

Integration of the One Health approach into the work of the Global Fund to Fight AIDS, TB and Malaria

Input paper by the Germany Constituency as a contribution to strategy development¹

Executive Summary

World leaders at several high-level meetings have called for a multi-disciplinary “One Health” approach to improve Global Health Security and to fight future pandemics on the basis of lessons learned from the COVID-19 pandemic. As the Global Fund to Fight AIDS, Tuberculosis and Malaria - one of the key actors in the response to global pandemics – deliberates on a new strategy starting in 2023, it should in this context also identify elements of the One Health approach that can add value to its mission of fighting the three diseases and strengthening health systems more broadly. This paper explores the potential of specific elements and provides options for the integration of a One Health approach into the planning for the Global Fund’s next 2023+ Strategy.

The following technical level recommendations on how to add value to the work of the Global Fund through a One Health approach, in particular for activities to fight tuberculosis and malaria and to strengthen resilient systems for health have been identified²:

Tuberculosis

- Integrate scientific evidence about the existing reservoir of tuberculosis pathogens in the animal kingdom in the **technical guidance for countries**;
- Include **livestock owning communities**, particularly pastoralists, in consultations and grant design and as an at-risk target group in the “Tuberculosis Information Note”;
- Follow a multi-sectoral approach to “find the missing millions”³, and **leverage catalytic funding** that has already been set up for tuberculosis case detection for the One Health approach; and
- Deepen partnering with **the International Union against tuberculosis and lung diseases**, which has been at the forefront, together with WHO and the Tripartite⁴, of developing the “Roadmap for zoonotic tuberculosis”⁵.

Malaria

- Improve collaboration with agricultural sector to identify alternatives to pyrethroids and increase impact against **insecticides resistance**;
- Intensify collaboration with **Water, Sanitation and Hygiene (WASH)** institutions;
- Enhance **integrated vector control**;

¹ **Acknowledgement:** We thank Dr. Susanne Münstermann for leading the work on this study. Susanne Münstermann is an independent Animal Health Consultant and an expert in the field of One Health. She has worked among other things on projects for the World Health Organization (WHO), World Organization for Animal Health (OIE) and the Food and Agriculture Organisation (FAO). In this context, she contributed to the Tripartite Agreement between FAO, OIE and WHO which engages the three organizations on working together on zoonotic diseases and antimicrobial resistance.

² No specific points were identified for HIV/AIDS, but extending AMR activities in support of RSSH should also include HIV

³ See reference 21, page 7

⁴ WHO, FAO, OIE

⁵ See reference 22

- Collaborate with the **environmental /forest agencies** to tackle problem of malaria control in communities living near forests; and
- Add the aspects of **climate change, effects of deforestation and land-use change** as well as of zoonotic malaria and its specificities for vector control to the Modular Framework.

Resilient and Sustainable Systems for Health (RSSH)

- Design local health **laboratory facilities** for **human and animal disease** primary diagnostics and jointly organize sample collection and dispatch to remote laboratories;
- Foster collaboration between **human and animal health professionals** responsible for **disease surveillance**;
- Collaborate with the **wildlife and environmental sectors** to assist in the outreach to communities that are “at risk” of contracting novel diseases but also HIV, tuberculosis and malaria;
- Integrate already existing “**One health workers**” such as **Field Epidemiology and Laboratory Training Program (FELTP)/ V medics and veterinarians** in the disease-specific intervention packages; and
- **Integrate vector control** in collaboration with the **WASH institutions and environmental departments** to reduce overall prevalence of vector-borne diseases, to achieve a reduction of the burden on health systems.

Ways forward to integrate the One Health approach in Global Fund work

To put these recommendations into practice, three main channels have been identified in order to integrate such activities in the work of the Global Fund:

1. Identification of **entry points at the country level**, in countries that are advanced in the One Health agenda and already have One Health structures in place. These could be used to leverage existing “One Health Roadmaps” and “National AMR Action Plans” during country dialogue. Furthermore, additional target groups, currently not mentioned in the technical guidance documents, should be considered in in-country consultations, such as
 - Livestock owning communities, including pastoralists; and
 - Frontline workers of the environment and livestock sector, such as rangers, eco-guardians, paravets, extension officers or technical assistants.
2. Integration of One Health technical expertise in headquarter discussions on policy updates and guidance on the diseases and RSSH and reflecting a One Health approach in key guidance documents such as the **Modular Framework and Information Notes**.
3. Considering a “**Strategic Initiative**” under the “catalytic funding” mechanism to demonstrate for specific interventions the added value of working at the interfaces of human health with animal and environmental health.

The findings in this paper offer several entry-points that should be considered for the inclusion in the Global Fund’s work in order to **take a more holistic approach to disease control and thus contribute to strengthening national health systems and foster pandemic preparedness through specific investments against the three diseases**. The Annexes provide examples of such interventions in line with the One Health approach.

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1. Introduction and the case for change

A number of key reference points guide the process of orientation towards the One Health principles such as the renewed Tripartite Agreement between the WHO, FAO and OIE on One Health of 2018, the “Berlin Principles on One Health” calling for a “United effort to stop diseases threatening all life on Earth” which were supported by the World Health Summit in 2020, and by the “One Planet, One Health, One Future” Conference organized by the German Government and Wildlife Conservation Society in November 2020⁶. Building on this high-level guidance, this paper explores considerations and options for the integration of a One Health approach into the planning for the Global Fund’s next 2023+ Strategy.

The case for integration of elements of the One Health approach in the Global Fund’s work:

- i. the Global Fund to fight AIDS, Tuberculosis (TB) and Malaria is preparing its next Strategy 2023+ and it has been asked in the review of the current strategy to “support health systems to become more sustainable... by linking Global Fund’s efforts **to the efforts of others** ... and consider **new areas that may merit inclusion**...”;
- ii. **collaboration with the animal health sector in the fight against TB** would merit inclusion as this would embrace the aspects of animal reservoirs for zoonotic TB including antibiotic resistant strains of the *Mycobacterium (M.) tuberculosis* complex;
- iii. **collaboration with the environmental and animal health sector in the fight against malaria** would merit inclusion as this would address the impact of environmental factors such as climate change and deforestation on the vectors as well as the issue of zoonotic malaria parasites;
- iv. strengthening veterinary **diagnostic and epidemiological capacity**, particularly at the “frontline or last mile” level, in parallel to the same in the human health sector would merit inclusion in view of establishing complementarity and strengthening of primary health care delivery for people and their animals such as done in the “Field epidemiology and laboratory training program” for veterinarians and medics⁷;
- v. **communities that own livestock or work with wildlife** would merit deeper engagement as they are not only at risk of the three diseases, but also particularly vulnerable to emerging or reemerging other diseases at the wildlife-livestock-human interface;

⁶ World Health Summit 2020 declaration: [M8 Alliance Declaration World Health Summit 2020 01.pdf \(d1wjxwc5zmlmv4.cloudfront.net\)](https://www.who.int/news-room/feature-stories/2020/11/2020-world-health-summit-declaration); The Tripartite Commitment declaration, 2017: https://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Tripartite_2017.pdf

⁷ Supported by the US Center for Disease Control (CDC)

- vi. in this regard **community-led and civil society organizations** have been identified by the Strategy review to be valuable partners and collaboration with environmental/ wildlife / livestock NGOs which are deeply engaged with communities living at the interfaces would merit inclusion;

2. Integration of the One Health approach at the technical level

In line with the review findings to integrate other sectors to boost capacity and impact of the Global Fund's fight against HIV/AIDS, TB and malaria where a win-win situation can be anticipated, it is recommended to address specific elements at the technical level. The technical expertise input aims at including the One Health approach by proposing additional intervention packages to the Modular framework sections on TB, malaria and "resilient, sustainable systems for health" (RSSH) and by adding indicators of achievement that allow for multi-sectoral engagement. We did not find any specific points for HIV/AIDS but extending AMR activities in support of RSSH should also include HIV.

2.1. Tuberculosis

Tuberculosis not only harms people but is also widespread in domestic and wild animals. Especially, livestock owning communities, including pastoralists, are considered to be at high risk of HIV/TB/malaria among others due to insufficient food hygiene. **The entry points for the One Health approach to the Global Fund are strengthened collaboration with the veterinary sector and the inclusion of the livestock owning communities.**

The context

Tuberculosis has serious consequences for humans and a broad range of wild and domestic animal species. An exchange of multi-host pathogens between wild and domestic animals and humans and vice versa is well known⁸. A One Health approach is warranted in terms of epidemiological investigation, diagnosis with particular emphasis on differential diagnosis to exclude other pathogens, and molecular diagnosis to differentiate the members of the *M. tuberculosis* complex (MTBC), identification of resistant strains in humans and animals as well as exchange of epidemiological data between the different sectors⁹. Without considering the animal reservoir in the fight against TB, zoonotic TB in humans cannot be fully addressed.

AMR threatens the fight against TB and is of no less concern in zoonotic TB. *M. bovis* is naturally resistant to pyrazinamide, one of the first line TB treatments. Some isolates of zoonotic *M. bovis* have been found to be multi-drug resistant.

Integration into current workstreams

- **Scientific evidence** about the existing reservoir of TB pathogens in the animal kingdom is **not yet integrated in the technical guidance for countries**, i.e. the "Modular Framework handbook¹⁰" and the "Information Note on Tuberculosis¹¹". Multidisciplinary work particularly in the detection and differentiation of all forms of TB will lead to a more

⁸ See references 7, 11-16

⁹ Because zoonotic TB often manifests as intestinal TB rather than lung TB (EPTB), many human cases remain undiagnosed or misdiagnosed. Increased awareness of this fact could be important to correctly assess the disease burden and to detect and treat zoonotic TB in humans.

¹⁰ https://www.theglobalfund.org/media/4309/fundingmodel_modularframework_handbook_en.pdf

¹¹ https://www.theglobalfund.org/media/4762/core_tuberculosis_infonote_en.pdf

realistic assessment of the underestimated role of zoonotic TB and a more targeted control in affected populations.

- The **livestock owning communities**, particularly pastoralists, could be **included in consultations and grant design**. They have been clearly identified to be at high risk of contracting TB, while also being exposed to vector borne diseases such as malaria. They represent a large proportion of the rural people in sub-Saharan Africa, in many of the 30 countries with the highest TB burden¹². This is supported by the “Global Plan to end TB 2016 – 2020”, quoted in the “Information Note on Tuberculosis” which has identified “people at risk of zoonotic TB, like livestock owners, as neglected populations, deserving greater attention”¹³.
- In a **revision of the “Information Note on Tuberculosis”** livestock owners, pastoralists or other people in close contact with cattle (butchers, veterinarians, animal health workers) or wildlife should be identified as an “at risk” target groups, warranting multi-disciplinary work, particularly at frontline and diagnostic level.
- **A multi-sectoral approach, supported by surveys and operational research would also assist in “finding the missing millions”¹⁴**, part of which likely live amongst the livestock owning communities and suffer from undiagnosed zoonotic TB. Catalytic funding (Strategic Initiative and multi-country grants) have already been set up for the purpose of “finding the missing millions” and could be leveraged for the One Health approach. A positive impact on RSSH and reaching UHC¹⁵ is also to be expected from such activities.
- **Deepen partnering with the Union**¹⁶, which has been at the forefront, together with WHO and the Tripartite¹⁷, of developing the “Roadmap for zoonotic TB”¹⁸ in reaction to the G20 call in 2017 for using the One Health approach to stop AMR and to increase the fight against TB. This Roadmap confirms that “people in contact with livestock are key populations at risk”. In line with many other publications it points out the scientific facts on zoonotic **TB that are not considered in the current Global Fund documentation** and that could serve as entry points for collaboration with the animal health sector.

Annex A provides proposed topics to include a multi-disciplinary approach into the tuberculosis section of the Global Fund’s work.

2.2. Malaria

Malaria is transmitted by mosquitoes and belongs to the category of vector-borne disease (VBD) and vectors are influenced by climatic factors. **The entry points for the One Health approach to the Global Fund are environmental factors (mainly climate change and deforestation), AMR and wildlife health.**

The context

Members of the family *Culicidae* such as *Anopheles spp.*, transmitters of malaria pathogens, transmit other life threatening human and animal diseases such as Zika virus, Dengue virus,

¹² See reference 19

¹³ See references 20 and 21 (p. 56)

¹⁴ See reference 21, page 7

¹⁵ Universal Health Coverage

¹⁶ International Union against TB and lung diseases, “The Union”

¹⁷ WHO, FAO, OIE

¹⁸ See reference 22

Chikungunya virus, Venezuelan equine encephalitis, Equine Encephalitis, Yellow fever, Japanese encephalitis, Rift valley fever and West Nile fever. **Social, demographic and environmental factors have altered VBD pathogen transmission patterns**, particularly in the context of rapid urbanization with lack of fresh water and sanitation, but also through structural changes in agriculture (e.g. large rice fields), producing a conducive environment for mosquitoes, midges and other biting insects.

A lot has been learned in vector control of mosquitos for these other diseases, particularly for zoonotic diseases. The impact of climate change on the spread of the diseases has also been studied¹⁹.

Resistance in mosquitoes/ other vectors against insecticides such as against pyrethroids, used to impregnate bed nets is a common phenomenon also in the control of vectors in livestock and is an obvious link to multi-sectoral work. An increasing **role of wastewater and sewage** in the genesis of pathogen resistances has been described.

Zoonotic malaria occurs when people become infected with malaria parasite species that more commonly infect non-human primates. Pathogens able to cross the species barrier²⁰ have been found in monkeys in South East Asia (SEA). These parasites have long been mistaken for human malaria parasites²¹ and only the use of polymerase chain reaction (PCR) in laboratories to detect specific genetic material has confirmed zoonotic malaria in all countries of SEA and as most common cause of malaria across Malaysia and some regions of western Indonesia, and the only cause of malaria in Brunei and Singapore. A high proportion of human zoonotic malaria cases in Southeast Asia affect individuals living or working in close contact with forests. Surges in malaria incidence have been associated with deforestation and have made the intrinsic linkage with environmental protection particularly evident in Malaysian Borneo. A similar observation has been described in southern Brazil²².

Integration into current workstreams

- **AMR to insecticides and anti-malaria drugs** would benefit from a multidisciplinary approach, particularly regarding the identification of alternatives to pyrethroids, used to impregnate bed nets, and in the control of vector-borne diseases of livestock.
- Furthermore, the **collaboration with WASH²³ institutions** in countries with AMR issues regarding pyrethroids and anti-malaria drugs should be intensified to identify the role of wastewater and sewage for multiplication of vectors and development of AMR.
- **Integrated vector surveillance and control** is the link to other concurrently existing diseases, leading to an overall reduction of VBD pressure. This engagement would be in line with the “Global Vector Control Response 2017 – 2030” (23) in which **WHO strongly advocates for integrated vector control, involving environment and animal health sectors in a One Health approach**.
- The increasing occurrence of **zoonotic malaria** in SEA, often associated with communities living near forests, poses a unique problem for malaria control efforts. **Collaboration with the environmental /forest agencies is recommended** to tackle this particular but increasing problem in a multi-disciplinary approach.

¹⁹ See references 17, 18, 32

²⁰ Such as *Plasmodium knowlesi*, *P. cynomolgi*

²¹ Such as *P. malariae*, *P. falciparum* or *P. vivax*

²² See references 25-27

²³ Water, sanitation and hygiene

- It is recommended to **add the aspects of climate change, effects of deforestation and land-use change** as well as of zoonotic malaria and its specificities for vector control to the Modular Framework.

Annex B provides proposed topics to include a multi-disciplinary approach into the Malaria section of the Global Fund's work.

2.3. Resilient, sustainable systems for health (RSSH)

The adverse effects of emerging diseases with epidemic or even pandemic potential such as the current COVID-19 crisis will always affect disease centered programs such as the Global Fund and will threaten the gains made. It is therefore generally accepted that Global Health Security (GHS) has to be strengthened to enable countries to react quickly to new disease threats and to sustainably implement ongoing disease control programs at the same time²⁴. The primary health care system plays a critical role in this regard. The Global Fund responds to this need through its RSSH activities.

While the Global Fund is primarily a vertical program with disease focus on HIV/ AIDS, TB and malaria, it also contributes significantly to efforts to achieve "resilient, sustainable systems for health". In the last funding cycle, more than 25% of the budget focused on health systems strengthening intervention packages under eight different Modules in the Modular Framework. Some of these efforts, if carried out in a multi-disciplinary One Health approach could add value and increase impact (see Annex C). **The entry points for the One Health approach to the Global Fund are strengthened collaboration with the national One Health structures, capacity strengthening of laboratories and human resources and working with the wildlife / livestock communities.**

The context

Many countries face human and animal health resource deficits in communities far from population centers. In these settings, the health of the animals that share the same environment with their owners, are inextricably connected to the physical and mental health of the people. Yet, primary health service delivery often falls short for the people and their animals alike.

One Health approaches to provision of primary health care in conjunction with wildlife/environment conservation need to be specifically applied where livestock is an integral part of the economy, irrespective of livestock production systems (pastoralism, backyard, mixed farming, industrial livestock farming) and in countries with large areas covered by national parks / wildlife reservoirs and adjacent populations that exploit the resources in these areas through mining, hunting, fishing, tourism etc. These **examples should** be listed and **be brought to the attention of the Country Coordinating Mechanisms (CCMs)** when discussing support to RSSH²⁵.

The effective control of any infectious disease requires data, epidemiological expertise, and diagnostic/laboratory resources. **Building an integrated human and animal laboratory capacity** to conduct effective surveillance, adapted research, accurately diagnose disease, and analyze epidemiological data to develop countermeasures, are essential components of effective infectious disease control. This approach is adopted by the Redise²⁶ project in the ECOWAS

²⁴ Global Health Security Agenda, 2024 Framework, 2018, [*GHSA 2024 Framework \(ghsagenda.org\)](https://ghsa.org/)

²⁵ See references 28 and 29

²⁶ Regional Disease Surveillance Systems Enhancement

countries (World Bank) and the capacity building efforts of the CDC supported “Field Epidemiology and Laboratory Training Program” for medical doctors and veterinarians as “disease detectives”.

VBD such as malaria, but also others, affect disproportionately poorer populations that live without proper water and sanitation infrastructure and are therefore exposed to a higher risk of contracting VBD when in search of water. Coordinated, integrated and multi-sectoral approaches to vector control and sanitary infrastructure improvement will not only reduce the risk of exposure to malaria but also to other VBD diseases. VBD have overwhelmed national health systems and a multi-disease reduction through integrated vector control can lead to a reduction of this burden to the health systems.

Integration into current workstreams

- In regions with poor primary health coverage, **economies of scale could be achieved if local health laboratory facilities are designed to serve human and animal disease primary diagnostic** needs and if sample collection and dispatch to remote laboratories can be organized jointly.
- **Collaboration between health professionals (including para-professionals) responsible for human and animal health disease surveillance** for TB and malaria, vector- or AMR surveillance can also produce economic and health benefits for communities.
- **Collaboration with the wildlife and environmental sectors to assist in the reach-out to communities that are “at risk”** of contracting novel diseases but also HIV/TB/malaria and the provision of primary health care services should be sought and this integration and collaboration be encouraged during CCM discussions.
- **Integration of already existing “One health workers” such as FELTP/V medics and veterinarians in the disease-specific intervention packages and increased training** could enhance the capacity of the Global Fund to extend to the interfaces of disease specific interventions with the animal- and environmental health sectors, where appropriate.
- **Integrated vector control in collaboration with the WASH institutions and environmental departments**, academia and research institutions will not only impact on malaria, but will contribute to an overall reduction of VBD, leading to a reduction of the burden on health systems.

Annex C provides proposed topics to include a multi-disciplinary approach into the RSSH section of the Global Fund’s work.

3. Integration of the One Health approach at the country level

Many LMICs are working to embrace the One Health approach by establishing inter-ministerial One Health structures, formulating **national One Health Strategies** and engaging their academia and research institutions in global or regional One Health Networks²⁷. In a recent study, some 116 One Health networks were identified, of which 100 were analyzed and described as active. Some examples for national One Health structures are the “Zoonotic Disease Unit” in Kenya or the national One Health Platform in Tanzania, in Burkina Faso or Liberia or countries with a specific National One Health Strategy, such as Ethiopia and Nigeria²⁸.

²⁷ Khan et al. The growth and functioning of One Health networks, Lancet Planet Health 2018; 2: e264–73

²⁸ See references 4-9 in the list below.

In 2016, WHO approved the **Joint External Evaluation tool (JEE)** as a framework to assess country capacities to prevent, detect and rapidly respond to public health risks. Using this tool in a multi-disciplinary approach offers another source of information about the national health systems in the context of Global Health Security. Results from voluntary JEE evaluations are used by countries to refine their national action plans for health security.

Since 2013, the Tripartite (WHO, FAO, OIE) has supported a mechanism to establish One Health Roadmaps during **National Bridging Workshops**. In a multi-disciplinary and multi-sectorial Workshop, overlaps between the human and animal health sector are established and countries develop a detailed roadmap for One Health engagement. Such Roadmaps exist for 12 countries in Africa, 3 in Eastern Mediterranean, 9 in Eastern Europe, 2 in the Americas and 5 in South East Asia, providing a perfect match with the countries eligible for Global Fund grants.

Common themes in these **One Health Roadmaps** are (i) Antimicrobial resistance (**AMR**) (ii) **zoonotic diseases**: joint surveillance, joint laboratory capacity, joint dispatch of samples, multi-sectoral simulation exercises; (iii) **laboratory**: joint laboratory equipment/consumables procurement, joint training on zoonotic disease diagnosis, building of a multi-sectoral lab network, (iv) sharing of epidemiological data between the sectors.

One of the most pressing challenges to global health security and a key topic for the One Health agenda is antimicrobial resistance (AMR). **National AMR action plans** have been developed by many LMICs which presents a solid One Health basis for addressing this important health security topic at national level in a multi-sectoral approach.

Countries eligible to apply for Global Fund grants should be encouraged to embrace these national One Health structures where they exist and the relevant Government agencies, NGOs, academia and private sector that support them to create synergies and value addition. They could also use the information available from National Bridging Workshops and JEEs and consider AMR national action plans during the in-country dialogue coordinated by the CCM when preparing their grant applications.

Furthermore, additional target groups, currently not mentioned in the technical guidance documents, should be considered in the in-country consultations, such as

- **Livestock owning communities, including pastoralists.** They play a very important role in agriculture-based societies, and they are prone to suffer from all three diseases, with a particular risk for vector borne diseases, such as malaria and from zoonotic TB. Milk for example is frequently an important or the primary food of pastoralists, and in particular of women and children. Lack of infrastructure and lack of awareness of the significance for milk pasteurization, meat inspection and preparation of food contributes to the TB burden among this community. They usually also don't benefit from health care systems due to structural barriers. They have associations or other forms of representations. The CCMs should be encouraged to include this target group into their consultations.
- **Frontline workers of the environment and livestock sector**, such as rangers, eco-guards, paravets, extension officers or technical assistants who work very closely with the rural communities and help to cover "the last mile". Their participation in community work to strengthen basic health delivery systems could be of great value, as livestock owners value their services highly as they attach a lot of social value to their animals.

Some donors to the Global Fund have instruments and expertise available to support this inclusion of One Health structures and information in the in-country consultative process. These bilateral technical assistance (TA) structures should be leveraged for this purpose.

4. Conclusion and ways to integrate the One Health approach in Global Fund work

The findings in this paper offer several entry-points that should be considered for the inclusion in the Global Fund's work in order to take a more holistic approach to disease control and thus contribute to strengthening national health systems and foster pandemic preparedness through specific investments against the three diseases. The Annexes provide examples of such interventions in line with the One Health approach.

In this paper we are providing concrete proposals for integration of the One Health approach at RSSH, disease specific and target group levels that in our view could add value to the work of the Global Fund. To implement the proposals, we see three channels to do so:

- **To advocate the One Health approach at country level we are proposing to identify countries that are advanced in the One Health agenda (e.g. Nigeria, Kenya) and that have a national interest to apply it.** Supportive work with the CCMs and the engagement in the in-country consultative process should be strengthened e.g. through technical assistance (TA) as described in chapter 2. Through the inclusion of national practicing One Health staff/structures/projects, the One Health approach could be integrated into the grant design.
- In parallel, at Global Fund Headquarter level, **One Health technical expertise should be integrated in technical discussion on the diseases and RSSH as describes in chapter 1.** Through this engagement the One Health approach could be included in the next release of key technical guidance documents for the period 2023 – 2025 such as the **Modular Framework**, Technical briefs and Information notes where appropriate and where adding value, and concrete activities with related indicators for inter-disciplinary engagement could be suggested. Some examples are shown in the Annexes.
- If countries are amenable to embrace the suggested One Health approach and if guidance documents include relevant technical references, a **“Strategic Initiative”** under the “catalytic funding” mechanism as a pilot to demonstrate for specific interventions the added value of working at the interfaces of human health with animal and environmental health could be envisaged.

Annexes

Annex A: Tuberculosis

Proposals for topics to be addressed in multi-disciplinary approach of human- and veterinary sectors in the fight against **tuberculosis**

| Area of intervention | Proposed interventions | Indicator of achievement | Contributing partners |
|----------------------|--|---|---|
| TB surveillance | Where it is known that TB prevalence in animals is high, engage Veterinary sector to increase surveillance efforts of livestock and wildlife and establish prevalence of <i>M.bovis</i> and other zoonotic mycobacteria | Improved knowledge of TB prevalence in domestic and wild animals in selected areas | <ul style="list-style-type: none"> • Research partners • Veterinary Services • Veterinary Laboratories |
| TB diagnosis | Submit human TB surveillance samples to PCR or other molecular diagnostic tests to differentiate agents of the MTBC in countries with known occurrence of <i>M. bovis</i> in cattle or other animals; Establish percentage of zoonotic TB in human TB prevalence | Epidemiological relation between human TB and animal TB established for selected areas | <ul style="list-style-type: none"> • Human TB laboratories • Ministry of Health • Decentralized health centers • Zoonotic TB experts (e.g. German Federal Institutes) |
| TB control | Veterinary Services to reduce TB prevalence in cattle through control programs with their own funding Include data exchange with Ministry of Health to find out impact on human TB prevalence Improve food safety, veterinary public health | National bovine TB control program established Epidemiological data of livestock and wildlife data exchanged with Ministry of Health | <ul style="list-style-type: none"> • Veterinary Services • Tripartite/The Union coalition Roadmap on zoonotic TB • Ministry of Health |
| Community engagement | Include livestock owning communities in Global Fund's TB prophylaxis and control | Livestock owning communities have been singled out as "high risk" communities and are engaged in a multi-disciplinary approach | <ul style="list-style-type: none"> • NGOs engaged in community work • Animal health assistants/Community animal health workers |

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|-------------------|---|---|--|
| TB treatment | Consider single or multiple drug resistance (of <i>M. bovis</i> and MTBC), particularly when treating livestock owning people | Treatment based on molecular identification of agent in people that live with or work with livestock/wildlife | <ul style="list-style-type: none"> • AMR working groups in WHO, OIE, FAO • Ministry of Health |
| Capacity building | Train animal health assistants and community health workers together on zoonotic TB | Field level based joint training programs | <ul style="list-style-type: none"> • NGOs such as VSF int.; Deutsche Lepra and TB Hilfe |
| TB communication | <p>Highlight that zoonotic TB is a food-borne disease and can be controlled to a large extent by boiling milk, cooking meat and applying hygiene</p> <p>Highlight the role of wildlife as TB reservoir – avoid contact, consumption of wildlife products only when boiled</p> | Communication material for communities prepared in a multi-disciplinary approach | <ul style="list-style-type: none"> • Communication depts. of Ministry of Health (MoH) and Ministry of Agriculture (MoA) • One Health platform in-country structures • Collaboration with Tripartite • Tripartite/The Union coalition |

Annex B: Malaria

Proposals for topics to be addressed in multi-disciplinary approach of human- and veterinary sectors in the fight against **malaria**

| Area of intervention | Proposed interventions | Indicator of achievement | Contributing partners |
|--|---|--|---|
| Malaria vector surveillance/ Vector control | Surveillance for all members of the family Culicidae in view of identifying and quantifying vectoral capacity for malaria and other VBD | Improved knowledge of vector species and distribution in malaria prone areas | <ul style="list-style-type: none"> • Ministry of Environment (MoE) • MoH • Farmers, communities • Research partners (e.g. KCCR/BNI²⁹ in Ghana) |

²⁹ Kumasi Centre for Collaborative Research together with Bernard-Nocht-Institute

| | | | |
|--|---|---|--|
| Epidemiology/ Case management | Exchange of data of malaria and other VBD prevalence, including zoonotic VBD data between human- and veterinary sector; Epidemiological modelling on interdependence of malaria with other VBD, particularly those of zoonotic importance Effect of land use changes on vectors/ disease emergence | Data sets, including maps and models, on VBD, including zoonotic VBD, exchanged between the sectors | <ul style="list-style-type: none"> • Trainees in the FETLP with an interdisciplinary approach • MoH, MoE, MoA • Epidemiologists, entomologists, environmentalists • International experts (e.g. KCCR/BNI; FLI) • WCS, WWF |
| Diagnosis/ Case management | Molecular testing to differentiate from zoonotic malaria in SEA | Increase in molecular tests of malaria parasites in SEA for species differentiation | <ul style="list-style-type: none"> • National and international laboratories |
| Malaria vector control/ Vector control | Reduction of human vector contact through integrated approaches such as reduction on and around livestock Reduction of vector breeding sites Improvement of sanitary infrastructure Improvement of wastewater management Improvement of waste management | National integrated vector control plans available | <ul style="list-style-type: none"> • WASH departments • MoH, MoA, MoE • Urban planning • Entomologists, environmentalists • International experts |
| Resistance to antimicrobial substances and insecticides/ Specific | Integration of research into resistance to pyrethroids often used for parasite control in livestock and treatment of bed nets | Publication of joint research papers | <ul style="list-style-type: none"> • Tripartite Secretariat for AMR at WHO • GARDP³⁰ • IPPC • EPPO |

³⁰ Global Antibiotic Research and Development Partnership

| | | | |
|--------------------------|--|--|--|
| preventive interventions | | | |
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Annex C: RSSH

Proposals for topics to be addressed in multi-disciplinary approach of human-, veterinary- and environmental sectors in the support of RSSH

| Area of intervention | Proposed interventions | Indicator of achievement | Contributing partners |
|--|--|--|--|
| Support to field laboratories/ Laboratory systems; Community systems strengthening | Equip primary health laboratories with basic facilities for animal health diagnostics; train lab personnel accordingly | Livestock owning communities are better served | <ul style="list-style-type: none"> • MoE, MoA • Nat. One Health structures • WWF, WCS, VSF • FAO laboratory networks |
| Support to central laboratories/ Laboratory systems | Strengthen capacity of central labs or laboratory networks to diagnose AMR, particularly for HIV, TB and malaria treatments; support data sharing on AMR for the three diseases with the international AMR research networks | Improved understanding of AMR development in the three diseases across all Global Fund supported countries | <ul style="list-style-type: none"> • MoH, MoA • Tripartite Secretariat on AMR at WHO • GLASS³¹ • OIE AMR database |
| Capacity development at frontline level/ Human resources, including | Multi-disciplinary education of frontline workers through existing programs such as FELTP/V and frontline FELTP/V; multi-disciplinary capacity building for Community workers (CAHW; CAW) to assist in disease search at the last mile | Frontline staff are capable to recognize and report serious human and animal diseases | <ul style="list-style-type: none"> • MoH, MoA • VSF int. • WWF, WCS • Associations of para-professionals (human and animal health) • Nat. One Health structures |

³¹ Global Antimicrobial Resistance Surveillance System

| | | | |
|--|--|---|---|
| Community health workers | | | |
| Data exchange/ Health management information systems and M&E | Enhance laboratory and surveillance data exchange between MoH and MoA where appropriate, e.g. zoonotic TB and malaria; exchange data on HR with a multi-disciplinary training background | Increased awareness and knowledge about prevalence of zoonotic TB and malaria; Increased utilization of multi-disciplinary HR in the field | <ul style="list-style-type: none"> • MoH, MoA, IT departments • Nat. One Health structures |
| Work with the communities/ Community system strengthening | <ol style="list-style-type: none"> 1. Work with “at risk” communities that live and work with wildlife (tourist guides, eco-guides, hunters, scouts) 2. Work with “at risk” communities living and working with livestock (herders, pastoralists, veterinarians, butchers, slaughterhouse personnel) <p>to provide them primary health care through better coordination and multi-disciplinary approach to surveillance, diagnosis and treatment</p> | Improved primary health services to special “at risk” groups working with domestic and wild animals | <ul style="list-style-type: none"> • MoA – Wildlife Dept. • MoH • MoE – Forest Dept. • WWF, WCS • VSF int. • NGOs • Nat. One Health structures |
| Sanitary infrastructure/ N/A | Collaboration with WAHS institutions to improve urban and rural sanitary infrastructure to contribute to reduction of vector burden and improvement of hygienic standards | Reduction of vector burden, particularly of malaria mosquitos | <ul style="list-style-type: none"> • MoE • WASH institutions • Nat. One Health structures |

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