DMOs) office to implement some activities like residual spray, environment cleanliness, health education awareness and amongst other measures.

> *"Malaria and Dengue are under DPS in the MoH office where we all deal with vectors …..There is no need to change the structure in the unit because we have already a unit of malaria vector control in NMCP which performs some of the activities dealing with vectors". (KII-10 NMCP)*

Existence of policy and guidelines

The existence of policy and guidelines forms an integral part and is pivotal for strategic intervention of programs like dengue in its integration with malaria programs. In view of this, the study findings revealed an impressive applause for the existence of the guidelines to control most of vectors where both dengue and malaria are within the guidelines and NMCP while using the same National Health Policy (2007). This implies, the existing national health policy is in line (in most cases) with the integration of dengue into malaria control programs. However, it was of the view to some of the informants that, there is a need to review some few of the existing NMCP guidelines in order to integrate dengue interventions.

> *"There is a guideline developed by MoH to control all vectors. There is also a guideline to control malaria, but I don't think it will change much. As for dengue, I think it is a matter of adding dengue control interventions to our target and guidelines as well as the NMCP master plan to indicate dengue. In that way the document will be revised for integration while the policy in the health sector will still be one." (KII-14 in NMCP)*.

Availability of funds for integration.

Funds are always at scarcity when it comes into implementation of programs. However, results of the study have shown that there is a potential alignment of some funds from NMCP into dengue interventions. Funds from NMCP can be used and aligned to control both dengue and malaria. This was evidenced by the previous experience during the outbreak of dengue in 2019 when the resources used for ad-hoc activities such as biolarvcide to control dengue came from NMCP. That was made possible due to the fact that, both diseases share similar methods of control. Nevertheless, in areas with no similarities within integration, there should be few additional resources which we believe will be incomparable to the establishment of the new dengue control program in Tanzania.

> *"No need for additional resources except for activities which are different from that of malaria, but with the addition of minimum resources compared with starting a new program. For example, as I told you, the same spray can be used but also the same vehicles can be used in control of dengue and malaria at the same time"….. the integration reduces the cost and enhances better use of resources in terms of finance and human resource." (KII-11 in NMCP)*

Stakeholders' interests

Regarding stakeholders' interest, participants of the study were of the view that stakeholders like policy makers, Scientists, politicians, and the government itself will be interested in the integration since dengue is of public interest. Their interest was more likely in the interventions that support the control of diseases where funding can be availed.

> *"…when the outbreak occurs, it becomes like ad-hoc. It has no strategic plan and most donors have no interest in diseases like dengue fever and this is a challenge. When the dengue outbreak occurred, the MoH mobilized its resources from various sources. So the integration will attract their interest…" (KII-10 in NMCP)*

Organizational barriers to the integration

Perceived financial cost

Perceived financial cost is one of the organizational barriers to dengue integration into NMCP in the country. These costs are perceived to have come from buying some equipment and for interventions that are not present in malaria. Moreover, additional funds may be required in deploying some human resources to assist in the integration of the dengue as well as costs for training human resources for specific areas that are not compatible with malaria vector control programs. It is worth noting that these costs will be minimal compared to the establishment of the new and separate control program.

> *"There will be some additional costs for interventions which are not present in malaria for example spraying medicine at homes that do not affect malaria. Adding more human resources, and training human resources, will need more funds. The only part we can use some funds which is within the intervention of larvicide and it is not supported by donors but by the government itself"***.** *(KII-9 in NMCP)*

Perceived Varying donor interests

The findings from the study indicated that some of the donors provide their funds to support the interventions in malaria as they seem to be more interested in the disease. Their interest focuses on the treatment, morbidity, and mortality of diseases such as malaria, Tuberculosis (TB), and human immune deficiency virus (HIV). Moreover, the donors' interest will unlikely be in the integration of dengue and malaria since they have their interests and targets for funding their interventions which may not directly linked to the control of dengue.

"to support something which is preventable, I think most of the donors have an interest in it…but some of the donors at NMCP do not agree with some of the interventions, we have donors like PMI and Global Fund….they can support mosquito net as part of malaria control but they cannot support something like larvicide which is used in dengue control." (KII-8 in DPS)

Perceived additional workload

Few of the informants in the study perceived that there would be a minimum additional workload for the program because the human resources for health are few. They are of the view that, some new interventions and objectives will be added to control dengue.

"Some of the tasks will lead to an increase in workload, especially the issue of monitoring. For instance, monitoring the characteristics of different mosquitoes…by looking at beting habits and beting rate if it can differ….nursery of mosquitoes by looking at mosquito repellent and how long it takes….therefore it will be two different tasks and hence the addition of some new workload". ***(****KII- 8 in NMCP)*

Discussion

We aimed to analyze the organizational facilitators and barriers that influence the integration of dengue control into the National Malaria Control Program. Our study has found that organizational facilitators that influence the integration are supported by the adequacy of human resources to support integration, the existence of a defined organizational structure, the existence of policy and guidelines, the availability of funds for integration, and Stakeholders' interest.

Nevertheless, we found there are also organizational barriers to the integration of dengue control into NMCP. These organizational barriers are perceived in different contexts ranging from; perceived additional cost to support integration**,** perceived varying donors' interests, and perceived additional workloads to integrate dengue into the NMCP in the country.

The integration of dengue control in NMCP is facilitated by many factors including the readiness of the available human resources and political will. The same available human resources who are working on controlling malaria interventions can support additional tasks once integration has been done. This integration is conceivable since there is adequate knowledge and skills to control vector diseases. Apart from that, the same human resources have been used in implementing the ad-hoc activities of controlling the recent outbreak of dengue (2019) in Tanzania.

Additionally, our study suggests that the existing human resources might need a refresher or on-the-job training based on dengue disease before and during the outbreak of dengue. To cement this integration, another study was conducted in Tanzania which documented the integration of Reproductive and Child Health services which deployed new human resources as well as used existing employees to implement the integrated program. Also, they integrated training courses for Reproductive, Maternal, newborn child, and Adolescent Health (RMNCAH) as well as appropriate pre-training courses in RMNCAH that addressed a holistic approach to treatment instead of treating a disease or condition alone enabling the integration of Reproductive and Child Health (14). Another study was conducted in the United States of America (USA) which explained and revealed how health workers and top management support the integration to be a significant aspect of the integration of management systems or health services in general (23).

Currently, the presence of policy and guidelines like Tanzania's national health policy (2007), and vector control guidelines can support the integration of dengue in NMCP. Different policies, strategies, and guidelines in Sub-Saharan Africa recognize integration as a way of ensuring the quality of care, efficiency, and patient satisfaction (24). In South Africa, policies at all levels since 1994 have supported moves toward integrating Primary Health Care services in various forms. In South Africa, integration is a health sector reform priority, while several vertical programs exist such as HIV, tuberculosis (TB), and maternal and child health (MCH) (25). The vector control guidelines should be used where both dengue and malaria are within the guidelines. However for NMCP guidelines, some review is needed for integrating some of the dengue interventions. Nevertheless, the study findings were contrary to the study conducted in Niger which reported the policy change which came in response to concerns. The policy called for the delivery of integrated management of acute malnutrition (IMAM) in all public health facilities. It allowed rapid geographical expansion and aimed at resolving access, quality, and coverage issues (26).

The study revealed that there is the availability of funds for the integration of dengue into NMCP, as WHO's key purpose of integrating vertical programs is to ensure good utilization of resources. Moreover, larviciding interventions in selected urban areas where breeding sites tend to promote effective environmental management for malaria control amongst targeted communities is recommended (21). Additionally, in other studies conducted in Ghana, Kenya, and Zambia, it was reported that both government and donor decision-makers had supported the international rhetoric on integration while being aware of the obstacles at the national level (27).

The study revealed the perception of additional burden for some of the costs, these include but are not limited to; funds for the purchase of some equipment, material, and supply, additional funds for interventions that are not present in malaria, additional funds for deploying some human resources to assist the integration of the dengue as well as the costs for trainings of human resources. They may be seen as a barrier to the integration because funds in NMCP are allocated only for malaria programs (5). However, this addition will be minimal compared to the establishment of a new dengue control program. In other places like Uganda, it was reported that finance resource-related barriers that the primary care providers (PCPs) face regarding integrating mental health services into primary health care (PHC) included inequities in funding, lack of employee benefits, lack of reimbursement for services, uncertainty about continued funding for community programs/services due to cuts in the budgets for mental health services, insufficient insurance coverage to meet the treatment option, high cost of hiring nursing and support staff (28).

The findings from our study revealed further that stakeholders like policymakers, scientists, politicians, and funders like the government itself can support and are interested in the integration since dengue is of a public interest. However, the findings of this study showed variation in donors' interest and support. Most of the donors seemed to have more interest in supporting NMCP than dengue control interventions. Lack of direct support from the donors and development partners to dengue interventions other than the Tanzania government funds may be seen as a barrier to the integration in NMCP. In other studies conducted in Ghana, Kenya, and Zambia reported that both government and donor decision-makers had supported the move on integration while being kept informed of the possible obstacles at the national level (27). Another study which was conducted in Tanzania, reported that development partners like PATH Tanzania contributed much to the integration of the program of HIV/TB (29). The study findings revealed that there will be minimal additional workload for the program because some new interventions and objectives will be added to control dengue which are not the same as in malaria. Some of these minimal workloads could include but are limited to; monitoring the characteristics of different mosquitoes, looking at betting habits and biting rates if they can differ, the nursery of mosquitoes by looking at mosquito repellent, and how long it takes.

However, the human resources in health sector is still a challenge in general, the human resource is not enough in all sectors within the health system. Nevertheless, additional work will be minimal

since dengue is an outbreak disease. For instance, in another study which was conducted in the USA, it was reported that overload of the present health care workers was one of the important factors to be taken into consideration during integration, for example, they mentioned that integration of family planning services, antenatal and delivery care areas were necessary for primary level health workers. This should be taken with care as it might overwork the present few workers leading to poor health quality (30).

Recommendations

Large-scale study; we are of the view that a large-scale study should be conducted to explore further on the knowledge for the integration of dengue into malaria programs. A large-scale study could widen the scope by including other stakeholders and partners like the Ministry of Finance and Planning (for budgetary planning), development partners who contribute largely on the funds for current programs and potential funders of the integrated programs including dengue, department of human resource for health (HRH), Treasury department in MoH who are the custodian of structures, selected Councils who are the implementers of the policies and guidelines, health facility workers, members of council health management team (CHMT), local and international non-governmental organizations, research academic institutions, and amongst others.

Potential impact of the findings on public health and practice; The MoHCDGEC through the directorate of preventive services and NMCP should consider the provision of adequate refresher training and skills development programs to their employees at all levels of the health systems. This should include the importance and advantage of the integration of dengue to reduce some perceptions of negative attitude toward integration.

Strategic stakeholders' engagement; The MoHCDGEC through the directorate of preventive services and NMCP should consider to conduct strategic national level stakeholders' consensus meetings together with other development partners who support financially the malaria interventions. The stakeholders' regular meetings could be used to mobilize the resources for the perceived financial cost to support the integration of dengue and malaria. This will facilitate the funders and other stakeholders to draw interest in dengue as well as raising awareness from different stakeholders on the dengue control program.

Opportunities/possibilities; the findings this study provides a benchmark and profound opportunity to expand and explore more on the subject matter. Further study could explore more and focus on why integration has not been possible despite recommendations by WHO and this

study. A wider scope of the study could provide a broader, comprehensive, and deep understanding and hence providing a better options for the integration.

Strengths; a large-scale study will be more representative and participatory of all key relevant stakeholders. This will strengthen and enrich the results and recommendations that will be provided. Additionally, a large-scale study will provide a space for "evidence-based" advocacy and campaign for the integration of dengue into malaria programs.

Limitations; the study was conducted within the health sector-related sections of DPS, NMCP and NTD while leaving other stakeholders. The design of the study (case study design) dictated to focus on specifics for in-depth understanding and knowledge. This posed a possibility of bias in the research. To mitigate this bias, the first researcher clearly explained to participants the importance and objectives of this study so that they understand and provide facts. Furthermore, the triangulation of informants had offset this risk. In conclusion, the results and findings of this study could be limited.

Timelines on the recommendations; as a matter of public health interest, these recommendations should be taken as soon as possible in order to avoid ad-hoc matters of addressing dengue disease. This is because the findings have shown that dengue has been treated in ad-hoc manner and that this should be improved while taking into account that plans must be in place before another breakout happens.

Conclusion

Taking into account the organizational facilitators and organizational barriers to dengue integration into NMCP, we are of the view that there is a necessity for integrating dengue into NMCP. While the organizational facilitators like readiness of the available human resources to support integration, the existence of a defined organizational structure, the existence of policy and guidelines, alignment of funds for integration, and stakeholder's interests; all provide indications of possibilities of integration, it is of paramount importance and public interest to ensure dengue is integrated.

We argue that integration of dengue into NMCP should be implemented in consideration of other factors (socio-political, structures, procedures, culture) that influence the process. "*we have tried to broaden the concept of 'integration' as applied in health interventions in developing countries to include not only integration of data and management procedures but also the integration of socio-political and cultural mindsets of community members, local health workers, government and donor communities"* (1). At the core of this argument dwells the political will of the government

and development partners to ensure the integration has to be convincing to yield the results it intends to.

While the integration of dengue into NMCP is necessary, the study recognizes some barriers to the integration of dengue control. These barriers could hinder its integration into NMCP if not carefully and adequately addressed in the course of the integration process. Therefore this now calls for a shared responsibility. To ensure the implementation of the shared responsibility, stakeholders from the ministries of Local government, Education, Public service management and Finance, and other non-state actors should come together to discuss how to support dengue integration.

Abbreviation;

CHMT	Council Health Management Team
DPS	Directorate of Preventive Services
HRH	Human Resource for Health
IVM	Integrated Vector Management
IMVC	Integrated Malaria Vector Control
IRS	Indoor Residual Spray
IMAM	Integrated Management of Acute Malnutrition
KII	Key Informant Interview
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MUHAS	Muhimbili University of Health and Allied Sciences
MoHSW	Ministry of Health and Social Welfare
MoH	Ministry of Health
M & E	Monitoring and Evaluation
NTD	Neglected Tropic Diseases
NMCP	National Malaria Control Program
PCP	Primary Care Provider
PHC	Primary Health Care
RMNCAH	Reproductive Maternal, Newborn child, and Adolescent Health
RCH	Reproductive and Child Health
WHO	World Health Organization

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Availability of data and materials

The data (interview transcripts and documents reviewed) are available from the corresponding author; however, sharing is strictly limited as it may breach the confidentiality of the informants and research ethics.

Authors' contributions

DDL conceived the study, participated in its design, collected the data, analyzed the data, and drafted the manuscript. NS and EN participated in the design, were the overall supervisor in the research; and they supported to draft the manuscript. DCVK, LS, SUBI, NAK, MS, and NM participated in the design, and analysis and supported to draft the manuscript and writing of the manuscript. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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