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# Prospective Country Evaluation

## Senegal

Annual Report 2019 - 2020

Commissioned by the Technical Evaluation Reference Group (TERG) of the  
Global Fund



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## Abbreviations and acronyms

AFM	Administrative and Financial Manager
ANC	Antenatal care
ANCS	Alliance Nationale des Communautés pour la Santé
ARV	Antiretroviral
CCM	Country Coordinating Mechanism
CNLS	Conseil National de Lutte contre le Sida
CRS	Catholic Relief Services
CSW	Commercial sex worker
CT	Country Team
DAGE	Direction de l'Administration générale et de l'Équipement
DHIS2	District Health Information Software
DHS	Demographic and Health Survey
DLSI	Division de la Lutte contre le Sida et les IST
DPM	Direction de la Pharmacie et du Médicament
DPRS	Direction de la Planification, de la Recherche et des Statistiques
DSSIS	Division du Système d'Information Sanitaire et Sociale
HSS+	Health System Strengthening
IDU	Injectable drug users
IHME	Institute for Health Metrics and Evaluation
IsDB	Islamic Development Bank
KII	Key Informant Interview
LFA	Local Fund Agent
LLIN	Long-lasting insecticidal net
MDR-TB	Multidrug-resistant tuberculosis
MOU	Memorandum of Understanding
MSAS	Ministère de la Santé et de l'Action Sociale
MSM	Men who have sex with men
NFM1	New Funding Model 1
NFM2	New Funding Model 2
NFM3	New Funding Model 3
NGO	Nongovernmental organizations
NHIS	National Health Information System
NSP	National Strategic Plan
OMVS	Organisation pour la mise en valeur du fleuve Sénégal
PCE	Prospective Country Evaluation
PEC	(Case) management
PEDACOM	Home-based management
PLHIV	People living with HIV
PMI	President's Malaria Initiative
PMTCT	Prevention of mother-to-child transmission of HIV
PNA	Pharmacie Nationale d'Approvisionnement
PNLP	Programme National de Lutte contre le Paludisme
PNT	Programme de Lutte contre la Tuberculose
PR	Principal Recipient
PRA	Pharmacies Régionales d'Approvisionnement
PU/DR	Progress Update and Disbursement Request
PWID	People who inject drugs
RCA	Root Causes Analysis
RSSH	Resilient & Sustainable Systems for Health
SR	Sub-Recipient
STI	Sexually Transmitted Infections
SW	Sex Worker
TERG	Technical Evaluation Reference Group
UCAD	Université Cheikh Anta Diop
UNICEF	United Nations Children's Fund
USAID	US Agency for International Development
WHO	World Health Organization

## Executive Summary

The Prospective Country Evaluation (PCE) is an independent evaluation commissioned by the Global Fund's Technical Evaluation Reference Group (TERG). The purpose of the PCE is to help identify factors that limit or support the implementation of Global Fund grants in order to offer strategies to improve program performance. In 2019, the PCE in Senegal explored a range of research questions on tuberculosis (TB), malaria, HIV and on strengthening resilient and sustainable systems for health (RSSH).

The PCE used process evaluation methodologies based on several primary data sources, including: (1) key informant interviews (KIIs), (2) non-participant meeting observation at the technical committee meetings of the Ministère de la Santé et de l'Action Sociale (MSAS) and (3) document review. This data has been triangulated with secondary quantitative analyses, using data from national programs, DHIS2 (District Health Information Software) and Demographic and Health Survey (DHS). Funding sources were reviewed to track the budgets, spending and absorption rates of different intervention programs. This holistic approach has led to a diversification of information sources, supporting data triangulation. Furthermore, a root cause analysis was conducted to better understand the factors at play in grant implementation.

Overall, all programs experienced delays in launching their New Funding Model 2 (NFM2) activities. The reasons for these delays vary by program, but they are mostly due to systemic issues. For example, long procurement procedures were identified as the primary reason for the delay in implementing the anti-malarial mass campaign for the general distribution of long-lasting insecticidal nets (LLIN). Delays in providing supporting documentation for disbursements, primarily due to a lack of proficiency in Global Fund procedures by the new Principal Recipient, negatively impacted TB/RSSH grant implementation. With regard to HIV, the withdrawal of a sub-recipient (SR) led to the end in the management of activities for men who have sex with men (MSM) in the southern zone. Finally, it is worth noting that the lack of implementation of health system strengthening activities, primarily the strengthening the National Health Information System (NHIS), has led to an absence of DHIS2 training activities. Additionally, programs continue to use parallel data collection systems to the detriment of DHIS2 sustainability.

Despite these difficulties observed in program grant implementation, 2019 was marked by various activity rollouts with steadily increasing coverage levels for certain programs. The LLIN mass campaign was jointly implemented with The Gambia in order to extend coverage to the whole country before the onset of the high-risk period for malaria transmission, and household LLIN coverage reached high levels. HIV indicators for the most part saw progress in serostatus awareness and initiating ARV treatment. Nevertheless, disparities exist as women have better ARV treatment coverage than men, and there is limited testing, treatment, and viral load equipment in certain parts of the country. Additionally, viral load suppression indicators have not changed significantly with the exception of children. Low levels of viral load testing is tied to several factors, including lack of devices and inputs for viral load testing and procedural issues. Tuberculosis case detection did not see significant change at the country level, but geographic disparities persist with certain areas more affected than others. Tuberculosis presents a gender-based distribution with higher rates among men, a dimension that is currently being addressed through targeted tuberculosis interventions. The detection of multidrug-resistant tuberculosis (MDR-TB) has improved, but weak detection is noted in the southeast region of Senegal. This situation could be related to a low availability of GeneXpert machines.

## Key findings

*Table 1: Overview of key findings by topic*

Topic	Findings
Malaria	<p><b>Finding 1:</b> Despite the delay in launching the 2019 LLIN mass campaign, the PNLIP successfully completed the mass campaign before the onset of Senegal’s malaria transmission season, but this would not have been possible without the strong support of the Global Fund CT and a very original approach of both matching funds (IsDB) and partner cooperation (PMI, World Health Organization (WHO), Global Fund, etc.).</p> <p><b>Finding 2:</b> The distribution of LLINs in border zones between The Gambia and Senegal greatly considered the public’s preference in terms of mosquito nets to increase use. Nevertheless, the variability of LLINs distributed among other localities in Senegal could influence mosquito net use; coverage and use surveys are necessary within the context of post-distribution monitoring.</p> <p><b>Finding 3:</b> The organization of a joint campaign between The Gambia and Senegal, in addition to helping to accelerate the LLIN mass campaign implementation process, led to improvements in mosquito-net coverage indicators for Senegal. This intervention model could serve as a basis for the development of cross-border malaria elimination initiatives.</p>
Tuberculosis	<p><b>Finding 4:</b> Despite Global Fund investments in tuberculosis, the number of confirmed TB cases remained relatively unchanged while disparities by gender, age and geography suggest potential inequalities in anti-tuberculosis care services, yet are difficult to ascertain in the absence of supplementary prevalence data.</p> <p><b>Finding 5:</b> The number of detected MDR-TB cases has likely increased between 2015 and 2018 due to increased coverage, the use of GeneXpert machines and improved treatment availability. Nevertheless, efforts to strengthen TB and MDR-TB case detection have been blocked by an inability to acquire additional GeneXpert machines.</p> <p><b>Finding 6:</b> Despite commitments made during the grant allocation period, the government will not be ready to finance second-line treatments against multidrug-resistant tuberculosis by 2020.</p>
HIV	<p><b>Finding 7:</b> The proportion of people living with HIV (PLHIV) who have had their viral loads measured remains low despite investments to extend machine availability, because training service providers on machine use, input gaps and supply chain procedures remain challenging.</p> <p><b>Finding 8:</b> Viral load suppression is low among children and men. Socioeconomic difficulties and the need for routine assessments increase the inaccessibility of health facilities, particularly among vulnerable populations.</p> <p><b>Finding 9:</b> Catalytic funds accelerated interventions targeting key populations. In the third trimester of 2018, mobile clinics started offering antiretroviral treatment. Despite these efforts, legal barriers tied to sociocultural backgrounds persist.</p> <p><b>Finding 10:</b> There is a belief among stakeholders that the reduction in funds allocated to HIV control between the NFM1 and the NFM2 has particularly impacted prevention activities and program management. This situation was however, mitigated by catalytic funds.</p>
RSSH/DHIS2	<p><b>Finding 11:</b> Despite improved completeness and timeliness of DHIS2 data, programs continued to collect routine data in parallel, which puts the sustainability of the health information system at risk.</p>

## **Chapter 1. Introduction**

### **1.1 General overview of the 2019 Senegal PCE**

The Prospective Country Evaluation (PCE) is an independent evaluation commissioned by the Global Fund's Technical Evaluation Reference Group (TERG). Using a mixed-methods approach, the PCE aims to evaluate how Global Fund policies and processes play out in country in real time and aims to provide high quality, actionable and timely information to national program implementers and Global Fund policymakers. The PCE consists of a consortium led by the Institute for Health Metrics and Evaluation (IHME) and PATH, in partnership with the Institut de Santé et Développement (ISED) at the Université Cheikh Anta Diop (UCAD), and the PATH country office in Senegal (PATH/Senegal), who coordinate the PCE in Senegal.

During the first year, the PCE analyzed the funding request and grant making process and subsequent implementation of grants in 2018. The results presented in the 2018 annual report highlighted difficulties faced by national programs during this process, but especially the challenges associated with simultaneous grant closure and start up activities, as well as delays in resource availability, Principal Recipient (PR)/ sub recipient (SR) contracts, and the resulting absorption challenges. This report looks at grant implementation progress during 2019. The findings presented in this report emphasize the difficulties encountered during grant implementation and the effect of interventions on national program performance.

In 2019, based on guidance from the Global Fund TERG, there was a targeted evolution in PCE methods to focus on select topic areas with a greater depth of data collection through “deep dives.” The process began with the selection of research questions through an inclusive process with participation from the Ministère de la Santé et de l'Action Sociale (MSAS), national programs, the Country Coordinating Mechanism (CCM), and other key stakeholders. The PCE worked with stakeholders to identify priority topic areas based on several key criteria:

- The topic is a critical component of the results chain being affected by Global Fund investments;
- The information will contribute substantially to understanding of the Global Fund business model and to improvements in programming related to the Global Fund strategy;
- The issue is important for country stakeholders and the Global Fund Country Team (CT); and
- Data on the issue are available and evaluable.

During the May 2019 PCE results dissemination workshop, one topic per disease was identified for deeper analysis. This process and the choice of research questions were validated by the TERG and the CT.

### **1.2 Evaluation questions answered in this report**

#### **General questions on grant implementations in 2019:**

- How did the grant implementation process advance in 2019 and how did the grants perform?
- What are the facilitators and barriers to grant implementation?
- What was the impact of changes made to grant implementation arrangements?

#### **Evaluation questions for malaria:**

- What facilitators and barriers were encountered in the 2019 LLIN mass campaign (mass campaign) and what were the results?
- What was the added value from the joint campaign with The Gambia and what lessons were learned?



### Evaluation questions for tuberculosis:

- How did Global Fund investments help improve tuberculosis case management and treatment coverage, especially tuberculosis notification and MDR-TB case management?
- How were geographic and gender disparities in disease burden for tuberculosis considered when targeting and planning interventions?
- To what degree is the government prepared to fund second-line drugs by 2020?
- What are the facilitators and barriers to sustainability, transition and co-financing?

### Evaluation questions for HIV:

- How did Global Fund investments help improve HIV testing and treatment coverage, and viral load suppression?
- Do catalytic funds help remove human rights-related barriers to HIV services and how?

### Evaluation questions for RSSH/data systems:

- How did Global Fund investments help improve data quality in DHIS2 with regard to completeness, timeliness and accuracy?
- What are the facilitators and barriers to DHIS2 integration and use by country programs for better decision-making around program implementation?

## 1.3 Approach and methodology

Several quantitative and qualitative methods for data collection were utilized by the evaluation, including meeting observations at CCM and MSAS technical committee meetings, key informant interviews with program managers, civil society representatives and all stakeholders, including Global Fund country representatives, and document review (Table 2). This holistic approach has led to the collection of diverse information sources and thus supported triangulation during analysis. Document review and meeting observations have been under way since early 2019. After having identified the 2019 deep dive areas and evaluation questions, interviews were conducted with key informants between June and November 2019. Routine program data, gathered within the context of program implementation or ongoing surveys, were analyzed and triangulated with other data sources. Particular emphasis was placed on DHIS2 data.

*Table 2: Data source*

Data source	#	Description
<b>Meeting observation</b> January-November 2019	<b>30</b>	<ul style="list-style-type: none"><li>• Weekly TB/RSSH coordination meetings</li><li>• Biannual RSSH platform meetings</li><li>• Semi-annual CCM meetings</li></ul>
<b>Document review</b> April-November 2019	<b>45</b>	<ul style="list-style-type: none"><li>• Grant contracts and supporting documentation</li><li>• Letters from Global Fund leadership to PRs</li><li>• Grant confirmation letter</li><li>• National strategic plans</li><li>• PU/DR 2018, 2019</li></ul>
<b>Interviews with key informants</b> June-November 2019	<b>28</b>	Dakar (25): TB PR (MSAS, DSG/DAGE), TB SRs (Programme de Lutte contre la Tuberculose (PNT), International Plan, AFM), HIV PR (CNLS, ANCS), HIV SRs (DLSI), Malaria PR (PNLP), Pharmacie Nationale d'Approvisionnement, CCM, DSIS, Technical partners (PMI) Global (3): Global Fund CT
<b>DHIS2</b> 2014-2018	<b>N/A</b>	<ul style="list-style-type: none"><li>• Reported data on tuberculosis diagnosis, treatment, retreatment and treatment failure.</li></ul>

<b>Program data</b>	N/A	<ul style="list-style-type: none"> <li>● <b>PNT 2014-2018</b> - quarterly data on tuberculosis diagnosis, treatment, retreatment and treatment failure in each district, and on testing</li> <li>● <b>PNLP - mass campaign LLIN 2019</b>: data on the mass mosquito net distribution campaign (census, evaluation of needs and distribution)</li> <li>● <b>PNLP 2014-2018</b>: monthly data on the management of malaria cases among young children, older children and pregnant women</li> <li>● <b>CNLS 2016-2018</b>: annual data on serostatus awareness, treatment, viral load testing and viral load suppression</li> </ul>
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The PCE also created a statistical health system model to represent the relationship between tuberculosis-specific financial inputs, activities, outputs and results in Senegal. Some findings from this model allowed for triangulation with other evidence, as discussed in the tuberculosis section of the report. For more details on modeling of the tuberculosis health system in Senegal, see Annex 8.

Throughout the evaluation process, close contact was maintained with the programs. The results were shared and discussed. This allowed for feedback and comments from the programs, while the results also raised interest and reactions from the programs around decision making.

#### 1.4 Strength of evidence ranking

The PCE employs a mixed-methods approach to analysis. Together, triangulation across multiple data sources and analytic techniques lead to more robust findings.

The robustness of evidence in support of each finding statement was rated on a 4-point scale according to the level of triangulation and quality of the data. Triangulation refers to the breadth of qualitative and quantitative data sources that support the finding. Greater triangulation across multiple sources equates to findings that are more robust. The quality of quantitative data was evaluated based on the completeness of the data, internal consistency checks and the level of data recorded. Evaluating where data is missing and how much data is missing is important to ensure that there are no underlying reasons for missing data that could result in bias. Internal consistency checks ensure that numerical relationships between variables are logical (for example, tests that are positive should always be less than the number of tests completed). After considering these parameters, a strength of evidence rating was assigned to each finding (Table 3). This classification helps to identify results that require additional validation and triangulation, particularly if they are scored “3” or below.

**Table 3: Robustness of findings on a 4-point scale**

Rank	Rationale
1	The finding is supported by multiple data sources (good triangulation) which are generally of strong quality.
2	The finding is supported by multiple data sources (good triangulation) of lesser quality, or the finding is supported by fewer data sources of higher quality.
3	The finding is supported by few data sources (limited triangulation) of lesser quality.
4	The finding is supported by very limited evidence (single source) or by incomplete or unreliable evidence. Findings with this ranking may be preliminary or emerging with ongoing data collection.

## Chapter 2. Grant progress in Senegal

Senegal is classified by the Global Fund as a low-income country with a high disease burden for malaria, tuberculosis and HIV. It is thus included in the Global Fund's core portfolios, which refers to countries with high disease burdens and large financial allocations. The total Global Fund grant allocated to Senegal for the 2018-2020 grant period is €67,043,929 (Table 4). Motivated by a desire to streamline the grants, the Global Fund, CCM and the MSAS agreed to reduce the number of PRs from six (2015-2017) to four (2018-2020). MSAS became PR for the first time and is in charge of the TB-RSSH grant, and PNLP of the malaria grant. For HIV, there are two grants/PRs: Conseil National de Lutte contre le Sida (CNLS) and the Alliance Nationale des Communautés pour la Santé (ANCS), the latter of which acts on a civil society level with a particular focus on key populations.

**Table 4: Budget allocation for grants from 2018 to 2020**

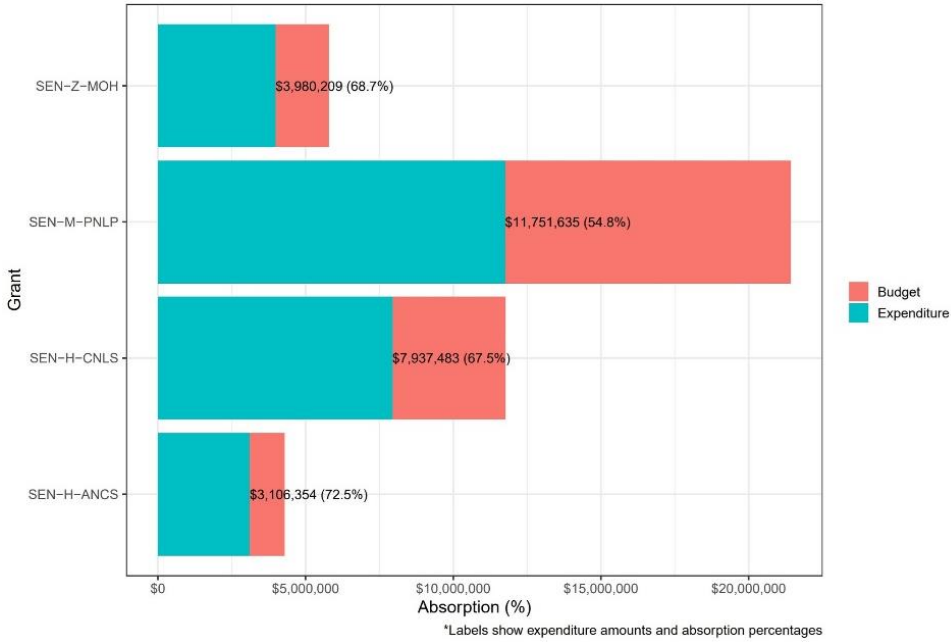
<b>Disease</b>	<b>Principal Recipient</b>	<b>Budget (€)</b>
HIV	Conseil National de Lutte contre le Sida (CNLS) - Government	€16,796,371
	Alliance Nationale des Communautés pour la Santé (ANCS) - Civil society	€7,142,905
Malaria	Programme National de Lutte contre le Paludisme (PNLP) - Ministère de la Santé et de l'Action Sociale (MSAS)	€32,796,371
TB/RSSH	Direction Générale de la Santé (DGS) / Direction de l'Administration générale et de l'Équipement (DAGE) - Ministère de la Santé et de l'Action Sociale (MSAS)	€10,743,845
<b>TOTAL</b>		<b>€67,043,929*</b>

*Source: 2018-2020 budgets approved at the beginning of the grant and revised on 28 February 2019.*

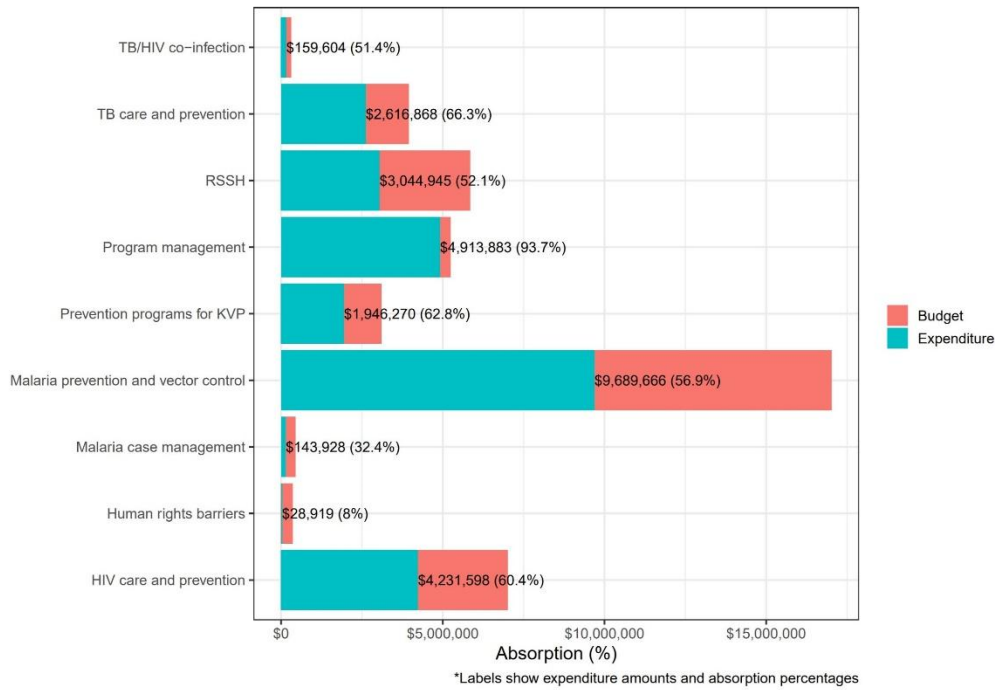
\* The total budget includes 2 million euros of catalytic funds for key populations and to reduce human rights-based barriers to health services. These funds are distributed between CNLS and ANCS.

During 2019, certain financial management challenges were noted. The trends in Figure 1 show low absorption rates during the first 18 months of grant implementation for the PNLP (SEN-M-PNL) and CNLS (SEN-H-CNLS) grants with 54.8% and 67.5% absorption, respectively, during S1-S3 (January 2018 through June 2019). This low absorption rate, which can be explained by early delays in launching and disbursement, affected the 2019 trends. Nevertheless, we note an increase in the absorption rate in 2019 compared to the first semester of 2018, which may be explained by the PR's decision to review the conditions for disbursement to SRs by lowering the justification rate to 50% from the required 80%. This decision may have unblocked and relaunched activity implementation. The cross-cutting factors that affected absorption rates are examined in more detail in Chapter 4 and in every disease sub-section.

**Figure 1: Absorption by grant, January 2018-June 2019**



**Figure 2 : Cumulative grant absorption by module, jan. 2018-juin 2019**



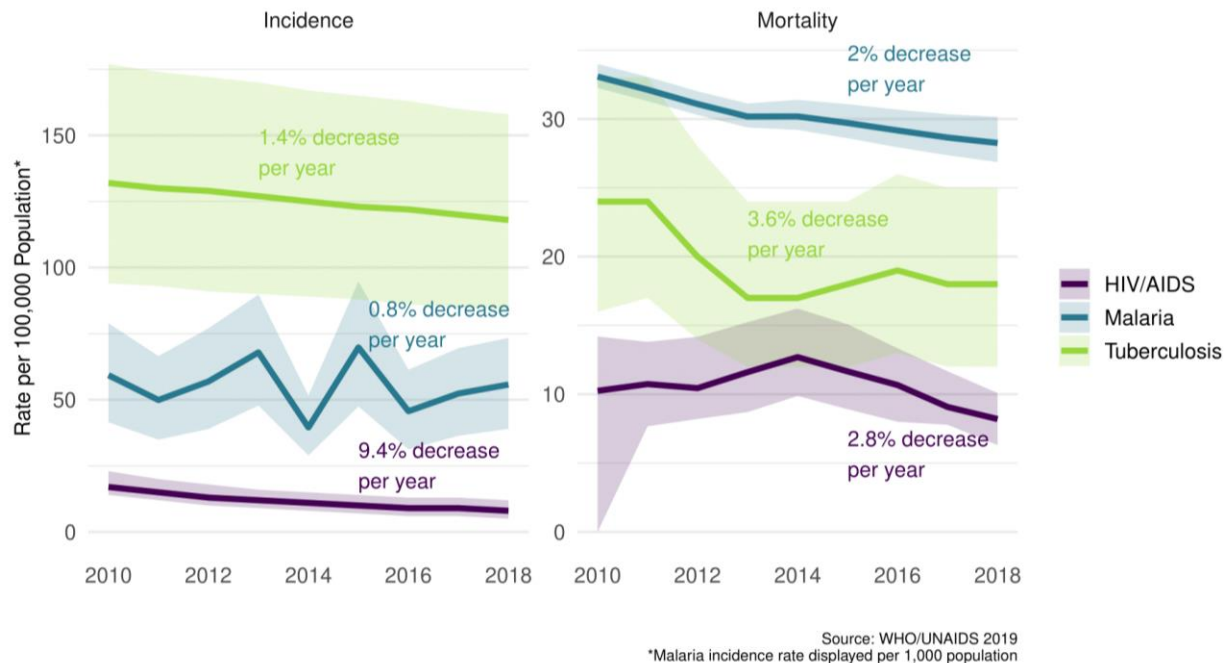
Source (fig 1, 2) : PU/DR

## Chapter 3. Contribution to national program

### Summary of the trends in Malaria, TB, and HIV in Senegal

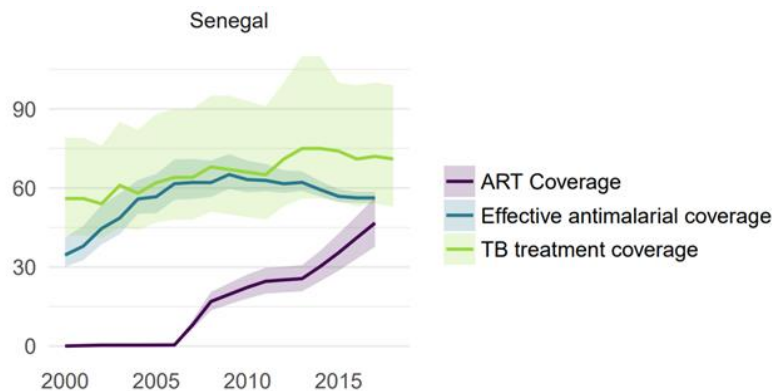
Since 2000, the incidence and mortality rates in malaria, tuberculosis and HIV have declined, although the decline has varied by disease. Figure 3 shows declining trends in the HIV incidence rate over the past 10 years. Incidence rates have also declined for malaria and tuberculosis though not at the same rate as HIV, and have remained higher in comparison. Mortality rates for all three diseases have also improved, with the greatest improvements for tuberculosis.

**Figure 3: National trends in incidence and mortality**



Improvements in incidence and mortality rates have been accompanied by better treatment coverage in Senegal. Figure 4 shows that over the past decade, TB treatment coverage and antimalarial treatment coverage have improved. Although TB treatment coverage has stalled over the recent years, it has remained close to 75%.

**Figure 4. Progress in treatment and prevention coverage**



Source (fig 3, 4): IHME Global Burden of Disease; TB coverage from WHO, LLIN coverage from Bhatt et al 2015 Nature

### 3.1 Malaria

The majority of Global Fund malaria investments in Senegal (55%) are dedicated to prevention through vector control (Figure 2B in Annex 2). The last mass LLIN campaign in Senegal had occurred in 2016. The 2019 LLIN campaign was conducted jointly with The Gambia, which is also working towards elimination. Contrary to previous years, no malaria grants were awarded to civil society groups. This change was accompanied by adjustments to the operational plan. This section presents the results, successes and challenges of the 2019 LLIN mass campaign as well as takeaways from the joint implementation with The Gambia.

#### Organization and rollout of the 2019 LLIN mass campaign in Senegal

An estimated 9,907,339 LLINs were needed for the 2019 mass campaign. Distribution was planned in all 14 regions of Senegal and occurred in two phases. The first phase, in the nine southern and central regions of Senegal, was conducted jointly with The Gambia, while the second phase took place in five regions in the north and west (Dakar, Louga, Thiès, Matam, Saint-Louis). Several partners supported the PNLP's LLIN allocation: (i) Global Fund, €4,076,902 (40%); (ii) President's Malaria Initiative (PMI), €3,500,000 (35%); (iii) Islamic Development Bank (IsDB), €2,000,000 (20%); and (iv) Organisation pour la mise en valeur du fleuve Sénégal (OMVS), €525,000 (5%). Furthermore, the campaign's operational costs were supported by the Global Fund at 83.7%, representing a financial contribution of CFA4,118,344,322; other operational costs for distribution (16.2%) came from IsDB funding representing a financial contribution of CFA798,000,000(1).

For the LLIN mass campaign, the following indicators were defined to evaluate program performance:

- **Distribution indicators:** (i) degree of achievement on original distribution targets, (ii) percentage of households having received LLINs (percentage of coupons exchanged) and (iii) percentage of LLINs exchanged.
- **Coverage indicators:** (i) person/LLIN ratio, (ii) ratio of LLINs distributed/habitual sleeping spaces.

**Finding 1: Despite the delay in launching the 2019 LLIN mass campaign, the PNLP successfully completed the mass campaign before the onset of Senegal's malaria transmission season, but this would not have been possible without strong support from the Global Fund Country Team and a very innovative approach of both matching funds (IsDB) and partner cooperation (PMI, World Health Organization (WHO), Global Fund, etc.).**

*Robustness: (ranking = 1) The conclusion is corroborated by triangulation across multiple sources of data, including high-quality key informant data and evidence from document review (including dates when key grant milestones were achieved). Key informant interviews (KII) indicate a convergence of opinions across stakeholders.*

The launch of the mass campaign was delayed by two months from initial projections, despite Global Fund and other partners having already secured LLIN stock several months prior. These delays were primarily due to: (i) long procurement procedures that led to significant delay in SR selection; (ii) PNLP's institutional instability due to a change in the program's coordination unit at a crucial stage during NFM2 launch; and (iii) health system weakness with a long health sector strike in 2018 looming over all interventions that relied on the health system, including the mass campaign. Stakeholders highlighted the difficulty in launching the mass campaign, which took almost six months of preparation. In addition, there was a gap caused by the lack of an SR contract to support PNLP. Consequentially, the program staff fully focused on the mass campaign and temporarily abandoned routine training and supervision activities. Some have said that the



operationalization of aspects of LLIN mass campaign implementation in the field should not be delegated to the national program.

*“A program should instead play a strategic, guiding, structuring role, to assure that things get done, but not go do...” (Quote from a key informant)*

Nevertheless, others feel that the program has enough experience to conduct mass campaigns. If that is the case, then there is a need for better organization so as not to put other routine activities at risk. Several factors contributed to campaign success and to the acceleration of the implementation process:

**(i) The Global Fund’s flexibility and the Country Team’s involvement in addressing implementation challenges** by authorizing the use of army networks to circulate mosquito nets in lieu of another agency given that quick timeframes were essential to synchronize with The Gambia’s efforts. The Global Fund also took the risk of authorizing expenses without having validated the overall budget.

*“That’s the flexibility that we had, we should not have done that as funders, but others will tell you that if the Global Fund had not also been there, the campaign would not have happened without this partner support.” (Quote from a key informant)*

**(ii) Multisector approach in controlling malaria**, with involvement from different ministries (Armed Forces, National Education, MSAS), is an important factor that has contributed to the mass campaign success and may lead to intervention sustainability.

**(iii) Partnership** has been crucial in accelerating the mass campaign implementation. The IsDB, PMI and OMVS helped procure the LLINs; this partnership furthermore facilitated information sharing and strengthened strategic monitoring of the LLIN mass campaign. As the Global Fund is not a member of the mass campaign pilot committee, involvement of PMI was crucial in relaying relevant information in a timely manner.

**Finding 2: The distribution of LLINs in border zones between The Gambia and Senegal greatly considered the public’s preference of mosquito nets to increase use. Nevertheless, the variability of LLINs distributed among other localities in Senegal could influence mosquito net use; coverage and use of surveys will be necessary in post-distribution monitoring.**

*Robustness: (ranking = 1) The conclusion is corroborated by triangulation across multiple sources of data, including high-quality key informant data and evidence from document review (including dates when key grant milestones were achieved). Analysis of LLIN distribution, coverage, and type, as well as key informant interview (KII) data indicate a convergence of opinions across stakeholders.*

In its 2016-2020 National Strategic Plan (NSP) (2), the PNLP sought to increase mosquito net use to 85% among children under 5 years old and to 70% among the general population. Nevertheless, national survey data in 2017 showed LLIN usage was around 56.9% for the general population and 60.7% for children under 5 years old (3). Optimizing LLIN use requires successfully raising awareness and considering community mosquito net needs. A recent study showed that people preferred circular nets (easier to hang) with a not-too-rough texture (less likely to cause irritation) and blue (less likely to look dirty) (4). However, the products preferred by the public seem to be the most expensive, thereby raising the question of cost in the final decision of which brand to make available to the country. In order to align interventions with The Gambia and fulfill the public’s preference, the Global Fund showed a certain degree of flexibility on the choice of mosquito net. This allowed the PNLP to distribute the same brands of nets in zones bordering The Gambia in order to remain consistent.

*“The Global Fund adopted this strategy so that communities would not go to The Gambia to take the Gambians’ nets, as communities prefer the Yorkool brands.” (Quote from a key informant).*

In other zones, however, other brands were distributed. Since every financial partner has their own procedures for selecting mosquito nets, the LLIN brands distributed in the countries may vary. According to the various stakeholders interviewed, once the PNLP’s needs are specified, negotiations are usually undertaken with partners to agree on the types of mosquito nets, which leads to variability. According to a key informant, the CT and the Global Fund had agreed to the type of LLIN’s to be distributed in non-border areas.

Besides preference, other contextual factors may influence mosquito net usage (7). Faced with the variability of LLIN brands distributed during the 2019 mass campaign, a post-distribution monitoring plan with household surveys documenting level of use and determinants for use is necessary to collect to understand the effectiveness of the 2019 mass campaign, as well as to inform future programmatic actions that could improve usage.

It will be important in 2020 to elaborate on a plan to accelerate coverage and utilization of the LLINs to meet the gaps in the NSP indicators for 2018-2020. This effort will require two major objectives: 1) intensive and targeted distribution of LLINs to improve coverage, 2) intensive media and communication campaign to increase use of LLINs by households. These objectives would need to be funded by reprogramming available resources, given that the absorption rate in this area was 54.8% in June 2019.

Finally, to accelerate the elimination of malaria, it is important to evaluate the implementation and the impact of the LLIN mass campaign on the coverage and use of LLINs to inform any necessary remodeling of the programs to maximize effectiveness.

**Finding 3: The organization of a joint campaign between The Gambia and Senegal, in addition to helping to accelerate the LLIN mass campaign implementation process, led to improvement in mosquito-net coverage indicators for Senegal. This intervention model could serve as a basis for the development of cross-border malaria elimination initiatives.**

*Robustness: (ranking = 2) The conclusion is corroborated by several high-quality data sources, including key informant interviews at the national level, document review and analysis of LLIN coverage at the border zones, except for situational differences between the first and second phase.*

The mass campaign occurred in two phases, with the first phase conducted jointly with The Gambia. Although The Gambia was to complete its mass campaign in 2020, they decided to opt for the synchronized campaign instead. The two countries rely on different internal organization structures. In The Gambia, a civil society PR supported the PNLP to implement the mass campaign, while in Senegal, the PNLP was the primary implementer, due to issues contracting an SR to carry out the work.

8,546,871 LLINs were distributed, representing 86.26% of the initial program target (Annex 2, Table 2C). The percentage of households that received a LLIN during phase 1 of the mass campaign was, on average, around 98.2% (95% CI: 91.3%-96.5%) compared to 93.9% (95% CI: 91.3%- 96.5%) during phase 2 of the mass campaign (p=0.0005). The better performance observed in phase 1 could be due to several factors:

1. The first phase benefited from better involvement of actors other than the PNLP, such as PMI, OMVS and Catholic Relief Services (CRS) (The Gambia); these partners worked hard to map households, collect census data and communicate about the mass campaign;



2. Timely delivery of a sufficient number of LLINs: Shortcomings in the second phase include (a) weak consideration of geographic and especially urban specificities during phase 2; (b) shortcomings in the census conducted in high population density urban zones such as the capital (Dakar); (c) weak capitalization on the implementation evaluation from phase 1, especially in terms of internal organization; and (d) poor distribution ratios and challenges in LLIN availability storage and delivery difficulties to stock coverage issues in certain locations, such as Dakar and Touba. Nevertheless, in the absence of an evaluation dedicated to this matter, it is difficult to comprehensively determine the mechanisms behind the difference in performance between the two phases.

*“In the central-east region for phase 2, the risks were really much greater than for phase 1 due to these issues of preparation, we had asked: (i) for a specific strategy for Dakar, (ii) was there enough mosquito nets for the entire territory and was there a sweep?”*  
(Quote from a key informant)

**Figure 3: Quality of LLIN coverage**



Source: 2019 LLIN mass campaign, PNL

Beside achievements in terms of coverage, aligning interventions with The Gambia was perceived as a factor that contributed to an accelerated implementation of the 2019 LLIN mass campaign. Indeed, following the delays observed in implementing the NFM2 grant, Senegal was forced to find alternate solutions to accelerate the mosquito net distribution process so as not to delay The Gambia who had less constraints in implementing the mass campaign. Furthermore, the joint LLIN mass campaign with The Gambia reinforced the partnership between the two countries in cross-border activities, which represents a significant advance in controlling malaria. This framework of exchange between the two countries' programs should lead to an acceleration in progress towards elimination through the development of regional antimalarial initiatives.

*“The joint campaign settled policy questions with regard to malaria control. The two ministries of health signed a Memorandum of Understanding (MoU). In the MoU, the two countries plan to integrate their malaria surveillance systems. The two programs are currently looking at what else they can do together. The Gambia is thinking about integrating PEDACOM (home-based management) as part of their management strategy.”* (Quote from a key informant)

The political (in both countries) and strategic (PNLP, WHO, Global Fund) leadership tackled issues related to cooperation:

*“All of this is due to the cooperation and synergistic approach that the PNLN developed and that showed a bit of who can do what, and to ensure that, from an implementation perspective, different funders are complementary.” (Quote from a key informant)*

### 3.2 Tuberculosis

The WHO estimates that around 30% of pulmonary tuberculosis cases in Senegal are not diagnosed(5). The treatment coverage of patients with MDR-TB remains low (68%) (8). Routine data have shown higher rates of tuberculosis notification among men and rates varying by region. The majority of the Global Fund’s TB/RSSH grant is dedicated to the treatment and prevention of tuberculosis, with the largest share of this budget going to anti-tuberculosis care services (€2,818,769), as well as case detection and diagnosis (€1.2 million). In this section, we discuss findings on how Global Fund investments help improve tuberculosis case management and treatment coverage, with an emphasis on tuberculosis notification and MDR-TB case management.

**Finding 4: Despite Global Fund investments in tuberculosis, the number of confirmed TB cases remained relatively unchanged, while disparities by gender, age and geography suggest potential inequalities in anti-tuberculosis care services exist. However, this is difficult to ascertain in the absence of prevalence data.**

*Robustness: (ranking = 1) The conclusion is corroborated by triangulation across multiple sources of data, including high-quality key informant data and evidence from document review (including dates when key grant milestones were achieved). Key informant interviews (KII) indicate a convergence of opinions across stakeholders. This has motivated the suggestion to gather supplementary prevalence data.*

There has been progress in tuberculosis control in Senegal in the last decade. Notified tuberculosis cases have progressively increased from 1990 to 2015 (6), and stabilized during the last four years to below 13,000 per year (8) (vs. 19,000 total cases per year estimated by the WHO(5)). The Global Fund invests significant resources to advance progress against the disease. The majority of the Global Fund’s TB/RSSH grant is dedicated to tuberculosis treatment and prevention, with the largest share of this budget going to anti-tuberculosis care services (€2,818,769), as well as case detection and diagnosis (€1,233,956). However, age-based analysis shows that gender-based disparities only exist among adults, where most cases occur (8). Senegal is quite aware of this situation and Plan International (TB sub-recipient) has implemented actions targeting men at their workplaces [Workplace Visit] (since it is difficult to find them through home visits). Although there are targeted efforts to address these ongoing disparities, more interventions should consider aspects that could be tied to age and gender, especially among adults.

Modeling suggests that workplace visits could be a successful intervention in locating cases. Home visits conducted as part of Global Fund-financed community care have been strongly associated with the identification of persons with a cough lasting more than two weeks and their subsequent referral for treatment. Furthermore, a positive correlation between home visits and child referrals has been observed in all regions of Senegal (see Annex 8, Part 4, Finding 4).

Around 70% of notified cases are concentrated in the Dakar, Thiès, and Diourbel regions (Annex 3, Table 3A). This situation had already been noted in the 2018-2022 PNT strategic plan and should be considered during the rest of NFM2 and as part of the NFM3 Funding Request. PNT plans to implement tailored approaches for diagnoses, communication and community interventions in these high-density and activity-intensive regions.

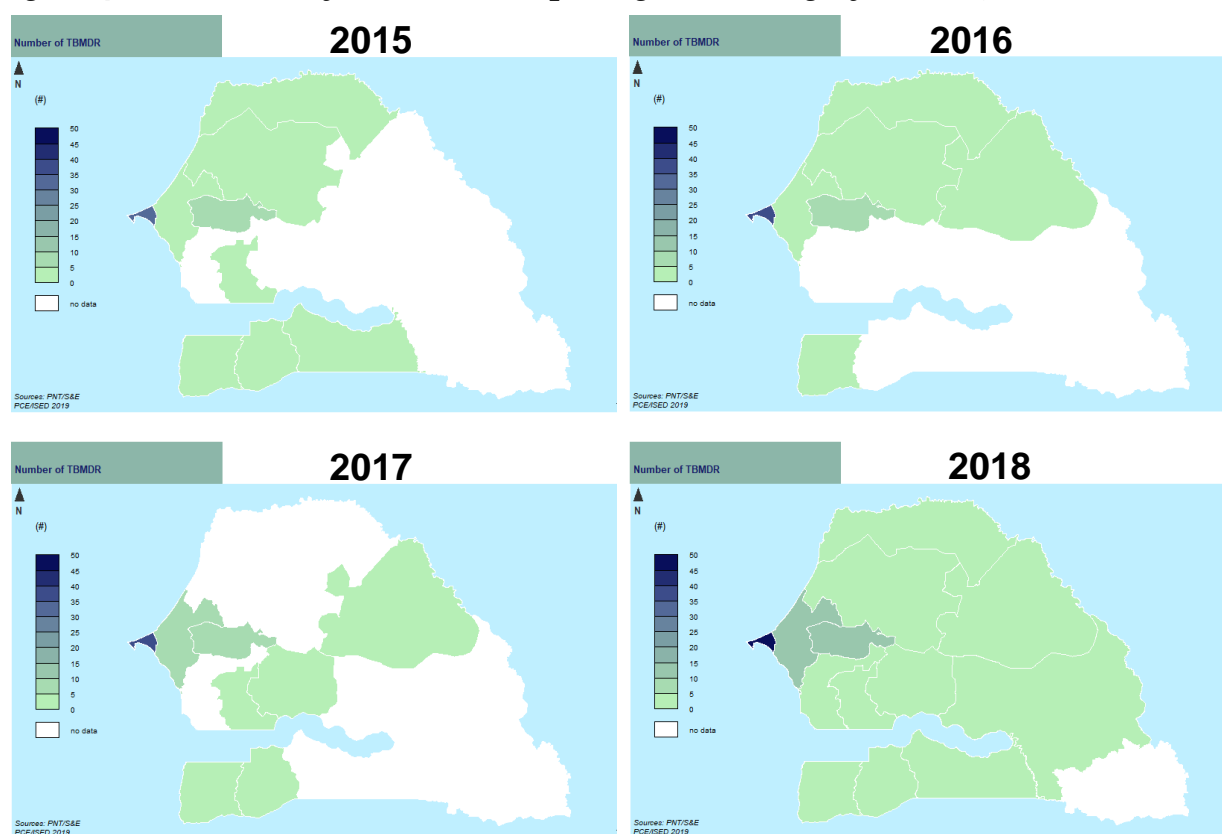
The modeling results suggest that the percentage of those cured from TB has not increased despite increases in detection. Future program objectives should account for the fact that as new TB cases are detected, an increasing number will not be treated, especially in certain regions: Sedhiou, Kolda and Saint-Louis.

**Finding 5: The number of detected MDR-TB cases has likely increased between 2015 and 2018 due to increased coverage, the use of GeneXpert machines and improved treatment availability. Nevertheless, efforts to strengthen TB and MDR-TB case detection have been blocked by an inability to procure additional GeneXpert machines.**

*Robustness: (ranking = 2) The conclusion is corroborated by multiple good-quality data sources, including key informant interviews at the national level to understand bottlenecks.*

As with case detection, the detection of multidrug-resistant tuberculosis cases has greatly improved between 2015 (53 cases) and 2018 (88 cases) (Figure 4). Nearly all districts detected cases of multidrug-resistant tuberculosis in 2018, with the exception of the Kédougou region. Although the availability of GeneXpert machines remains limited (only 22 machines in the entire country in 2017), the proportion of cases detected by GeneXpert has slightly increased between 2015 (8%) and 2018 (9%), which could in part explain the increase in number of MDR-TB cases detected.

**Figure 4: Distribution of MDR-TB cases per region in Senegal from 2015 to 2018**



Source: PNT

Despite this progress, it seems that case notifications are not done rapidly enough to achieve the treatment initiation objectives, since treatment coverage of patients with MDR-TB remains weak (68%) (10). In 2018, 88 patients with MDR-TB initiated treatment, suggesting that the objective of 218 patients treated in 2022 will be difficult to attain (6).

There are several obstacles to better MDR-TB detection. First, coverage of diagnostic units for tuberculosis is between 1/125,000 to 1/500,000 people, which is lower than the WHO standard of 1/100,000 people (6). In the new *Halte à la tuberculose* (Stop tuberculosis) strategy, the request for TB/RSSH funding included the introduction of the GeneXpert MDR-TB/Rif test starting in 2019 in the six regions with highest disease burden and where it is estimated that 81%

of cases are diagnosed. The request for funding included procuring 58 machines to expand coverage and improve detection and diagnosis. Unfortunately, the machines could not be procured as planned. Indeed, 24 GeneXpert machines that the MSAS tried to procure in 2018 were never received due to a fraudulent transaction in which the money was unknowingly transferred by the MSAS to a counterfeit bank account (11). Consequently, the government agreed to mobilize its own funds and to proceed with a new purchase. At the time of writing, the PCE had not yet been able to locate a document showing the time frame and contracting plan for when these GeneXpert machines would become available through the government contract. In response, the Global fund has strongly recommended that state partners create and use professional email accounts for exchange of Global Fund-related information.

However, the results (Annex 3, Table 3A) show that GeneXpert machine use is not only dependent on availability. Indeed, level of use is heterogeneous among regions with access to only one GeneXpert machine. Other input gaps such as cartridges and facility accessibility can explain this situation, particularly in eastern Senegal.

TB modeling results for the health system suggest that Global Fund and other funders' investments in MDR-TB (and drug-susceptible tuberculosis) lead to a greater use of GeneXpert machines (for example, we see more people tested with GeneXpert machines overall). The model also shows that an incremental increase in GeneXpert machine use leads to several diagnosed MDR-TB cases. However, for drug-susceptible tuberculosis, the model does not show that GeneXpert machine use leads to more diagnosed cases. This is likely due to the fact that drug-susceptible tuberculosis is also diagnosed through other methods such as microscopy, pulmonary radiography or based on symptoms.

Finally, we note a weak functionality of the implemented regional MDR-TB committees, despite the TB/RSSH grant supporting the organization of monthly meetings for these committees. These meetings were created to decentralize patients' treatment decisions but, due to a lack of budget, they have not been truly operational. Indeed, the absence of supporting documentation for the initial funding upon which other disbursements are conditional explains why the transfers are delayed. This in turn leads to a stoppage in regional committee activities and consequently MDR-TB management.

*“Since we haven't had a grant disbursement since March, the decentralized committee no longer operates and that's tied to resource mobilization.” (Quote from a key informant)*

It is perhaps timely to revive supervision and medical state committees to collaborate with the decentralized authority and develop a management framework to ensure the effective and timely justification of funds to allow for disbursements.

**Finding 6: Despite commitments made during the grant allocation period, the government will not be ready to finance second-line treatments against multidrug-resistant tuberculosis by 2020.**

*Robustness: (ranking = 1) The conclusion is corroborated by triangulation across multiple sources of data, including high-quality key informant data and evidence from document review (including dates when key grant milestones were achieved). Key informant interviews indicate a convergence of opinions across stakeholders.*

There have been several advances in the past few years to increase the availability of drugs (first-line medication purchased by the State) and of diagnostic and monitoring tools through the Pharmacie Nationale d'Approvisionnement (PNA) and the Pharmacies Régionales d'Approvisionnement (PRA). However, the transition of purchasing second-line treatment drugs from the Global Fund to the government starting in 2020 (as promised in 2015 and delayed once already in 2017) remains challenging.

The first reason for the potential delay are logistical challenges tied to procurement. The State has found that these products are difficult to procure. For example, the PNA must undergo long procedures.

*“We have discussed the need to prepare a transition plan, but since this medication has never been on the National Essential Medicines List for purchase, it must first have a marketing authorization (MA) from the Direction de la Pharmacie et du Médicament (DPM), all that must therefore be prepared in the transition plan.” (Quote from a key informant)*

Administrative slowness tied to grant launching and procedural changes on procurement issues (see quote above) risk to further hinder second-line drugs procurement if the country does not initiate the steps to order the drugs on time. The drugs are often difficult to procure and orders often take a long time. The PNA and the PNT’s supply service have often sounded the alarm and communicated their worries on this matter. Finally, a problem highlighted by stakeholders is the issue of foresight in view of future difficulties and the effective coordination of services. Stakeholders are not familiar with the challenges tied to supplying the program and, thus, coordination and problem-solving meetings are not effective due to the absence of key players who could accelerate the decision-making process.

Political challenges are also obstacles. Indeed, on a policy level, it appears that decisions related to the procurement of treatments against MDR-TB was made by the MSAS without in-depth consultation and, for this reason, the commitment is not well understood, nor adopted by the stakeholders.

Another challenge facing the PNT and PNA will be the timely establishment of funding to procure the drugs. Indeed, the Global Fund is able to make the funds for drug procurements available, but many delays are noted at the national level. In the face of certain procurement issues, the Global Fund has more than once been called in to support the country. Order placement was delayed and the necessary funding for procuring these drugs has not yet been set aside by the State. Given this situation, there is a real risk of second-line drug stockout in 2020. The State should also increase its budget, since the amount allocated by the Global Fund (around CFA 500 million) doubles the amount that the Senegalese government has up to now given the PNT for drugs.

The PNA also does not have the same purchasing capacity as the Global Fund. In order for the purchases to be successful, Senegal should pool them at the regional level with those of other countries, but such measures have not been taken. Issues raised by stakeholders suggest that the government will not truly be in a position to honor their commitment unless corrective measures are taken.

### **3.3 HIV**

In Senegal, HIV infection is concentrated in key populations (MSM, sex workers (SW) and people who inject drugs (PWID)). In NFM2, HIV funding is €23,939,276, of which €16,796,371 go to the CNLS and €7,142,905 to the ANCS, a civil society organization whose activities specifically focus on key populations<sup>1</sup>. These amounts include €2,070,982 in catalytic funds, which represent an opportunity to stimulate programming and allocation use in the strategic priorities of the Global Fund and its partners. By 2020, the program’s major objective is that 90% of persons living with HIV know their status, that 90% of these people benefit from ARV treatment and that 90% have an undetectable viral load.

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<sup>1</sup> SEN-H-ANCS/CNLS\_Budget from 28 February 2019.



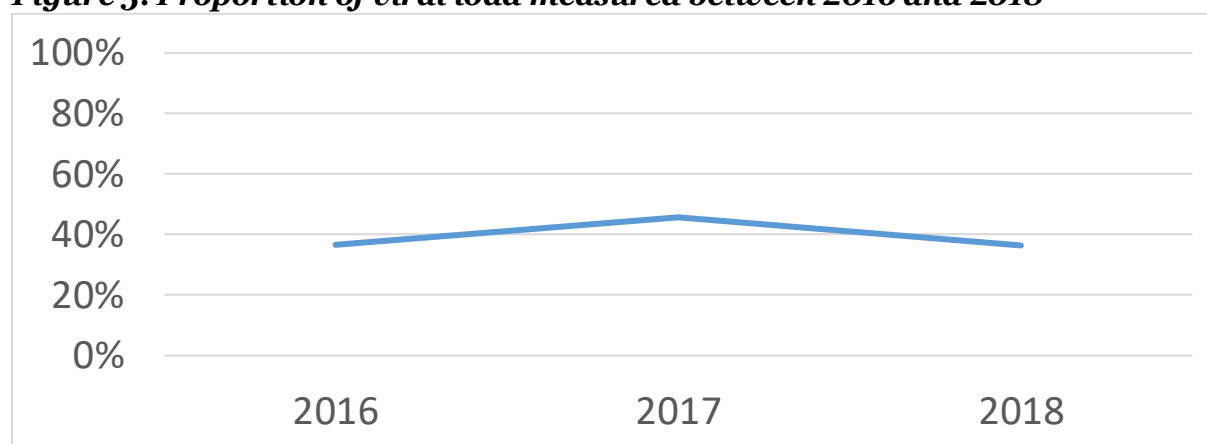
In this section, we will discuss our findings on the way in which Global Fund investments help achieve the 90-90-90 objectives.

**Finding 7: The proportion of people living with HIV (PLHIV) who have had their viral load measured remains low despite investments to extend machine availability, due to challenges in training service providers on machine use, input gaps, and supply chain procedures.**

*Robustness: (ranking = 1) The conclusion is corroborated by triangulation across multiple sources of data, including high-quality key informant data and evidence from document review (including dates when key grant milestones were achieved). Key informant interviews indicate a convergence of opinions across stakeholders.*

The proportion of people living with HIV in ARV treatment who have had their viral load measured has varied between 30% and 50% between 2016 and 2018 (Figure 5). In order to improve access to viral load testing, the Global Fund secured funding through a public-private partnership for eight viral load machines during NFM1. Current grants have also planned for GeneXpert machine use in cooperation with the PNT in order to further strengthen viral load measures, but it has not yet been implemented.

**Figure 5: Proportion of viral load measured between 2016 and 2018**



Source: Routine CNLS data

Despite these investments, the performance level has stayed relatively unchanged between 2016 and 2018. This situation may be primarily explained by: (i) viral load machine unavailability or failure in 2018; (ii) stockouts of products or inputs necessary for their functioning; (iii) the absence of a formal network for the transfer of samples; and (iv) low use of tools to measure viral load.

*“If I take this year’s example, the PNA will not use more than 30 percent of the funding that we have for drugs and reagents... there are also tensions and even maybe stockouts with this time that we lose... the big challenge is supply because that’s the biggest expense.” (Quote from key informant)*

In addition to the unavailability of necessary devices for measuring viral load in some regions, it is also worth noting that the absence of a formal network has negatively influenced viral load performance. Indeed, service providers use different methods for transferring samples meant for viral load testing and the return of test results is neither standardized nor systematized. Consequently, the results are not always made available to the patient. On one hand, the results often also take over six months before being returned to the original health facility, or are never returned. On the other hand, some providers do not systematically send the results to the closest health facilities but instead continue to send them to Dakar, which takes longer. Patients in some regions continue to go to Dakar for treatment or checkups because at first, everything was done

in Dakar, but also because there is more confidentiality for people living with HIV when being treated outside of their home region, particularly in Dakar.

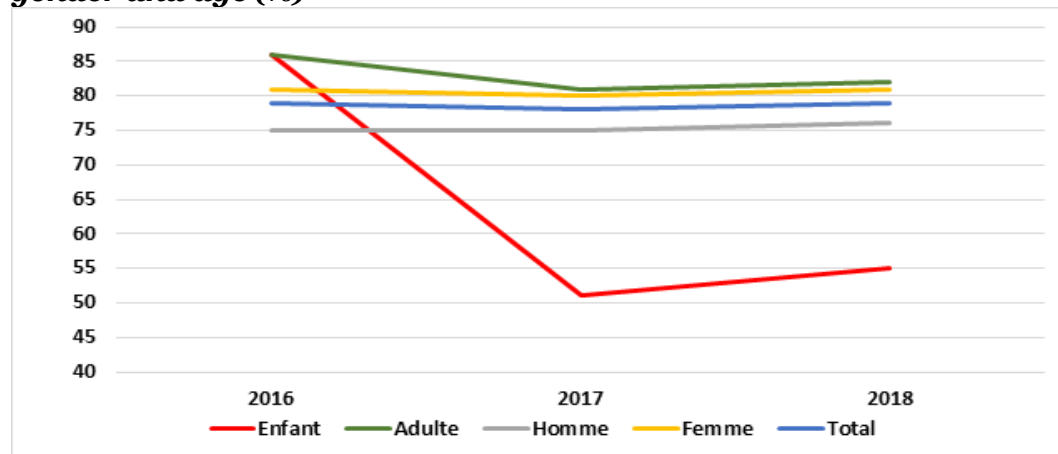
Furthermore, we note an insufficient usage of devices for viral load measuring. The actual level of machine use remains relatively low: between 2016 and 2018, less than 10,000 viral load tests were conducted per year despite an annual capacity of 10,000 tests per machine. According to stakeholders, weak viral load device use is due in part to stockouts of inputs for these machines despite Global Fund support and because the machines currently used for viral load measurements are complex and require a certain level of technical knowledge. GeneXpert machines used for tuberculosis screening and diagnosis are also being rolled out for HIV. These GeneXpert machines are a good stopgap for the currently low level of machine use. According to stakeholders, the GeneXpert machines are deemed simpler to use and are lighter, which should consequently increase its use. It is strongly recommended, with the goal of helping to improve viral load testing, to regularly monitor their rollout, but also to insist that the State, following its commitment letter, act on making the expected GeneXpert machines available. It is furthermore recommended that input availability, as well as a functional supply chain for these machines, be solidified, and that service provider trainings lead to increased use.

**Finding 8: Viral load suppression is low among children and men. Socioeconomic difficulties and the need for routine assessments increase the inaccessibility of health facilities, particularly among vulnerable populations.**

*Robustness: (ranking = 1) The conclusion is corroborated by triangulation across multiple sources of data, including high-quality key informant data and evidence from document review (including dates when key grant milestones were achieved). Key informant interviews indicate a convergence of opinions across stakeholders.*

The proportion of undetectable viral load has remained constant from 2016 to 2018 (79%). It is slightly higher among women during this period. We note a lower rate among children, while among adults we observe only a slight decrease between 2016 and 2017 (Figure 6).

**Figure 6: Proportion of undetectable viral loads out of all viral loads by patient gender and age (%)**



Source: Routine CNLS data

Women have more opportunities to visit health facilities than men (antenatal care (ANC), prevention of mother-to-child transmission of HIV (PMTCT), appointments, etc.). Nevertheless, there are many challenges for PLHIV in general. First, routine assessments that are necessary for PLHIV, at intake and at times of a change in protocol are problematic.

*“There is a shrinkage of funding that no longer allows for the management of health assessments... The other challenge is also nutritional support allowing very vulnerable populations to have a balanced diet...” (Quote from a key informant)*

Another challenge is that the socioeconomic situation of target groups is generally precarious, especially among children. Furthermore, children are often even more vulnerable as they are often orphans. This observation led CNLS, with partner support, to initiate corrective actions within the framework of PMTCT and with children LHIV. Through the implementation of the 2018-2020 accelerated relaunch program with “Ndeye Ndicke” and the “Mother Mentor” concept, children are mentored by a community mother, with the aim of support to monitor adherence, care and testing for viral loads, and other similar areas. This program also seeks to close the gap in terms of nutritional and transportation support for children, which was not initially considered in NFM2.

Stigmatization and self-stigmatization remain major obstacles for both the screening and management of MSM.

*“There is stigma, which is a reality even at the management sites level; at the health facility-level there are forms of stigmatization from care providers (...) we try to address it by developing new strategies such as de-medicalized screening or self-testing.” (Quote from a key informant)*

Although the proportion of people on ARVs varies between 75-90%, the distribution of drugs for regular treatment that could lower viral load comes up against several shortcomings (stockouts and uncertain supply). Only civil society, which uses its own network, has no difficulty with ARVs arriving at treatment sites.

It is important to readjust current strategies by implementing action plans that remove these challenges and fill gaps. Policy reprogramming that is ongoing or planned by some stakeholders in the coming months is therefore a golden opportunity.

**Finding 9: Catalytic funds help to accelerate interventions targeting key populations. In the third trimester of 2018, mobile clinics began offering antiretroviral treatment. Despite these efforts, legal barriers tied to sociocultural backgrounds persist.**

*Robustness: (ranking = 2) The conclusion is corroborated by multiple good-quality data sources, including key informant interviews at the national level.*

Funding allocated to increase impact among key populations is €3,245,161, including €980,208 from catalytic funds. As for the distribution of these funds, 37% are intended for MSM, 36% for PWID and their partners, and 27% for SW and their clients. For MSM and SW, the activities covered are generally screening and prevention services, unlike PWID for whom funding focuses on treatment (sexually transmitted infections (STIs) and substitution).

It is worth noting that at the community level, the ANCS limited its activities to primarily screening and STI management. Mobile (funded by USAID) and community (Global Fund) clinics were only deployed in the third trimester of 2019. They are open for all health services, not only to PLHIV, in order to avoid stigma. Under the supervision of doctors, they now offer antiretroviral treatment by targeting key populations. It should be noted that the catalytic funds were not approved and included in the grants until April 2019, and it is therefore strongly recommended that the PCE continue to follow this new strategy that could significantly improve prevention and treatment coverage among MSM.

For removing human rights-related barriers, the amount of funding allocated is €1,165,231, of which 94% (€1,090,775) is financed with catalytic funds. Activities planned include those to



support reducing stigma and discrimination, acquiring basic legal knowledge but also training health professionals on issues of human rights and medical ethics related to HIV control. With this funding, the country will implement a human rights program at this scale for the first time. However, the CT belatedly signed a contract with a consultant to provide technical support in strategy implementation. This allocation is furthermore deemed weak in terms of prevention, screening and treatment needs for MSM among whom prevalence is rising. Other than this stated weakness, the implementation of activities under these funds has been negatively impacted by long procedures, namely for the ANCS. For example, one of its SRs and strategic partners with experience among these target groups did not want to commit because of the short timeframe and the high targets with little adjustment on the human resources budget to account for this increased demand. ANCS was thus forced to do the work itself and manage the organization of a national-level campaign to offer services to key populations.

The PR and SRs organized themselves to reach the Global Fund indicators, despite limitations imposed by the reduced number of SRs and the difficulty of completing activities covered by catalytic funds. However, by replacing SRs in the field, the PR was forced to sacrifice other activities. ANCS was forced to send administrative personnel to the field to fill this gap. Administrative personnel were expected to respond to a cyclical situation based on the catalytic funds and the need to improve execution and absorption of the ongoing grant. For a more planned approach, these realities of responding to the funds should be discussed with the CT.

An analysis of the sociocultural context revealed two major challenges to access to services by MSM and the promotion of human rights: 1) the intensifying outcry among religious groups, especially since 2019, for Senegal's government to state a position against MSM, and 2) certain NGOs at the level of the civil society have suggested in the media that support for MSM equates to promotion of homosexuality. The religious positions and those of NGOs, added to the occasional harassment towards MSM groups present as challenges to the implementation of activities for key populations. Thus, interventions aimed at promoting human rights and supporting services for MSM groups must put more emphasis on the contextual aspects through innovative, strong and targeted strategies to gain sociocultural acceptance.

*“The CNLS can only advocate and generate awareness among actors of the importance of respecting human rights and all, because with the nature of the epidemic or the epidemiological profile that we have, the key populations have the highest prevalence and are also among the general population (...) Senegal is quite unique... The MSM are almost all married.” (Quote from a key informant)*

**Finding 10: The budget allocation for the prevention of HIV increased from NFM1 to NFM2 and targets primarily key and vulnerable populations, but stakeholders emphasized the necessity of investing in prevention activities for the general population.**

*Robustness: (ranking = 3) The conclusion is corroborated by multiple good-quality data sources, including key informant interviews at the national level and document review with the aim of understanding bottlenecks. Nevertheless, certain quantitative data show satisfactory levels of achieved prevention among key populations.*

Around 50% of the CNLS budget is allocated to case management, while the budget allocated for prevention among MSM and SW is low. For the ANCS, the funds allocated to prevention are 32% of their budget in contrast to 21% in the CNLS budget.

In general, we find that after a reduction in the overall grant for both PRs between NFM1 and NFM2, prevention activities for key populations are more impacted by this decrease, and had it not been for the catalytic funds the community activities would have seen less intensity and less performance. Furthermore, it is also a general observation that prevention activities among youth

are almost non-existent. This is of concern as the 2018 CNLS annual report shows that 32% of new infections in Senegal are among children 0 to 4 years old and 27.9% are among youth 15 to 24 years old (12).

*“Resources for generating awareness to the benefit of key populations have greatly decreased but the program is trying to really bring back signage and messaging at the general population level.”*

*“It is a great challenge (decrease of resources vs. objectives to achieve). We do a lot of advocacy, we bang on tables, we discuss with the State, with the Global Fund, with the CCM to ask that the funding for civil society be increased. Actually that’s what led to the catalytic funds arriving like a lifebuoy.”*

*“It’s that the Global Fund for the community or civil society part, decreases more and more the amount of funding, we went from 30 NGO sub-recipients to 10, meaning that every time we start a new grant the budget is decreased and we are forced to eliminate field partners and that creates a huge gap.”*

*(Quotes from key informants)*

The reduction in the number of SR is therefore dictated, according to key informants, by the reduction in allocated funds, which is not without consequence on the performance of their overall activity portfolio. Alternatives created to meet commitments made to the Global Fund are to the detriment of the implementation of other activities, and entail an upheaval of the internal organization: the administrative personnel is called to conduct awareness-raising and screening activities in the field as part of the catch-up campaign.

The reduction in resources (prior to the arrival of catalytic funds) not only impacted activities, but also the management and administration of programs, namely within civil society. This impact often translates into personnel turn over, as well as staff reduction. Key informants also noted that the resources that are allocated to community actors do not allow for the recruitment of quality personnel. Nevertheless, performances in 2017 and 2018 show satisfactory screening rates often near 100%. The results of the 2018 report also show that 100% of the key populations benefited from the preventative HIV program according to the defined package for the target group (12).

To eventually achieve disease elimination, it seems necessary to increase resources and lead prevention activities among the general population, particularly with youth who seem to ignore precautionary measures.

## Chapter 4. Application of the Global Fund investment model

### 4.1 Cross-cutting enablers and obstacles to grant implementation

The table below summarizes how the Global Fund’s investment model in Senegal, including the way in which its policies, processes and structures overlap with contextual country factors, enable or hinder progress towards impact achievement. Enabling factors and obstacles are synthesized from PCE evidence collected to date, with some described in detail in the following sections.

*Table 5: Factors facilitating or hindering grant implementation*

<b>Global Fund investment model factors</b>	
<b>Facilitating factors</b>	<b>Hindering factors</b>
<ul style="list-style-type: none"> <li>• Monitoring framework established by the CT.</li> <li>• Bi-annual and annual review of the Global Fund.</li> <li>• Procedural manual facilitating comprehension of the rules for the PRs.</li> <li>• Flexibility for the country to take certain decisions (e.g., lower justification rate from 80% to 50%).</li> <li>• Possibility for reprogramming if necessary.</li> <li>• Availability of catalytic funding to boost the achievement of certain indicators and integrate activities not included in the initial package.</li> <li>• Establishment of CCM to facilitate dialogue and resolution of certain blockages in implementation.</li> </ul>	<ul style="list-style-type: none"> <li>• Absence of a transition period within the framework of the new grant architecture.</li> <li>• Reprogramming process and budget revision can slow down implementation.</li> <li>• Lack of flexibility for certain Global Fund procedures that do not always match with country procedures.</li> <li>• Reduction of the number of PRs from 7 to 4, without necessary measures to allow for a smooth transition.</li> </ul>
<b>Contextual country factors</b>	
<b>Facilitating factors</b>	<b>Hindering factors</b>
<ul style="list-style-type: none"> <li>• Government is more thorough in verifying supporting documentation to avoid their rejection.</li> <li>• Establishment of a roadmap.</li> <li>• Replacement of CT coordinator.</li> <li>• Coordination meeting in which different programs discuss grant implementation.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of fluid communication between PRs and SRs in the context of program implementation that could delay certain activities.</li> <li>• Challenges tied to expense justification.</li> <li>• PRs’ lack of mastery of Global Fund procedures.</li> <li>• New financial team at the PNT.</li> <li>• Misappropriation of funds meant for GeneXpert procurement, which weakens Senegal’s credibility.</li> <li>• Weak information reporting from the country to the Global Fund.</li> <li>• Long and inefficient country procedures.</li> </ul>

### 4.2 Root causes analysis for delays in TB/RSSH grant implementation

In addition to cross-cutting enablers and obstacles identified in the grant implementation process in general, we have also analyzed root causes relating specifically to delays in implementing the TB/RSSH grant. We have isolated four main operational challenges that contributed to bottlenecks that are summarized below and in Figure 6A of Annex 6.

**1. The funds allocated to sub-beneficiaries are not made available on time.**

- PRs and SRs are not very familiar with the financial management procedures established for the grant; the new PRs are still learning the Global Fund procedures, while the SRs must adapt to the PRs' procedures. This creates delays in allocating funds to SRs.
- The SRs do not justify their grant expenses and the PRs do not validate them in a timely manner. The expenses are often rejected by the PRs and must then be resubmitted.
- The PRs have not implemented different procedures based on SR risk levels. Until recently, SRs had to justify 80% of the previous disbursement before receiving the next disbursement. However, the PRs recently lowered the requirement to 50% to avoid bottlenecks. Nevertheless, the inability of the PRs to validate expenses in a timely manner remains a concern.

**2. Communication between the actors involved in grant management and implementation is difficult.**

- Weak cooperation between the PRs and SRs; one is strongly focused on financial controls without worrying about activity implementation, while the other must make sure activities progress.
- Turnover of stakeholders who made the initial decisions for the grant implementation of NFM2 has led to tensions between the key actors who are now in charge of implementing the new grants.
- There was only a brief transitional period to allow the new stakeholders to adapt and prepare for the new implementation arrangements, which has greatly contributed to current tensions.

**3. Long and inefficient governmental administrative procedures and related delays in decision-making.**

- Multiple entities participate in decision making (e.g. DAGE, DGS, DLM), leading to a long and inopportune decision-making process.
- Due to changes in institutional arrangements and the absence of a transition phase, the decisional structure is not clear for stakeholders.
- The government is also more vigilant in its financial management due to previous Global Fund grants with significant unauthorized expenses that had to be reimbursed.

**4. Weak inter-actor coordination.**

- Absence of a good system to identify and solve implementation bottlenecks.
- Although weekly TB/RSSH grant coordination meetings seek to resolve implementation issues, they have not been as effective as anticipated. Indeed, primary decision-makers do not attend the meetings and the participants who do have not been given the power to make decisions. Consequently, the same issues are raised every week and no clear measures are taken to resolve them.
- In order to address these challenges, the CT grant coordinator was replaced in July 2019 and a new action plan was established. It is too early to know the results of this change.

The prospective nature of the PCE allows for the CEPs to inform stakeholders of needed adjustments for improvement. During the TB-RSSH coordination meetings in 2019, the CEP had an opportunity to share RCA results, as well as recommendations. Following this, several corrective actions were taken to improve the performance of the program.

For recommendations related to TB-RSSH, some measures that were taking in 2019 included:

- The presence of ministers and other high-level individuals during coordination meetings led to more efficient and facilitated decision-making.
- Recruitment of a TB-RSSH coordinator helped address many changes. This new organization led to the development of roadmap for each program staff member and the recruitment of finance staff to reduce delays in validating supporting documents.
- Trainings specific to Global Fund procedures were established for finance staff and grant recipients. This activity, which was planned at the beginning of the grant implementation, was aimed to improve procedures for validating supporting documents.
- The Minister of Health released a memorandum making supporting documents available to avoid delays in implementation.

Following the dissemination of the PCE’s conclusions with various stakeholders (TB-RSSH, DGS, Global Fund) during the third quarter, it was decided by TB-RSSH in collaboration with the Global Fund and the MSAS, to organize an inclusive workshop from December 9-12, 2019 in Saly, with the goal of developing the Plan To Accelerate the Fight Against TB. This effort resulted in an integrated and multi-sectoral plan (PNT, PLAN, DGS, DAGE, RM, Action DAMIEN, Communities, etc.) with strong activities for 2020 but also major inputs for NFM3.

The approach initiated by certain programs to incorporate recommendations from the CEP illustrates commitment to improved implementation and a capacity for adaptation, even though variations in program responsiveness did exist.

### **4.3 Budget reprogramming**

In grant implementation, several reasons can justify execution or non-execution of certain activities. It is in this context that the NFM2 budgets allow for activity reprogramming according to their relevance, or for the introduction of new activities in coordination with the Global Fund CT. This flexibility is appreciated by most stakeholders since it allows the programs to adjust interventions during implementation.

*“For me the Global Fund’s goal is to respond to country needs so if a country realizes that a program that we design, for example in 2017, the year where we developed the proposal is no longer relevant mid-way, we have to reorient if we are not on the right path, the Global Fund understands this and now it authorizes countries to change.” (Quote from a key informant)*

ANCS activity reprogramming was completed on time and approved; this was not the case for all programs. For the TB/RSSH grant, delays in the launch led to the non-execution of several activities. Consequently, reprogramming was necessary in 2019, which took time due to delays in reviewing supporting documents, and because of a lack of mastery of Global Fund procedures. For the PNLN, non-executed activities have generated available resources nearing 1 million. Discussions between the Global Fund and PNLN regarding reprogramming were under way at the time of writing this report.

Despite positive assessments by program actors, reprogramming should not be considered a systematic or simple approach. It requires justifying the relevance of the reprogramming, based on activity reports and technical documents that are submitted to the Global Fund for approval. This approval is not automatic and requires discussions and justifications involving, among others, ministerial authorities, program actors, the CCM, the Local Fund Agent (LFA) as well as the Global Fund CT.

#### **4.4 Resilient and sustainable systems for health: Strengthening the National Health Information System**

Recognizing that the quality and availability of routine data are a major challenge for the health system, the Global Fund has supported Senegal in establishing a health information system through DHIS2. This system seeks to progressively eliminate parallel databases to use one secure and shared reference for health data. For the 2018-2020 grant period, the budget allocated to RSSH is €11,001,472, with 50% (€5,508,763) dedicated to strengthening monitoring and evaluation and health information management systems. Cross-cutting RSSH interventions are distributed throughout the three programs with the intent that each program includes a set of RSSH activities in line with their budget and avoids redundancy. It is therefore expected that each of the three programs contribute up to 10% of their allocated resources to strengthening the health information system.

Support from the Global Fund is in accordance with efforts that have been ongoing since 2014 in Senegal. Indeed, Senegal has since then resolutely engaged in using DHIS2 as a data collection platform at the health facilities level. Other funders or partners strongly engaged in strengthening DHIS2 are UNICEF, USAID and the Sight Savers NGO. Activities related to DHIS2 are training users (public sector including hospitals), supervision, configuration of data collection forms at the behest of directorates, divisions and health programs. The targeted objective is to establish a functioning and unified information system for all programs.

This support is primarily targeted at implementing activities that will lead to greater usage of DHIS2 through improved data quality, which is generally assessed on three levels: completeness, timeliness and accuracy.

**Finding 11: Despite improved completeness and timeliness of DHIS2 data, programs continue to collect and to use routine data in parallel, which puts the sustainability of the system at risk.**

*Robustness: (ranking = 1) The conclusion is corroborated by triangulation across multiple sources of data, including high-quality key informant data and evidence from document review (including dates when key grant milestones were achieved). Key informant interviews indicate a convergence of opinions across stakeholders.*

Completeness refers to the proportion of facilities that provided information on the indicator. An analysis of indicator completeness over time shows completeness was between 80% and 100% for tuberculosis, 60% and 90% for HIV. For malaria, the rate of monthly district reporting is below 40%.

As for timeliness, facility data must be completed by the fifth of the month at the latest (for the prior month). It seems that TB data has most improved compared to the others. We have compared routine data gathered by the programs with routine data from DHIS2. For malaria, beginning in 2016, the number of cases identified by routine data is nearly the same as those from DHIS2, as well for children under 5 years old and for pregnant women. The analysis in the trend of DHIS2 data compared to routine data from the tuberculosis program shows a net decrease in the gap between the two information systems, with a quite small gap remaining in 2018. This is not the case for HIV where we observe gaps between the data from DHIS2 and that from the program. This situation is even more worrying for undetectable viral load. To interpret these findings accurately, we need to better analyze if there is truly a lack of data availability to those responsible for data entry or lack of data entry altogether. Recognizing these gaps, programs are taking several steps to make DHIS2 functional, such as making program funds available to organize trainings in health facilities in charge of updating DHIS2.



For the moment, stakeholders seem to justify the non-use of DHIS2 in reporting programming progress by citing its inability to supply timely reports to meet funders' deadlines. This lack of data updates in DHIS2 further challenges the timeliness of DHIS2 information. Certain funders however disagree.

*“I never understand when they all say that the funders put pressure on them for the reports. I think there's something hiding behind it.” (Quote from a key informant)*

To better understand obstacles to DHIS2 use, we analyzed root causes (see Annex 6, figure 6A) and identified four groups of challenges: technical, financial, human and political.

**Technical challenges:** it seems that DHIS2 is considered too cumbersome from a usability point of view by some involved. Likewise, it is difficult to retrieve data from other parallel databases used by national programs in order to provide data to funders. There is perception that DHIS2 excludes community-level data, which sometimes creates frustrations with the system.

*“The problem that we have is that in DHIS2 the device is not configured to accommodate information from the community level... Our team accesses DHIS2 but we cannot enter our data because it is not configured for that, as if community data were not important.” (Quote from a key informant)*

**It should** be noted however that there has been an evolution of DHIS2 in 2019. The lack of community level data and completeness in DHIS2 was considered a barrier to its use. As part of the PCE, the CEP collected data in a progressive manner, which allowed the team to witness changes in the DHIS2. In the last interviews of the PCE for 2019, DHIS2 has improved in terms of the range of information sources including the integration of community level data and a standardization of the tool across all structures.

Another challenge to the use of DHIS2 has been the use of parallel systems. A major focus has been the interoperability of these systems. During 2019, DPRS worked with PNA and AIRIS Solutions to configure DHIS2 such that disparate data systems can upload their information to a single DHIS2 system. Data quality validation is decentralized but is not well ensured. To address this, DRPS occasional conducts sessions in the field to triangulate the findings with what is being shared by data managers. It assesses the validity of the data based on the statistical quality consistency rules.

**Financial challenges:** computers, tablets and the internet are not accessible in all peripheral zones. The lack of resources in the NFM2 grant budget for alignment meetings and data review is also limiting. Other difficulties arise such as capacity building on DHIS2 use in certain treatment centers.

**Human resource challenges:** we observe an issue of availability of staff members dedicated to data management at the health district level. The data manager is often responsible for multiple positions: they are a nurse/data manager, etc. They are overwhelmed dealing with all the programs reaching out to them for their data. Striking health workers, who boycotted activities during 2018, stopped updating the reporting system. Moreover, high turnover requires training new agents sent to the different districts.

**Policy challenges:** there is an increasingly clear political will that requires careful negotiation to encourage using DHIS2 as a national reference tool. This should help reinforce coordination and dialogue between the various funders that support DHIS2 to harmonize indicators. A codebook of indicators is currently being finalized. As such, a more engaged policy leadership could design a national strategy for the health information system, by establishing a clear

transition policy and providing a direct line of action that dictates to the programs an alignment on country indicators instead of letting the indicators multiply.

The budgetary split of RSSH across the three programs has created challenges in coordinating different actions to strengthen the health system. Few biannual meetings have been conducted on time as planned in the grant because freeing up the resources to lead these activities remains an indirect grant challenge due to the RSSH budget split.

*“The architecture was done so that all programs had to give a certain percentage of their funding. Only the TB program has given 10 percent (...) The RSSH included activities that were not funded: monitoring, implementation of the integrated package of services among others, so from the beginning there were problems.” (Quote from a key informant)*

This constitutes a major challenge since the programs themselves define, finance and execute activities regularly assigned to the Division du Système d'Information Sanitaire et Sociale (DSISS). Efforts to strengthen these activities included in the RSSH framework should see a better organization of funds, and they should be grouped within a single administrative unit that will be held accountable based on performance indicators. The data collected show that despite apparent good will, resources are disparate within programs, difficult to mobilize and hinder the functionality of cross-cutting elements that are fundamental factors for strengthening the health system in its entirety. To increase efficiency, it is therefore strongly recommended that this method of indirect granting be reconsidered in order to allow the MSAS (DSISS) to manage funds and prerogatives autonomously according to their action plan.

## **Chapter 5. Summary analysis and implications of the results for corrective action**

The grant implementation analysis shows that grant agreements with PRs were signed at the beginning of 2018 but that delays occurred in the execution of activities and in reporting. This is due to several factors including the SRs' late signing of grants and the information retention strike throughout the country. The root cause of these delays shows that difficulties in submitting supporting documentation lead to delays in later disbursements and subsequent activity implementation.

These delays necessitated further planning and reprogramming of activities. Although flexibility of reprogramming is appreciated by program managers, it can result in significant delays in program execution because it requires justifying its relevance based on activity reports and technical documents, which are submitted to the Global Fund for approval. This approval is contingent on justification results during discussions involving ministerial authorities, program actors, the CCM, the LFA as well as the Global Fund CT among others.

**Takeaway 1:** Implementation processes require monitoring by MSAS authorities and strong measures where necessary making it possible to reach compromises to facilitate effective measures for remediation (rapid submission of supporting documentation for reprogramming) to respect implementation deadlines and to facilitate country dialogue.

The joint implementation of the LLIN mass campaign between The Gambia and Senegal is a compelling example of the importance of working with neighboring countries on shared health issues. Political leaders should better support interventions that *serve as a basis for cross-border initiatives for malaria elimination*.

Nevertheless, these initiatives require coordination and sharing of responsibilities between two groups of actors: those in charge of LLIN mass campaign execution and those responsible for



strategic monitoring and evaluation. Programs should take the time to both prepare such intensive interventions and to plan for monitoring and evaluation to give themselves time to conduct activities pertaining to other aspects of their missions, which differ from LLIN mass campaigns but are just as important for malaria control.

**Takeaway 2:** Coordination between funders and establishing active communication would help lead to improved program success and targets attainment for funders. This includes action synergies between Global Fund, WHO and PMI, which should be encouraged.

Implementation of activities by the TB and HIV programs show advances in the consideration of gender (men) and key populations (prisoners) for TB. The number of confirmed TB cases has however remained relatively unchanged despite Global Fund investments, while disparities by gender, age and geography suggest potential inequalities in anti-tuberculosis care services, yet are difficult to ascertain without a prevalence study. This should motivate a prevalence study that can better reflect the actual situation.

Results show that it is important for the Government to better engage in making drugs available, including second-line drugs necessary to treat multidrug-resistant tuberculosis since the number of detected cases has likely increased between 2015 and 2018. The distribution of GeneXpert machines and the improved availability of treatment should strengthen efforts against TB.

**Takeaway 3:** For a more significant ownership of TB management, especially MDR-TB, the State first needs to define a progressive funding strategy for second-line drugs before engaging more completely on all forms.

For HIV, the CNLS and other affiliated structures (DLSI, ANCS) have strongly committed to the 90-90-90 objectives with significant results. Of the three 90s, indicators are lowest for the level of serostatus knowledge (EDS 2017: 40%), even though there has been good progress between 2016 and 2018. The second 90 (treatment) shows the best performance level, above 85% in 2018. For the third 90, the rate is around 80%, however viral load testing rates among PLHIV is around 50%. This situation can be explained by the unavailability or failure of viral load assessment machines or stock outs of necessary products or inputs. Strategies have been established to use GeneXpert machines for viral load testing in addition to TB diagnosis.

The catalytic funds made available to Senegal allowed for a better targeting of key populations. Despite this, additional support measures are necessary considering changes in the care protocol related to the intake assessments. Furthermore, the execution of activities benefiting key populations has seen major difficulties, particularly given a sociocultural context that is unfavorable to MSM issues, for example.

**Takeaway 4:** Despite strategies to accelerate the achievement of 90-90-90 and better reach key populations, it is important to update the approach with new protocol changes that align with specific population groups such as children.

These results would all benefit from being productively integrated in DHIS2, which intersects well with the RSSH section of Global Fund financing. Despite certain advances in the DPRS leadership, actions should still be taken to integrate all programs and indicators to secure data completeness and timeliness. But technical, financial, human and policy challenges identified in the RCA still need to be addressed in order for adequate progress to be achieved.

**Takeaway 5:** An efficient and resilient national health information system should help better track advances against the diseases that the Global Fund focuses on, as well as all other diseases. This requires strong national leadership, and awareness and engagement from all stakeholders.

## **Chapter 6. Results dissemination and use**

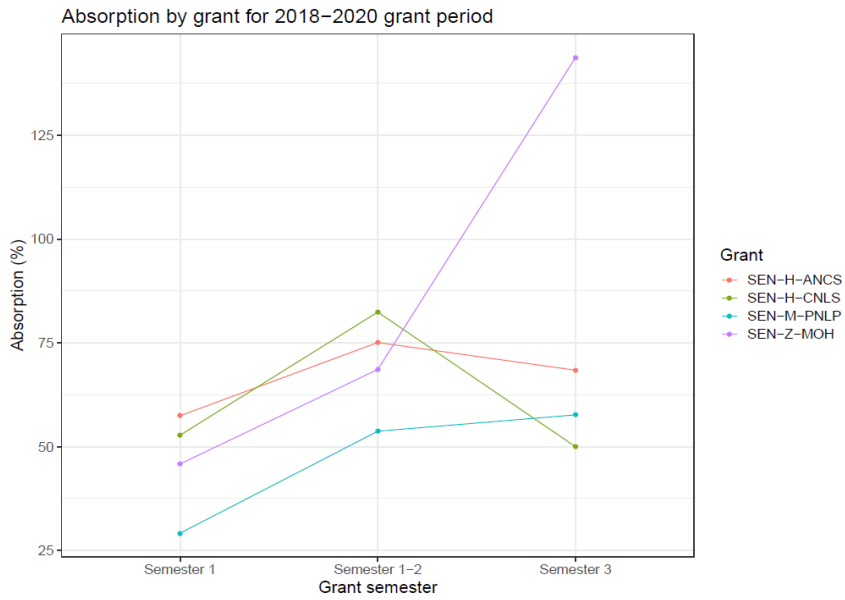
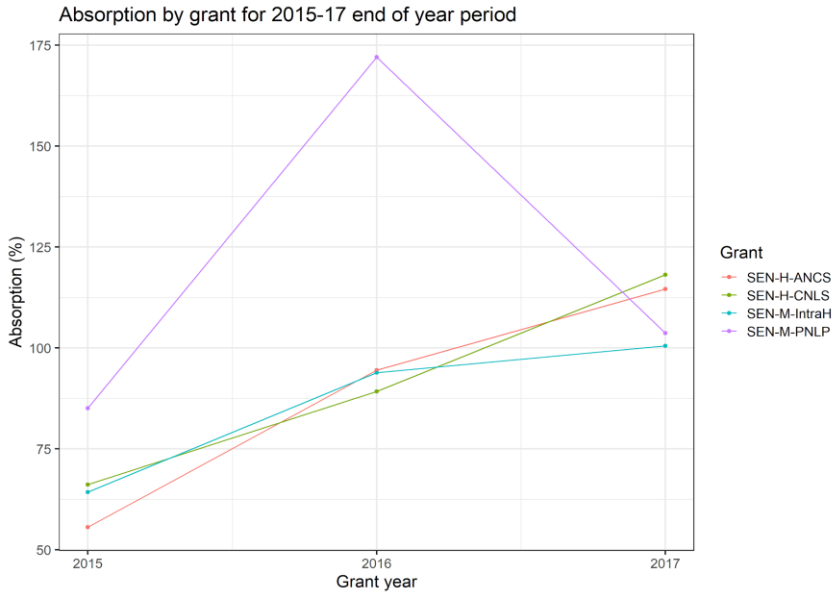
Given the PCE's primary objective to provide real-time information to programs, the team has established contact with all programs, allowing for regular sharing of results obtained through quantitative and qualitative analyses. The PCE has therefore used existing platforms such as CCM meetings which bring together representatives from the programs and civil society, as well as weekly meetings of the TB-RSSH platform which includes the DAGE and the PNT, and some weekly meetings that are open to all programs. It is worth noting that these meetings also set the stage for feedback to gather more detail in certain areas while also providing an opportunity to validate PCE results. The results are also shared with the Direction de la Lutte contre la Maladie, which is the overarching authority of these programs. The identification of numerous bottlenecks through the root cause analyses and dysfunctions between the primary actors which could justify the poor performance of the TB-RSSH program greatly contributed to the establishment of a technical committee to organize a workshop focused on identifying actions to accelerate tuberculosis control.

Numerous observed disparities by gender, age and region in the quantitative analysis strongly contributed to the decision for next TB-RSSH submission to suggest a national study on tuberculosis prevalence. Even if a national prevalence study is not possible (due to prohibitive costs and logistical criteria established by the WHO (13)), a subnational study could be useful to help guide PNT's strategy.

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# Annex 1: Absorption



**Figure 1B: Grant absorption by budget category, Jan 2018 June 2019**

Sources: PUDR

**Table 1 A: Expenses per year**

	A	B	C	D	E	F	G
1	Disease	2015 Budget	2015 Expenditure	2016 Budget	2016 Expenditure	2017 Budget	2017 Expenditure
2	HIV	€ 13,179,458.00	€ 9,083,921.00	€ 8,127,536.00	€ 7,263,726.00	€ 8,816,870.00	€ 11,013,425.00
3	Malaria	€ 21,502,941.00	€ 18,364,291.00	€ 9,103,586.00	€ 10,209,845.00	€ 2,772,731.00	€ 3,755,269.00
4	RSSH	€ 7,439,673.00	€ 5,363,541.00	€ 13,130,009.00	€ 6,779,416.00	€ 7,763,771.00	€ 9,018,575.00
5	TB	€ 2,421,091.00	€ 1,820,318.00	€ 6,351,077.00	€ 2,289,441.00	€ 2,884,999.00	€ 3,144,200.00
5							

Sources: Grant budgets

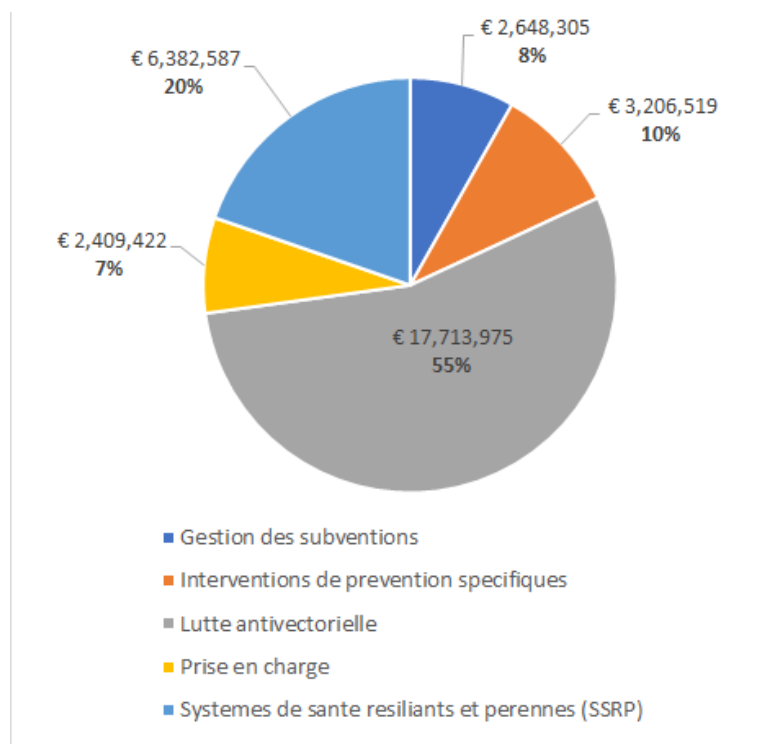
## Annex 2: Malaria

**Table 2 A: Evolution over time of LLIN use by brand - LLIN durability study in Senegal, 2015-2018**

Marque de MILDA	Utilisation de la MILDA la nuit ayant précédé l'enquête								
	6 mois		1 an		2 ans		3 ans		p value
	n, %	IC95%	n, %	IC95%	n, %	IC95%	n, %	IC95%	
Permanet rectangulaire (N=283)	233 (82,3)	77,4 - 86,6	162 (57,2)	51,2 - 63,1	51 (18,0)	13,7 - 23,0	9 (3,2)	1,5 - 5,9	0,0001
Permanet circulaire (N=287)	246 (85,7)	81,1 - 89,5	188 (65,5)	59,7 - 71,0	88 (30,6)	25,4 - 36,3	26 (9,0)	6,0-13,0	0,0001
NetProtect (N=287)	217 (75,6)	70,2 - 80,5	150 (52,3)	46,3-58,2	37 (12,9)	9,2 - 17,3	02 (0,7)	0,08-2,5	0,0001
Intereceptor (N=268)	243 (90,7)	86,5 - 93,8	167 (65,6)	56,2 - 68,1	78 (29,1)	23,7 - 34,9	16 (6,0)	3,4 - 9,5	0,0001
Olyset (N=291)	231 (79,4)	74,2 - 83,9	147 (50,5)	44,6 - 56,4	30 (10,3)	7,1 - 14,4	02 (0,7)	0,08-2,5	0,0001
Magnet (N=229)	153 (66,8)	60,3 - 72,9	112 (48,9)	42,3 - 55,6	24 (10,5)	6,8 - 15,2	00	--	0,0001
Bayer (N=258)	242 (93,8)	90,1 - 96,4	151 (52,3)	52,3 - 64,6	51 (15,1)	15,1 - 25,1	08 (3,1)	1,3 - 6,0	0,0001
Yorkool (N=256)	246 (96,1)	92,9 - 98,1	147 (57,4)	51,1 - 63,5	25 (9,7)	6,4 - 14,1	03 (1,2)	0,2 - 3,4	0,0001

Sources: EDS 2017

**Figure 2 A: Allocation of PNLP budget**



Sources: Global Fund malaria grant budget

**Table 2 B: Initial planning for LLIN mass campaign and actual distribution period**

Focus	Targeted areas	Initially scheduled distribution period	Distribution period
South, southeast	Kédougou, Kolda, Tambacounda, Sédhiou, Ziguinchor.	March-April 2019	May-June 2019
Center	Kaffrine, Kaolack, Fatick, Diourbel	March-April 2019	
North	Saint Louis, Matam, Louga	May-June 2019	July-August 2019
West	Dakar, Thiés	June-July 2019	

Source: PNLP

**Table 2 C: LLIN distribution by the PNLP during the 2019 mass campaign**

Target for LLIN mass campaign 2019	Phase 1		Phase 2		National	
	Distributed	Target achievement (CI 95%)	Distributed	Target achievement (CI 95%)	Distributed	Target achievement (CI 95%)
<b>9,907,339</b>	4,493,455	49.9% (49.8-50.1)	4,053,416	45% (44.9 - 45.1)	8,546,871	86.26% (86.21 - 86.32)

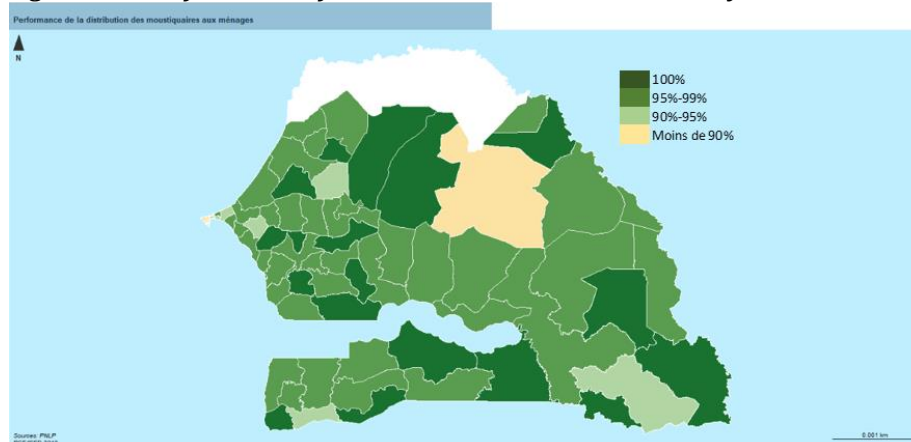
Source: 2019 LLIN mass campaign, PNLP

**Table 2 D: Analysis of LLIN distribution performance by distribution phase**

	Overall (N=72)	Phase 1 (N=40)	Phase 2 (N=32)	p value
<b>Percent of households having received a mosquito net (CI 95%)</b>	96.3%. (95.0 - 97.6)	98.2%. (97.6 - 98.9)	93.9%. (91.3 - 96.5)	0.0005
<b>Difference in distributed LLIN, validated LLIN need (mean, CI 95%)</b>	123,005 (100,579 - 145,431)	113,831 (79,304 - 148,358)	134,473 (106,658 - 162,287)	0.36

\*Source: PNLP

**Figure 2 B: Performance of LLIN distribution in households by health district**



Source: 2019 LLIN mass campaign, PNL/P

**Table 2 E: Analysis of LLIN coverage performance by distribution phase**

	<b>Overall</b>	<b>Phase 1 (with The Gambia)</b>	<b>Phase 2</b>	<b>p value***</b>
<b>Ratio number of persons per LLIN (mean, CI 95%)</b>	2.1 (2.0 - 2.2)	2.0 (1.9 - 2.1)	2.3 (2.2 - 2.4)	.0001
<b>Proportion of health districts with a correct person/LLIN ratio (CI 95%)</b>	23.6%. (15.0 - 35.0)	37.5%. (22.5 - 52.5)	6.3%. (2.1 - 14.6)	.002
<b>LLIN coverage of habitual sleeping spaces (mean, CI 95%)</b>	80.2 (78.3 - 82.2)	84.5 (82.7 - 86.3)	74.9 (72.0 - 77.8)	.0000
<b>Proportion of health districts with a correct LLIN / habitual sleeping space ratio **(CI 95%)</b>	55.6%. (43.8 - 67.3)	77.5%. (64.0 - 91.0)	28.1%. (11.7 - 44.6)	.0000

\*The person/LLIN ratio is correct if between 1.8 and 2

\*\*The LLIN/habitual sleeping space ratio is correct if between 0.8 and 1

\*\*\* P value comparing phase 1 versus phase 2 – Source: PNL/P.

Source: 2019 LLIN mass campaign, PNL/P



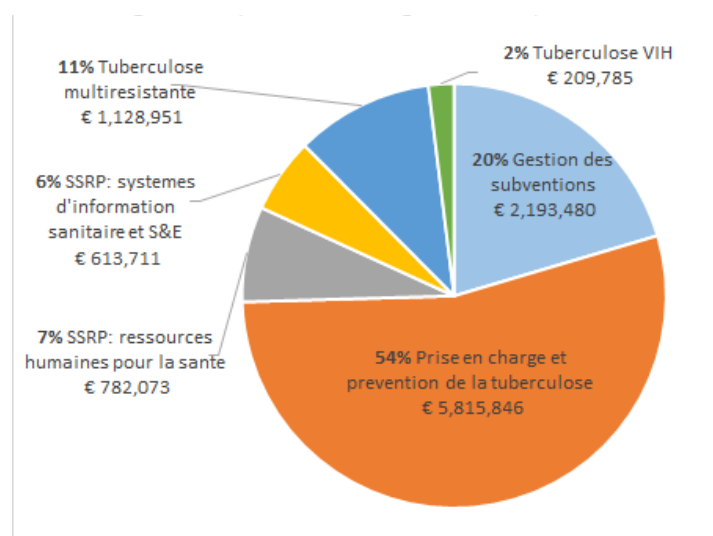
## Appendix 3: Tuberculosis

*Table 3 A: Cases detected, availability of GeneXpert and machine use*

REGION	TB Cases all forms	Total GeneXpert tests conducted	GeneXpert use	Number of GeneXpert machines
DAKAR	5,993	680	11%	5
DIOURBEL	1,500	86	6%	1
FATICK	342	24	7%	2
KOLDA	367	60	16%	1
SEDHIOU	294	21	7%	1
KAFFRINE	242	26	11%	1
KAOLACK	594	42	7%	1
LOUGA	490	25	5%	1
MATAM	232	10	4%	1
ST-LOUIS	638	47	7%	1
TAMBACOUNDA	259	11	4%	1
KEDOUGOU	76	3	4%	1
THIES	1,938	198	10%	1
ZIGUINCHOR	695	70	10%	1
<b>SENEGAL</b>	<b>13,660</b>	<b>1,303</b>	<b>10%</b>	<b>14</b>

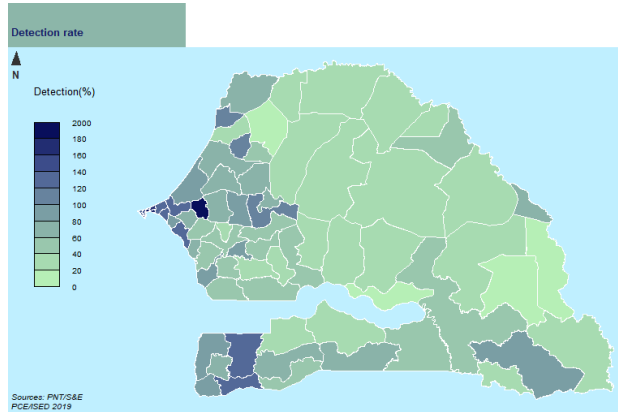
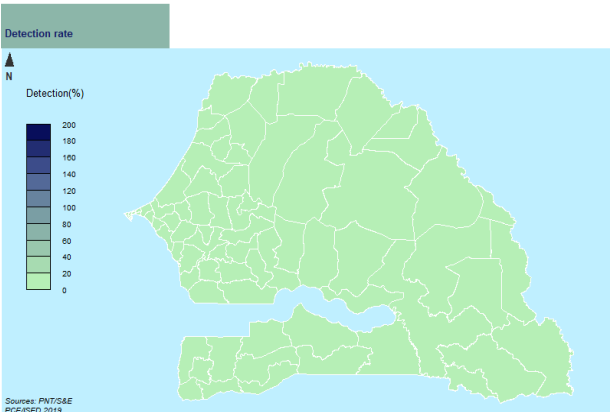
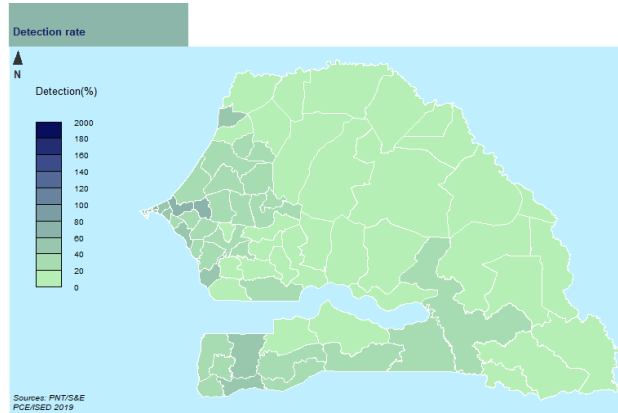
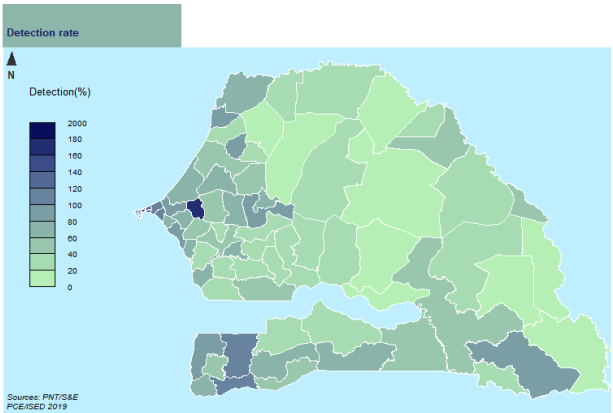
Source: PNT

*Figure 3 A: Distribution of TB/RSSH budget by module*



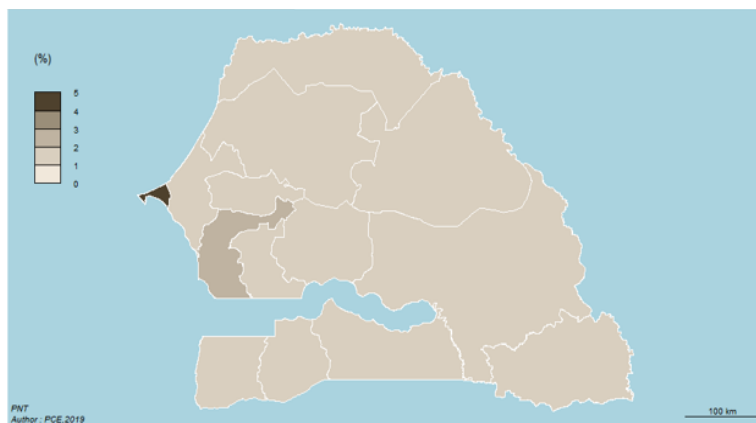
Source: Global Fund grant budget

**Figure 3 B: Gender and tuberculosis detection**



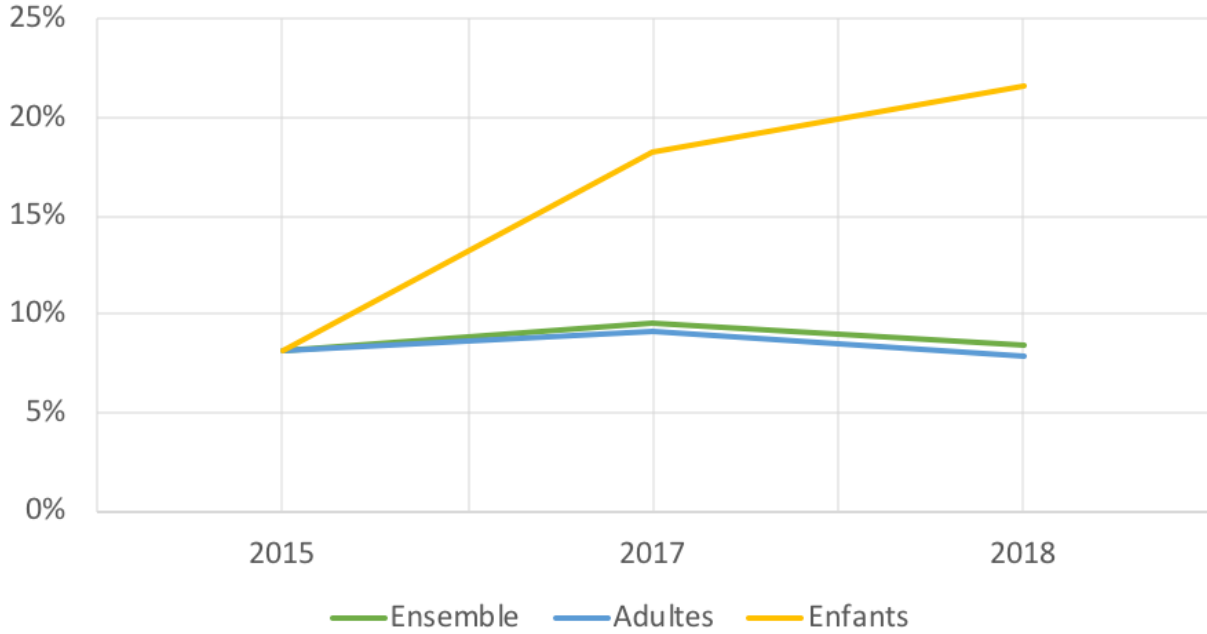
Source: PNT, routine data

**Figure 3 C: Availability of GeneXpert machines**



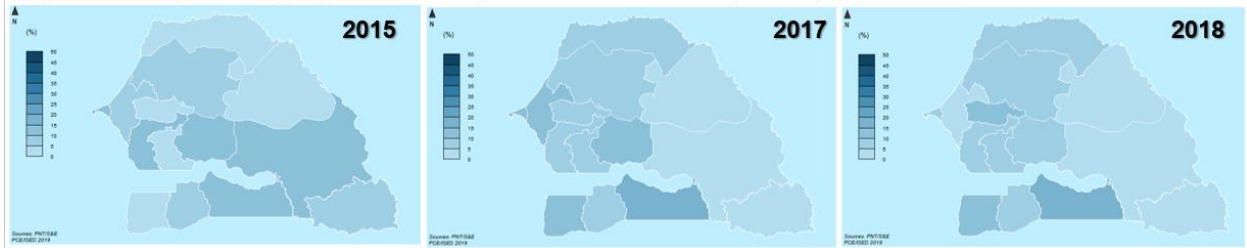
Source: PNT, Mapping of tools 2017

**Figure 3 D: Use of GeneXpert machines by region, 2015-2018 (% of cases detected with GeneXpert)**



Source: PNT, routine data

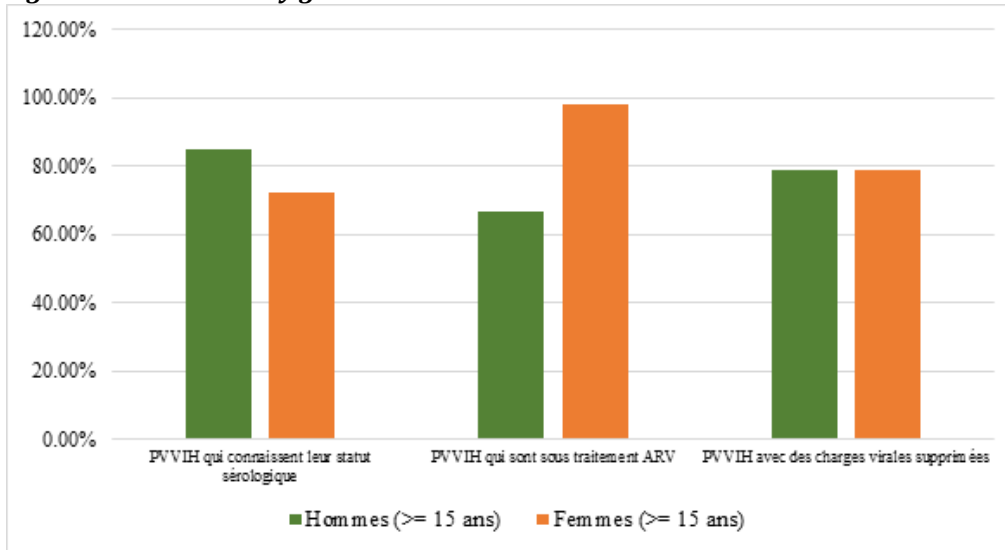
**Figure 3 E: Evolution of proportion of persons tested with GeneXpert by region**



Source: PNT, routine data

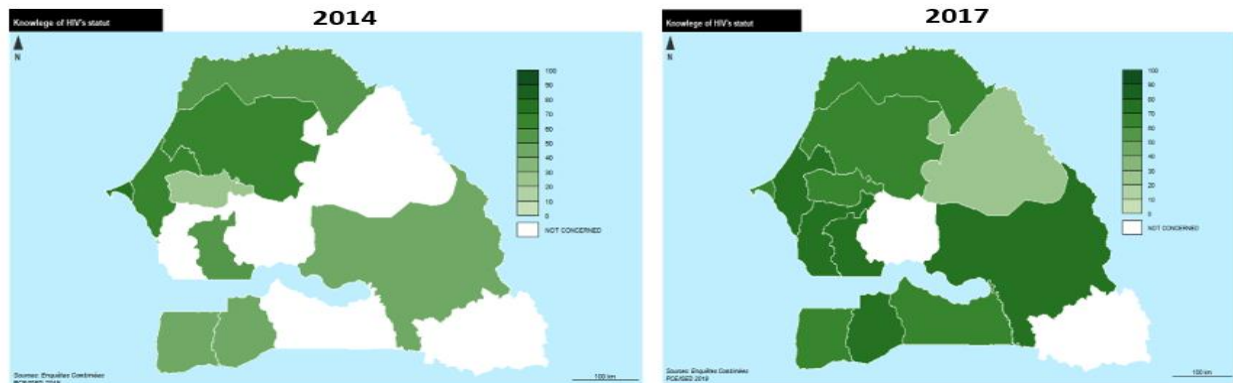
## Appendix 4: HIV

**Figure 4 A: Three 90s by gender**



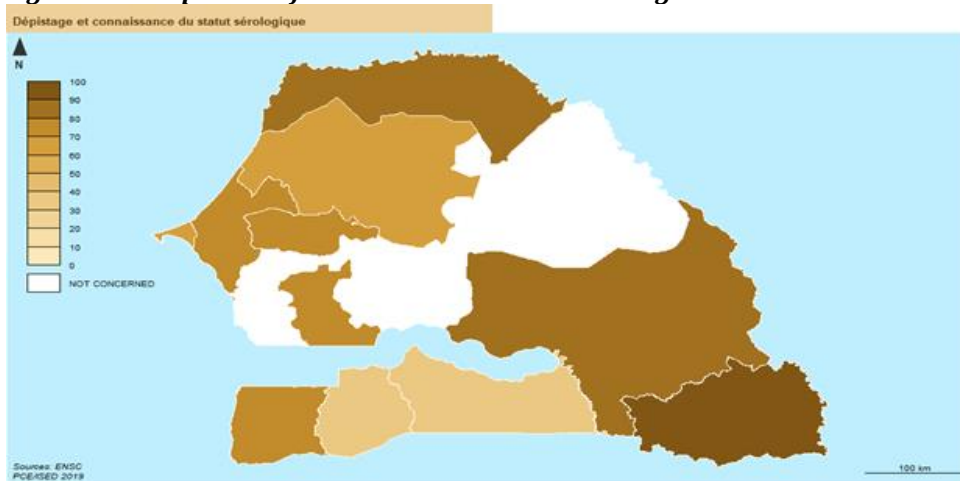
Source: CNLS, routine data

**Figure 4 B: Proportion of MSM who have done a screening test and have received their results**



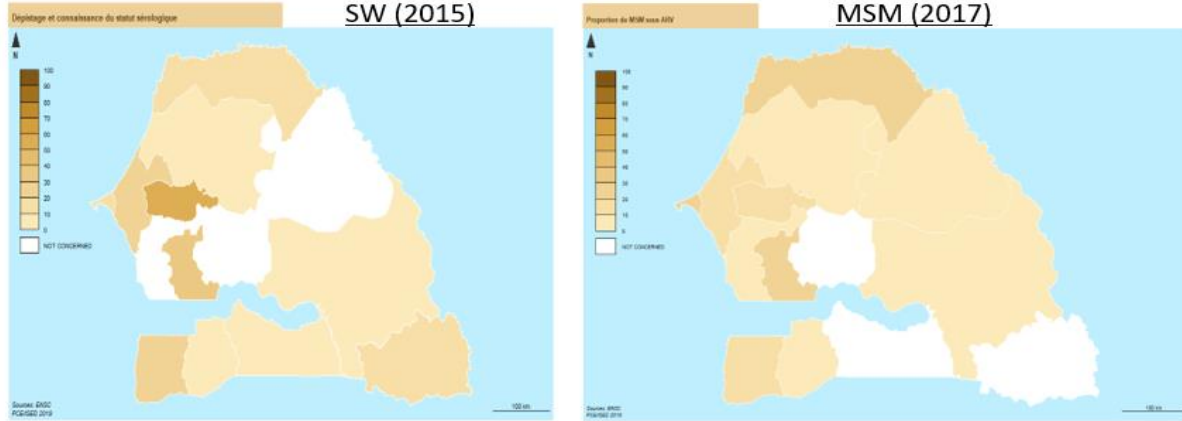
Source: National combined surveillance survey on MSM

**Figure 4 C: Proportion of SW who have done a screening test and have received their results by region**



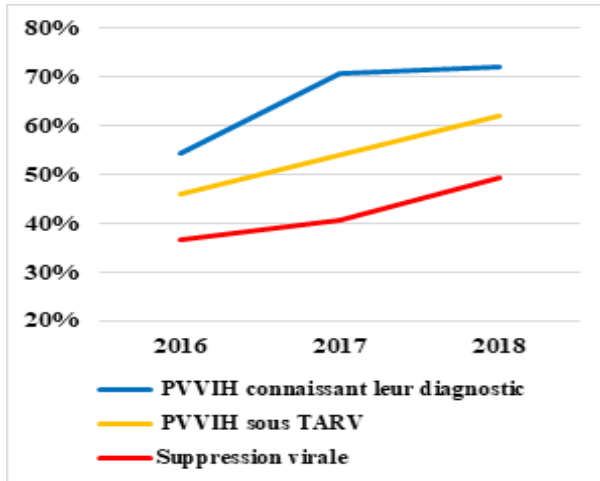
Source: National combined surveillance survey on SW

**Figure 4 D: Proportion of key and vulnerable populations undergoing ARV**

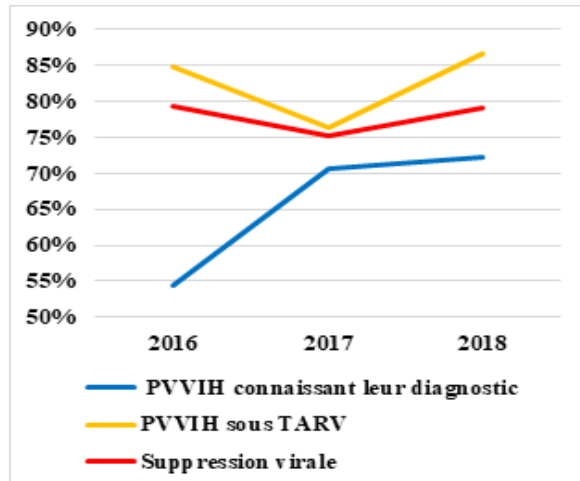


Source: National combined surveillance survey

**Figure 4 F: Evolution of the care cascade**



**Figure 4 E: Evolution of the 90-90-90 cascade**



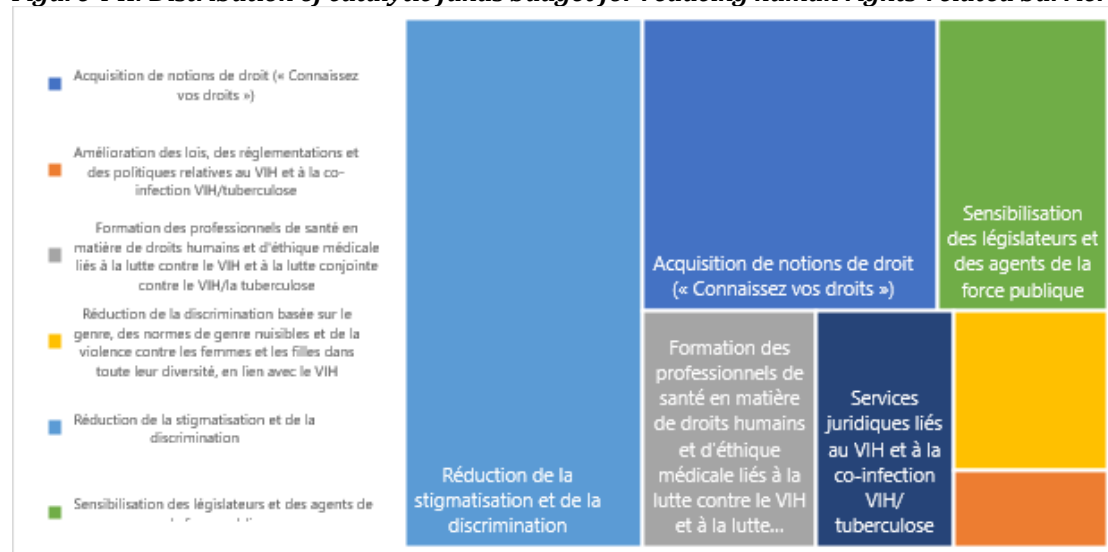
Source: CNLS, routine data

**Figure 4 G: Availability of viral load equipment**



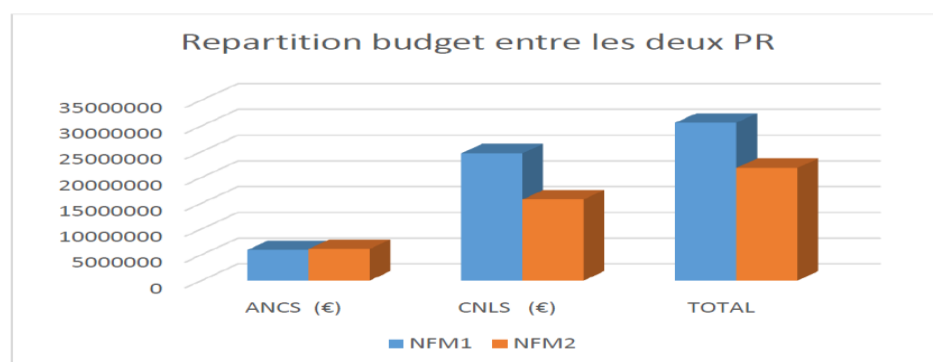
Source: NACC

**Figure 4 H: Distribution of catalytic funds budget for reducing human rights-related barriers**



Source: HIV grant budgets

**Figure 4 I: Distribution of budget between the two PR (HIV)**



Source: HIV grant budgets

**Table 4 A: Distribution of CNLS budget by module - NMF2**

MODULES	Budget	%
Complete prevention programs for sex workers and their clients	236,944	1%
Complete prevention programs for people who inject drugs and their partners	902,240	5%
Prevention programs for other vulnerable populations	1,052,435,550	6%
Prevention programs for teens and youth, in school or not	186,418	1%
PMTCT	649,089	4%
Treatment, care and support	7,692,853	46%
TB/HIV	326,704	2%
RSSH: Integrated service delivery and quality improvement	1,183,073	7%
RSSH: Health management information systems and M&E	1,012,007	6%
Program management	2,615,585	16%
Complete prevention programs for MSM	540,156	3%
Supply chain systems	114,337	1%
Programs for reducing human rights-related barriers that hinder access to HIV services	284,528	2%
<b>TOTAL</b>	<b>16,796,370</b>	<b>100%</b>

Source: CNLS HIV grant budgets

**Table 4 B: Distribution of ANCS budget by module - NFM2**

<b>MODULES</b>	<b>Budget</b>	<b>%</b>
Complete prevention programs for men who have sex with men (MSM)	658,479	9%
Grant management	2,359,553	33%
Complete prevention programs for sex workers and their clients	650,059	9%
Resilient and sustainable systems for health: health information management system and monitoring and evaluation	464,724	7%
Complete prevention programs for people who inject drugs and their partners	257,280	4%
Prevention programs for other vulnerable populations	483,107	7%
Prevention programs for the general population	50,308	1%
Prevention of mother-to-child transmission (PMTCT)	216,596	3%
Programs for reducing human rights-related barriers that hinder access to HIV services	717,708	10%
Treatment, management and support	734,855	10%
Resilient and sustainable systems for health: community responses and systems	448,961	6%
TB/HIV	101,272	1%
<b>TOTAL</b>	<b>71429061</b>	<b>100%</b>

Source: ANCS HIV grant budgets



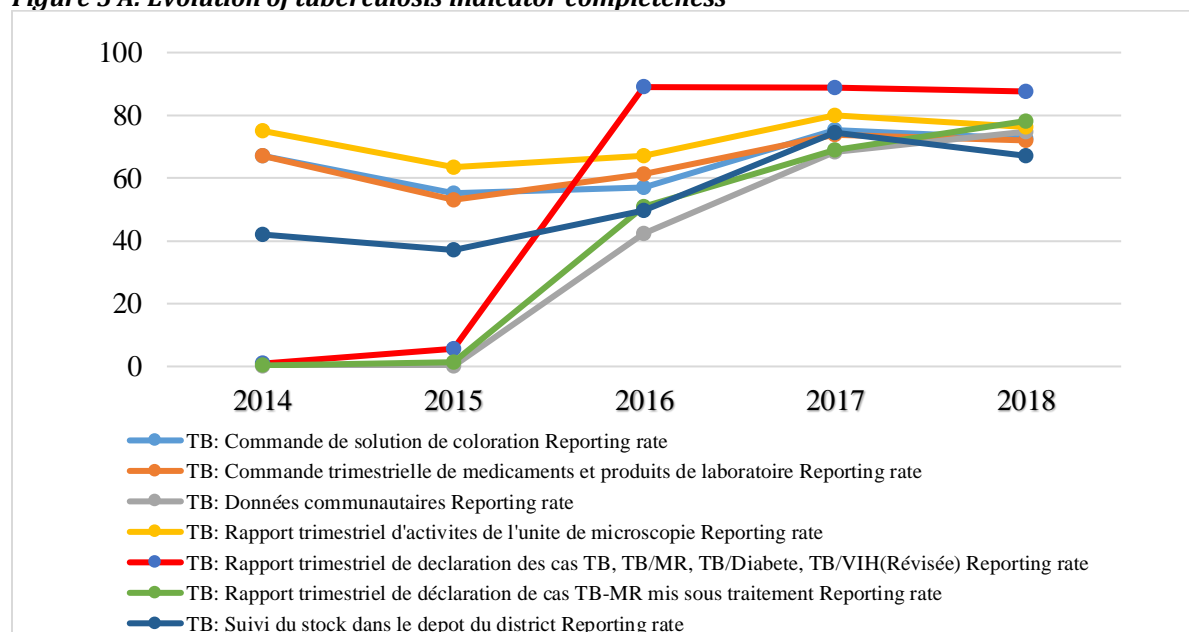
## Annex 5: TB/RSSH

**Table 5 A: Distribution of the RSSH budget in the Global Fund grant**

Programs	Budget total (€)	RSSH (€)	RSSH weight
MALARIA	32,360,808	6,382,587	12,8%
TUBERCULOSIS	10,743,845	1,395,783	14%.
HIV (CNLS)	16,796,371	2,309,416	19,7%
HIV (ANCS)	7,142,905	913,685	13%
<b>Total</b>	<b>67,043,929</b>	<b>11,001,472</b>	<b>16,4%</b>

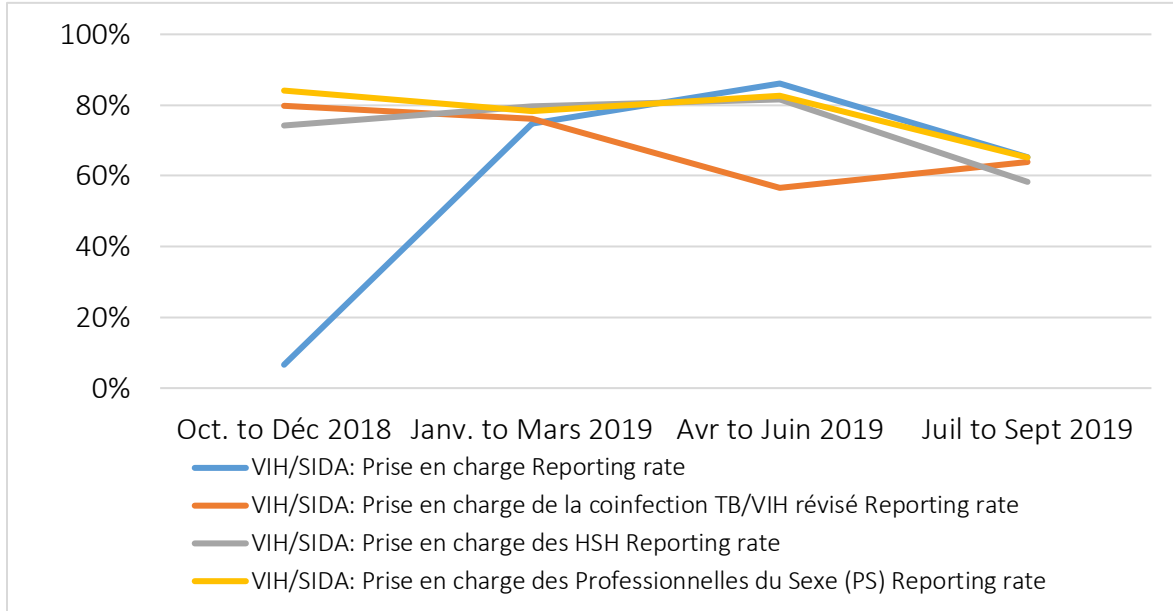
Source: Global Fund grant budgets

**Figure 5 A: Evolution of tuberculosis indicator completeness**



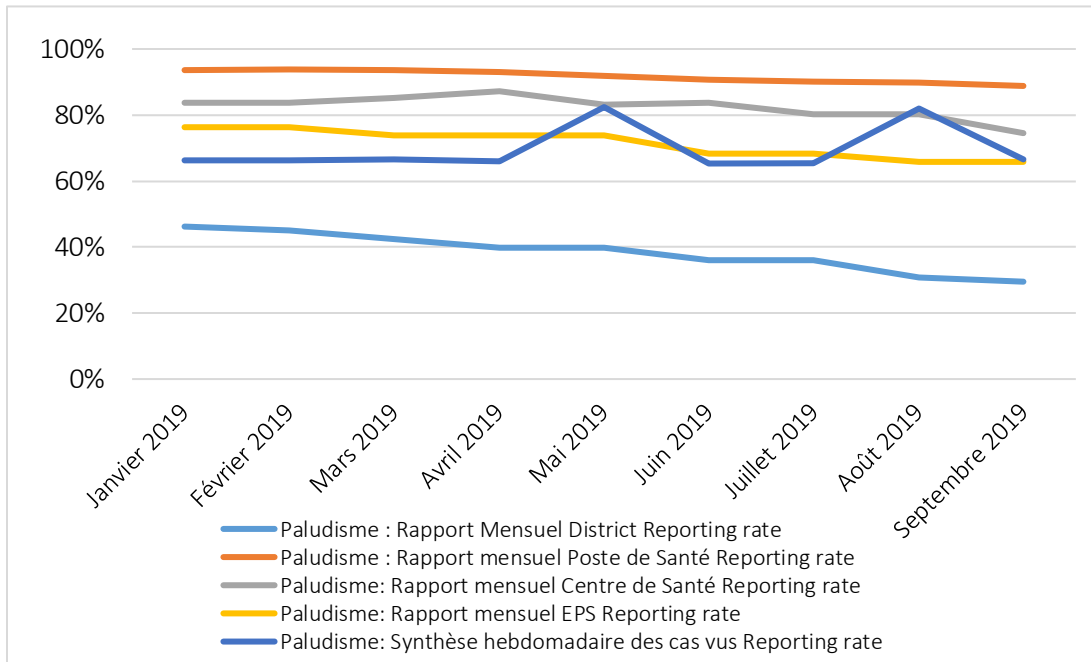
Source: DHIS2

**Figure 5 B: Evolution of HIV indicator completeness**



Source: DHIS2

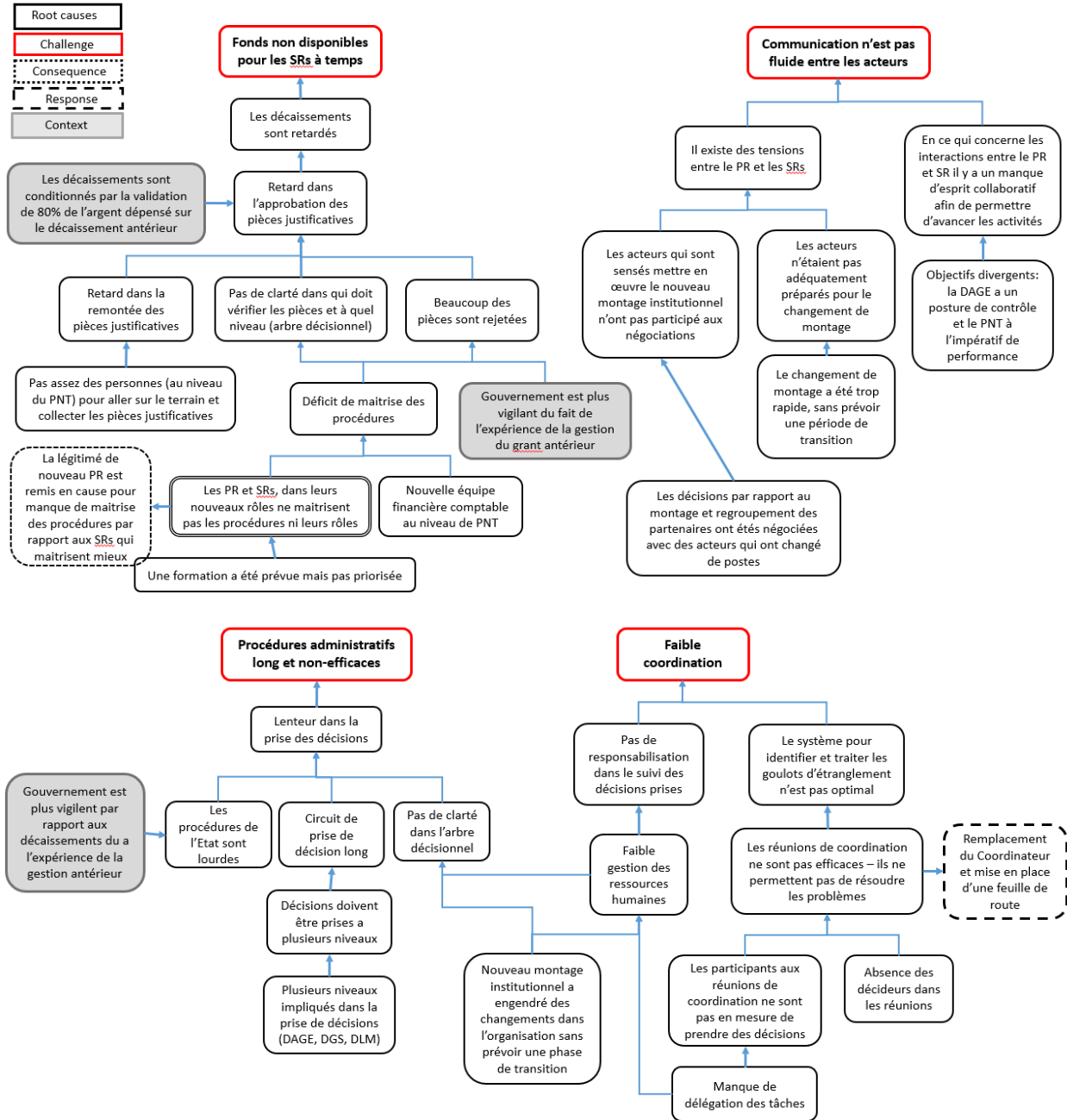
**Figure 5 C: Evolution of malaria indicator completeness**



Source: DHIS2

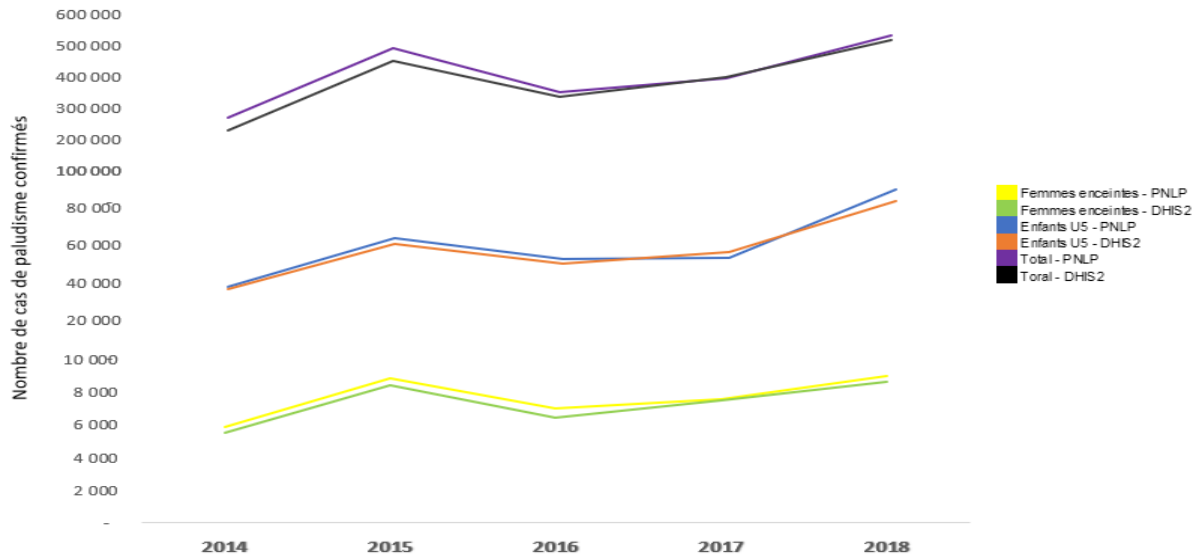
# Annex 6: Facilitateurs et obstacles transversaux à la mise en œuvre des subventions

Figure 6 A : Analyse de cause fondamentales sur les retards dans la mise en oeuvre de la subvention TB/RSSH



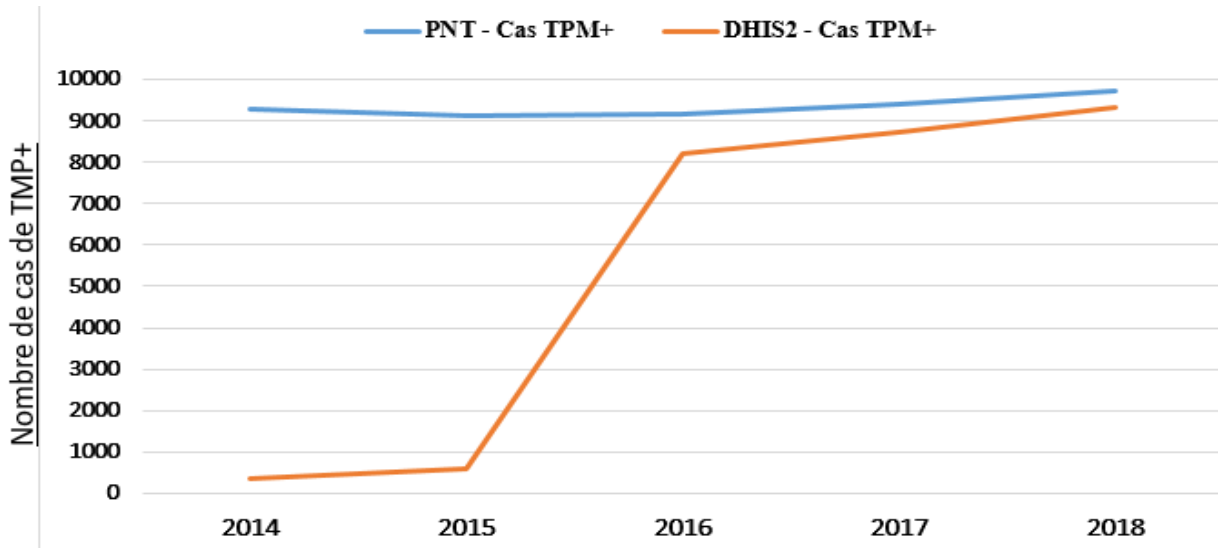
## Annex 7 : RSSH/DHIS2

Figure 7 A: Evolution of routine data compared to DHIS2 (malaria)



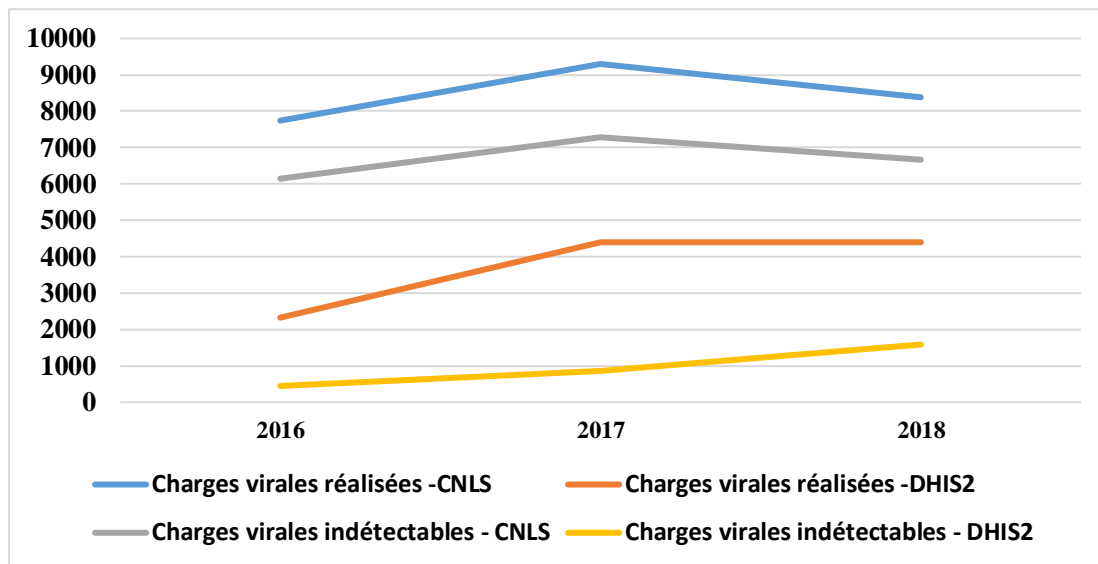
Source: DHIS2 & PNL routine data

Figure 7 B: Evolution of routine data compared to DHIS2 (tuberculosis)



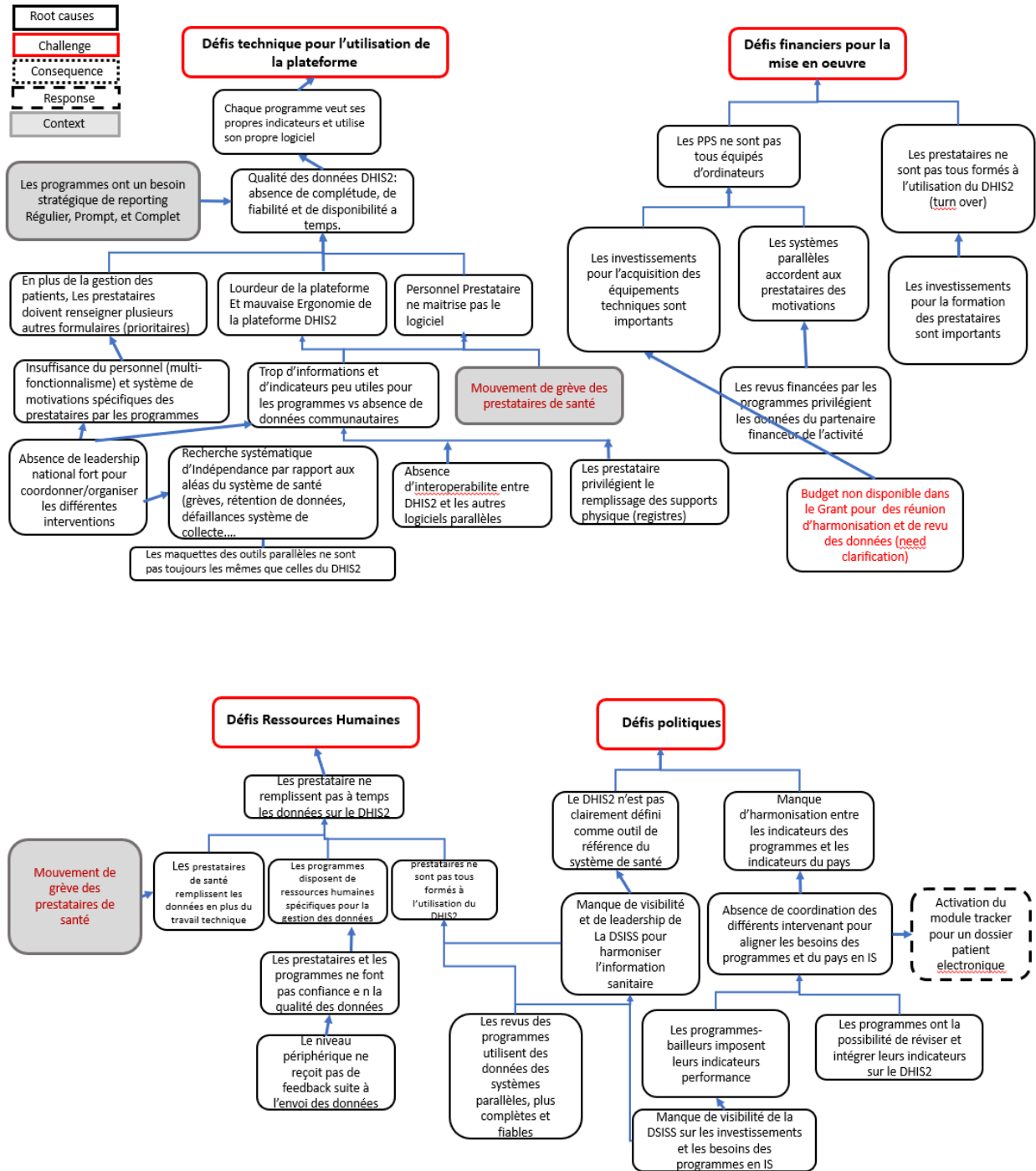
Source: DHIS2 & PNT routine data

Figure 7 C: Evolution of routine data compared to DHIS2 (HIV)



Source: DHIS2 & CNLS routine data

Figure 7 D : Analyse de cause fondamentales sur la non utilisation du DHIS2 comme outil de référence



## **Annex 8: TB Health Systems Model**

### **Part 1. Methods**

#### **Health System Modelling Methodological Appendix**

##### **Background**

The PCE developed a novel evaluation tool referred to as a Health Systems Model. While the concept of Health Systems Modelling (HSM) has been established in the academic literature (14), it has not to our knowledge been applied as part of a prospective evaluation. The PCE has applied HSM in five instances now, and used it to serve several simultaneous purposes:

- Identification of potential bottlenecks in program implementation
- Statistical measurement of technical efficiency, defined as activity or output per dollar
- Statistical measurement of implementation effectiveness, defined as the translation of outputs to outcomes
- Examination of subnational patterns in implementation effectiveness
- Counterfactual analysis of impact, defined as the expected level of incidence and mortality under a certain level of financial input

In Senegal, HSM was used to explore several of these topics for TB.

The HSM approach adopted by the PCE has been less methodologically robust than the HSM approaches defined in academic literature. This was motivated by the prospective and use-focused nature of the PCE itself, as well as the multiple, competing objectives of the PCE. As such, several important model limitations (data quality limitations notwithstanding) must be noted and are described below. The purpose of HSM in the PCE is to serve as one of many tools to learn about how grants contribute to the national programs and to lend evidence-based guidance to other evaluation approaches. Thus, the HSM should not be seen as a stand-alone product, but rather a component of a larger evaluation product.

##### **Results Chain Conceptual Framework**

Before applying any statistical models, the PCE first developed a theoretical model of how health systems in each country translate financial and other inputs into health outcomes. Using an interactive online tool (15), the PCE drew from its diverse group of in-country and international experts to diagram the “results chain”, or sequence of related pathways by which inputs become activities, activities become outputs, outputs become outcomes and outcomes become impact. This framework detailed both the theoretical constructs along each pathway as well as lists of potentially-measurable indicators within each construct. One framework was developed for each of the three diseases (HIV, TB and malaria) and was reviewed and validated by experts from all eight PCE country evaluation partners, by the five global evaluation partners and select members of the Global Fund. Results chain development was conducted in a series of in-person workshops and subsequent online collaboration.

##### **Data Sources**

Once the conceptual frameworks were developed, the PCE teams collated data from all available sources in order to “populate” as many elements of the results chain with empirical indicators as possible. A separate exercise was carried out in each country to map data sources to indicators in the results chains.

Based on data access, availability, completeness, quality and feasibility, five cases were selected to pilot HSM: malaria in the Democratic Republic of the Congo (DRC), TB in Guatemala, TB in Senegal, HIV in Cambodia and HIV in Mozambique.



The models have varied in specific data sources, but generally rely on Global Fund data systems to track expenditure of Global Fund investments, OECD data systems to track expenditure of other donor investments, national health accounts to track government expenditure and national program data to track health systems activities, outputs and outcomes. A complete list of indicators and data sources for Senegal is provided below.

### **Data Processing**

Several data processing steps were carried out in order to a) ensure standardization of indicators to enable modelling and b) correct for known data quality limitations.

All indicators were extracted from their original data system (excel spreadsheets, online dashboards etc) using standardized scripts written in the R statistical programming language to ensure reproducibility. In some cases, indicators were available at different levels of geographic and temporal aggregation (for example, “Nombre d'enfants contact référés” was available by year and region, but “Total des cas de tuberculose identifiés et traités” was available by quarter and district). After identifying all available indicators, modelling teams determined the most granular level of aggregation that was possible for a majority of indicators. Where necessary, indicators were then aggregated or disaggregated to that level. To disaggregate by geography, indicators were divided in proportion to the subsequent indicator in the results chain.

All data were then systematically corrected for missing values and outliers. We used visual examination and to screen for extreme values and a combination of the expectation-maximization algorithm and generalized linear models to impute missing values (including those created by outlier screening) (16).

Data transformations were applied prior to fitting each model. All rate variables were log-transformed and all proportion variables were logit-transformed to ensure univariate-normal distributions. Count variables were cumulative-summed over their available time series (starting from the first date in their time series, even if other indicators were only available for a shorter time frame) to more accurately reflect financial processes according to theory. Six-month time lags were applied to each financial variable to ensure a more realistic temporal relationship between inputs and activities, and six-month leads were applied to treatment success variables to ensure a more realistic temporal relationship between treatment initiation and completion.

Additional corrections were applied specifically for Senegal. Investment in health system strengthening by the Global Fund was added to direct intervention investment to account for the sizable contribution of the Global Fund to RSSH. This was allocated proportionally to the size of each module-specific spend by quarter.

### **Statistical Methods**

Structural equation modelling was selected as the primary statistical method. A simplified approach was employed in Senegal due to sample size constraints in the data and time constraints in the PCE work plan. To simplify the structural equation model, we used independent generalized linear models (GLM), fitting each equation in the overall system of equations separately. Region “fixed effects” were employed across the entire model (i.e. model coefficients were estimated for every region; national graphs represent the average coefficient) to control for geographical confounding.

In all, the model amounted to a system of 16 regression equations. For example, a single equation from the model might be:

*Number of GeneXpert tests conducted\_it ~ Global Fund expenditure on case detection and diagnosis\_it + other donor expenditure on case detection and diagnosis\_it + Global Fund expenditure on MDR-TB\_it + other donor expenditure on MDR-TB\_it*

Where the above indicators are measured for each region (i) and quarter (t). Regression coefficients were expressed on a z-standardized scale, thereby reflecting the expected standard deviation change in a particular outcome variable associated with a one standard deviation change in a particular explanatory variable.

### **Model Limitations**

As mentioned above, there are several methodological limitations to the HSM approach used in the PCE, the most noteworthy of which (though not necessarily all) are listed here. Each of the below issues limit the validity with which our HSM reflects the “true” results chain.

**Static model:** The structural equation modelling approach selected for this analysis does not incorporate dynamic effects of any explanatory variable on its subsequent outcome variable. In other words, each coefficient is estimated as an average across the time series of available data and is assumed to be constant over time. In addition, no features were added to the model to account for the reality of declining marginal returns associated with approaching saturated coverage of certain interventions.

**Generalized linear model:** Due to sample size and time constraints, the HSM was simplified by using GLM instead of the more statistically-robust structural equation modelling. This means that changes to one variable can only affect coefficients in the single equation in which that variable is fit, and cannot propagate through the rest of the results chain. It also limits our ability to include non-directional correlations between variables in separate equations.

**Simplification of conceptual framework:** As described above, the PCE team developed a theoretical conceptual framework of the results chain, detailing all relevant constructs and indicators involved in national programs. Due to data availability, and for the purposes of feasibly developing a model in a timely manner, many of the indicators in the theoretical model were not included in the statistical model. In some instances, this may have led to important gaps between adjacent indicators, leaving some pathways only superficially-represented

**Uniform lagged effects:** As described above, the PCE implemented 6-month lags between expenditure and activities/outputs, and 6-month lags between outcomes and treatment success rates (where relevant). The purpose of this is to more realistically reflect the time delays inherent to national programs and treatment regimens, but it is necessarily a simplification. In reality, there may be variable lags depending on the intervention, geography or other factors, but this model assumed constant lag terms throughout.

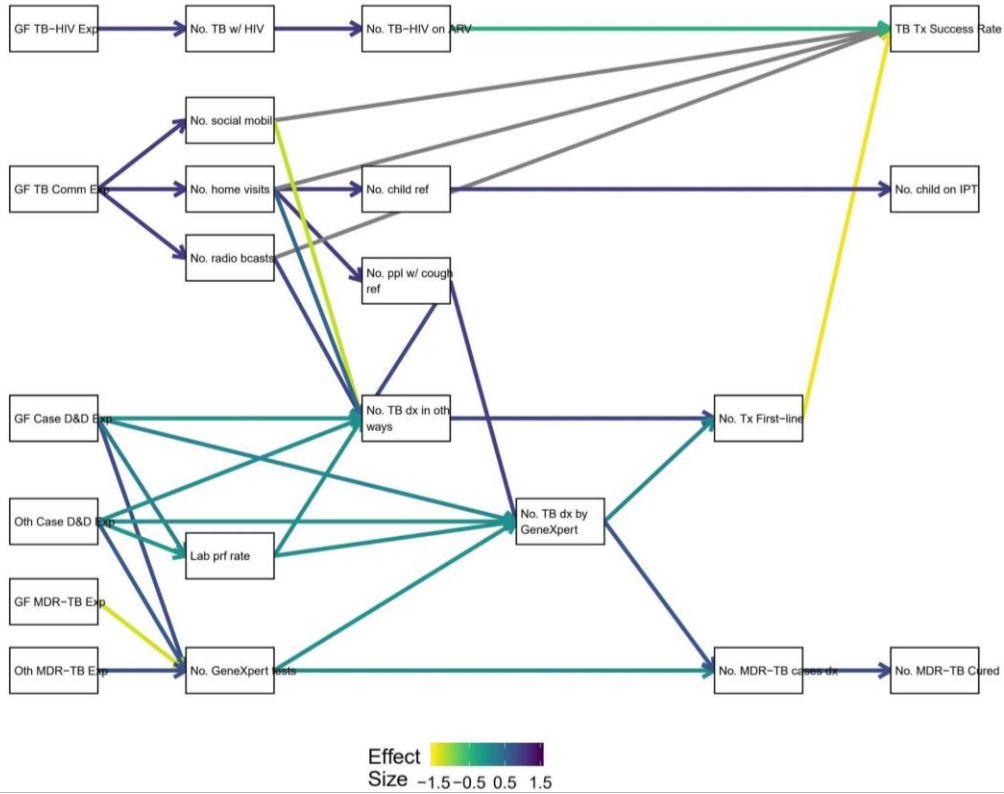
**Level of disaggregation:** Most of the financial inputs variables have been aggregated for the purposes of feasibility and interpretability of the model results. For example, all MDR-TB expenditures were summed together to form a single variable in the model, when in reality this “module” in the Global Fund and other budgets is comprised of many separate activities. Furthermore, data availability constraints led us to exclude government health expenditure altogether.

**Sociodemographic confounding:** Many -possibly innumerable- factors from outside of the health system (health behavior, access to services, perceptions, economic conditions etc.) are not reflected in this model. While many linkages, such as the linkage between supply chain shipment of a commodity and in-facility utilization of it, may be assumed to be unaffected by changes in sociodemographic variables, others, such as the linkage between coverage of services and changes in burden of disease, are inarguably confounded. This limits our ability to reliably measure those aspects of the results chain. Importantly this pertains to the final linkage between outcomes and impact in the results chain. Without further theory-development, data and modelling, the PCE elected to exclude this final linkage from the model.

## Part 2. Description of data

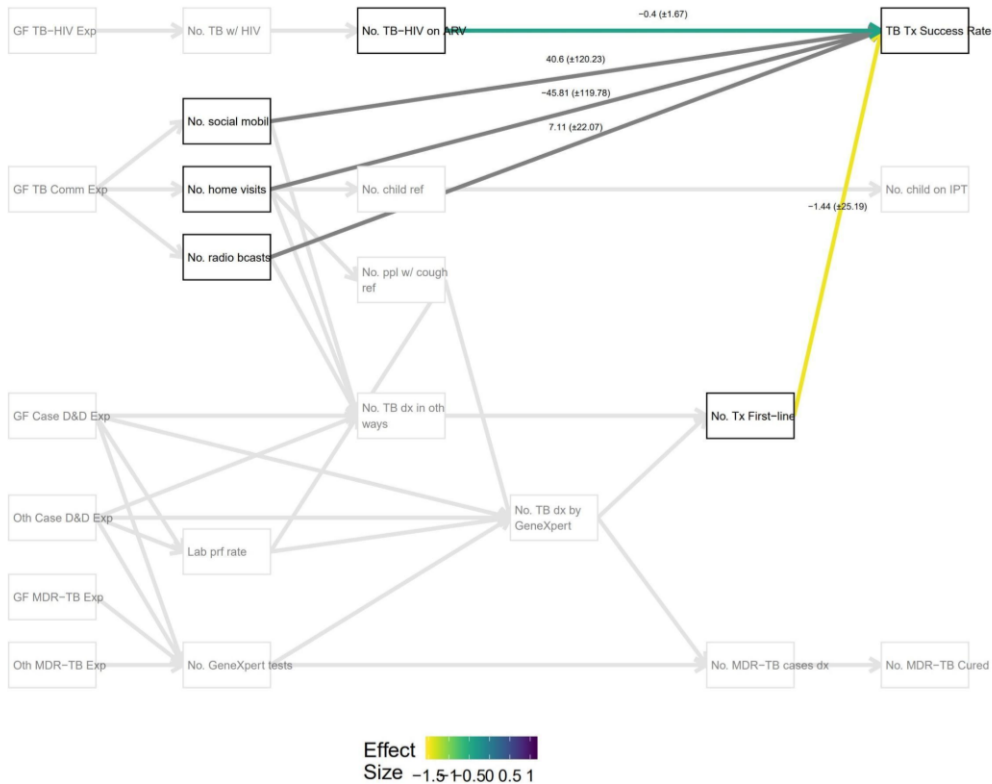
Category	Variable label	Definition	Data Source
Inputs	GF TB-HIV Exp	Global Fund expenditure on TB-HIV	(17, 18)
Inputs	GF TB Comm Exp	Global Fund expenditure on community-based TB activities	(17, 18)
Inputs	GF Case D&D Exp	Global Fund expenditure for case detection and diagnosis	(17, 18)
Inputs	Oth Case D&D Exp	Other development assistance for the detection and diagnosis of tuberculosis cases	(19)
Inputs	GF MDR-TB Exp	Global Fund expenditure on MDR-TB	(17, 18)
Inputs	Oth MDR-TB Exp	Other development aid for MDR-TB	(19)
Activities	No. TB w/ HIV	TB patients with HIV	(8)
Activities	No. social mobil	Number of social mobilizations carried out	(20)
Activities	No. home visits	Number of home visits searching for presumed cases (cough lasting 15+ days) carried out	(20)
Activities	No. radio bcsts	Number of radio transmissions conducted	(20)
Activities	Lab prf rate	Laboratory Performance	(8)
Activities	No. GeneXpert tests	Number of patients tested using GeneXpert	(8)
Outputs	No. TB-HIV on ARV	TB / HIV patients on ARV	(8)
Outputs	No. child ref	Number of children referred with contact cases	(20)
Outputs	No. ppl w/ cough ref	Number of people with cough lasting 15+ days referred	(20)
Outputs	No. TB dx in oth ways	Number of cases diagnosed by other methods (confirmed TB cases, all forms, less the cases confirmed using GeneXpert)	(8)
Outputs	No. TB dx by GeneXpert	Total GeneXpert tests performed	(8)
Outputs	No. MDR-TB cases dx	Number of MDR-TB cases	(8)
Outputs	No. Tx First-line	Total TB cases identified and treated	(8)
Outcomes	TB Tx Success Rate	TB treatment success rate	(8)
Outcomes	No. child on IPT	Number of children on IPT	(8)
Outcomes	No. MDR-TB Cured	Number of MDR-TB cases cured	(8)

### Part 3. Results



### Part 4. Conclusions

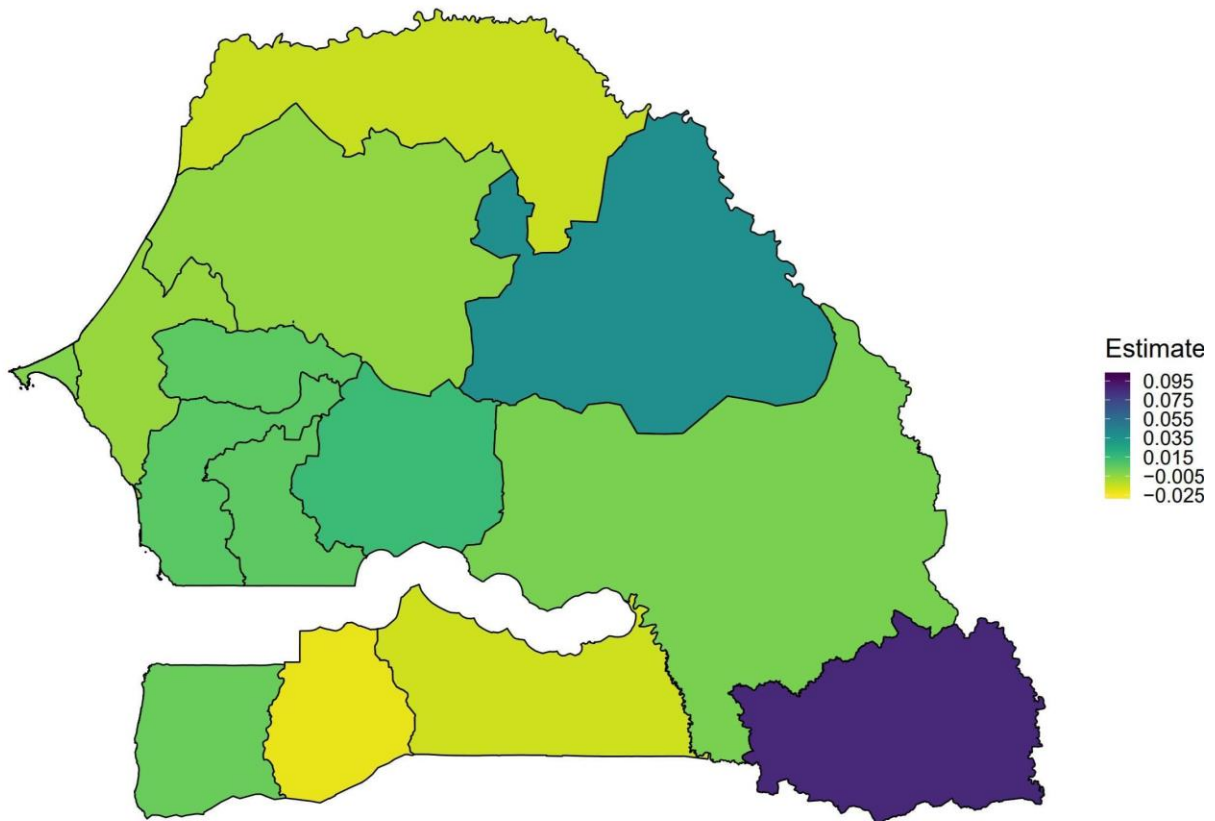
Finding 1: TB Treatment success rate not keeping pace with TB cases identified.



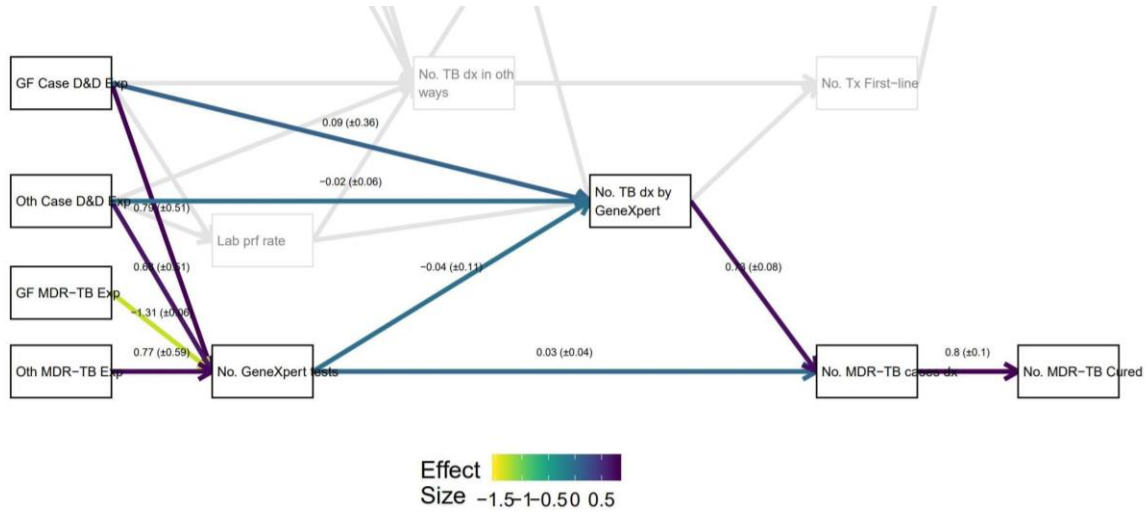
There is evidence from the model that suggests that increased identification and treatment of TB patients and TB-HIV patients is not leading to greater treatment success rates. While treatment success, both in terms of number and rate, may be increasing in some places, the negative effect sizes in the model indicate that case detection and treatment initiation have been increasing more quickly. This pattern had substantial subnational variation: some regions of Senegal experienced lower treatment success rates as they identified and treated more cases (regions such as Sédhiou, Kolda, and Saint-Louis in the south and north—yellow and light green in the map below).

In absolute terms, this suggests that the more cases found, the more the number of patients will not be successfully cured. Therefore, future goals to increase the number of patients starting treatment should also include planning to ensure the maximum number of patients successfully treated. Unfortunately, the model could not provide a more conclusive association regarding other factors which might influence treatment success rate such as social mobilizations, or home visits, due to data limitations.

Correlation between No. Tx First-line and TB Tx Success Rate



**Finding 2: GeneXpert usage funded leading to greater identification of MDR-TB.**

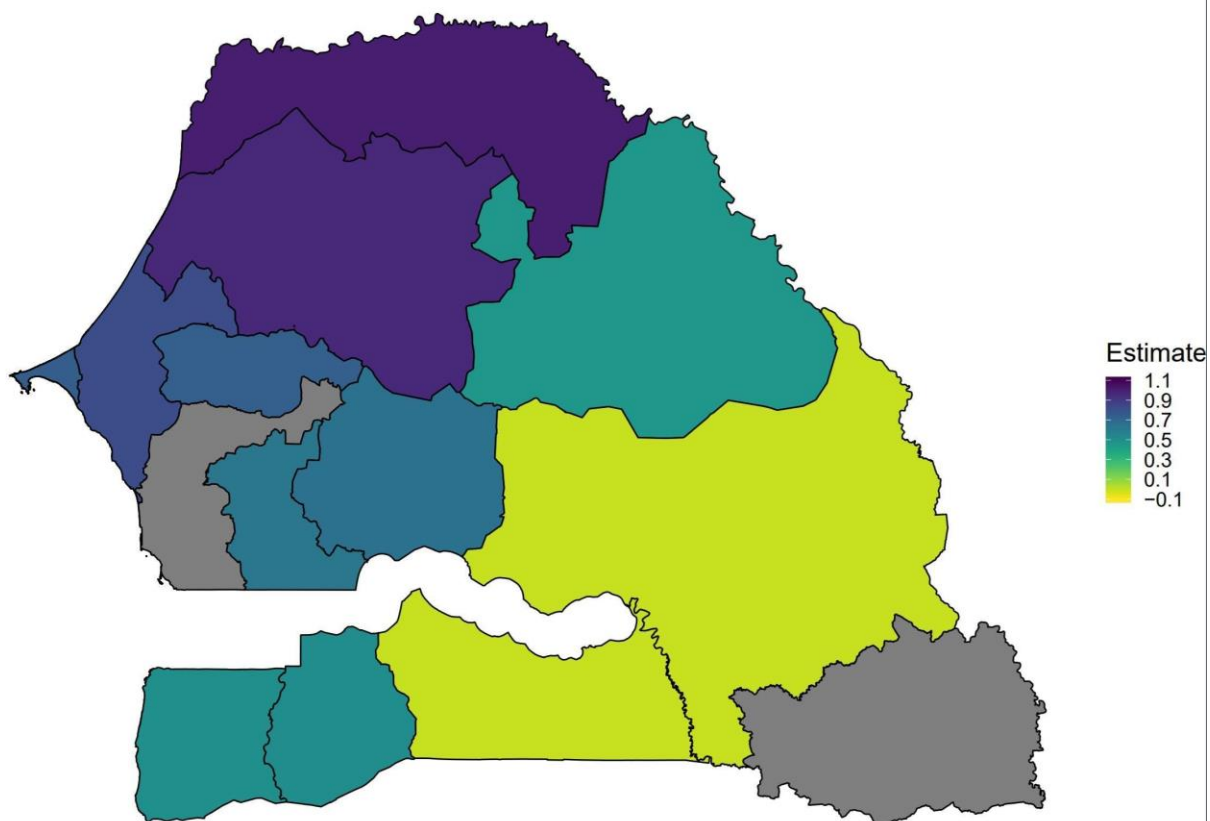


The TB model results suggest that Global Fund investments in case detection and other donor investments in MDR-TB (and drug susceptible TB) are leading to greater use of GeneXpert machines (e.g., we are seeing more people overall being tested with GeneXpert machines). The model also shows that greater use of GeneXpert machines is leading to more cases of MDR-TB diagnosed, though the strength of the relationship is uncertain. However, for drug susceptible TB the model does not show the use of GeneXpert machines leading to more cases diagnosed, although the strength of this relationship is also uncertain. This is likely because DS-TB is also diagnosed through other methods such as microscopy, chest x-ray, or based on symptoms, but may also reflect a testing strategy designed to increase case identification in low-prevalence areas.

**Finding 3: MDR-TB case diagnosed positively associated with MDR-TB treatment.**

In the case of TB-MDR, as more cases are diagnosed there has been a positive association with MDR-TB cases being successfully treated. However, this relationship shows some subnational variation. In regions farther from the capital, such as in the southwest and north, there has been a negative relationship. In addition, there are some regions that have not identified any TB cases which we were not included in the model (gray regions below: Kedougou and Fatick). The implication of the negative relationship is similar to that described above, that case detection has increased more rapidly than treatment success.

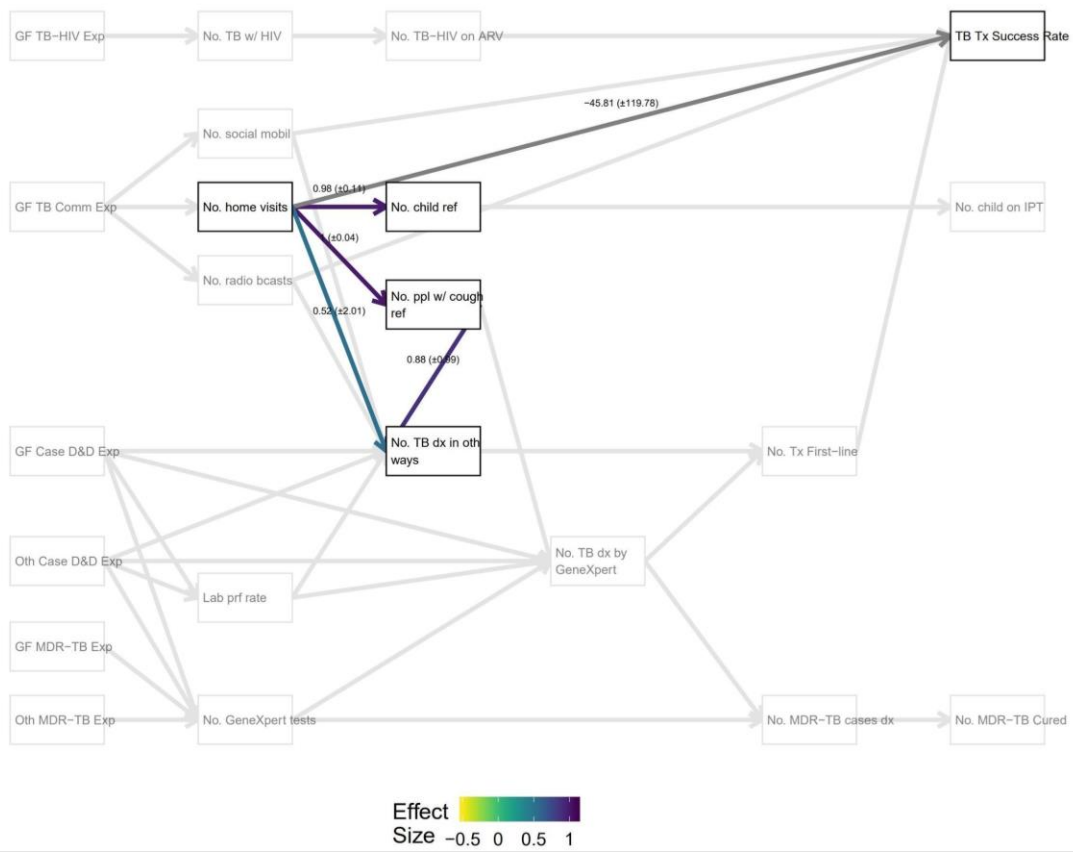
## Correlation between No. MDR-TB cases dx and No. MDR-TB Cured



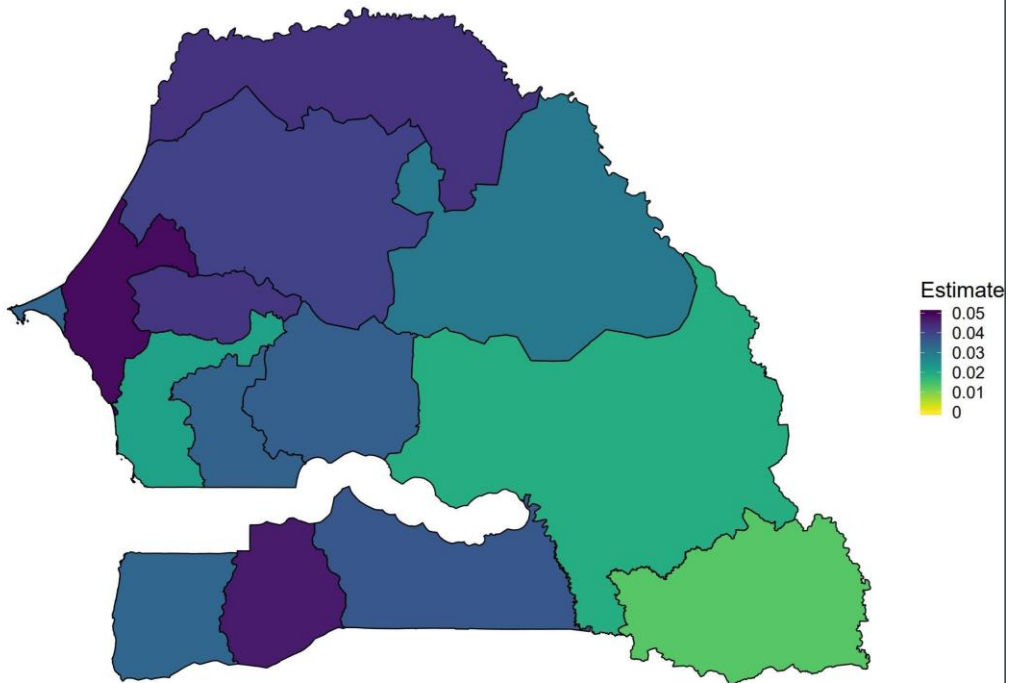
### **Finding 4: The model suggests that home visits have been helpful in referring people and children to care and are associated with increased case diagnoses.**

Home visits conducted as part of the TB Community Care funded by the global fund have been strongly associated with identifying people with who had a cough lasting longer than 2 weeks and referring them to care. In addition, a positive association between home visits and referrals of children was seen in all of the regions of Senegal. There was also a positive association between home visits conducted and TB cases that were diagnosed through means other than with GeneXpert. The relationship has substantial subnational variation, however. The finding was particularly strong in areas outside the capital of Dakar and neighboring regions. This could be due to greater use of GeneXpert in the capital. On the other hand, home visits were observed to have a very negative association with treatment success. Considering that this estimate also has a wide uncertainty interval, and that home visits occur in small numbers, it may be that conclusions about that specific pathway are impossible. Nevertheless, it suggests that home visits are a successful method of child and other referral.



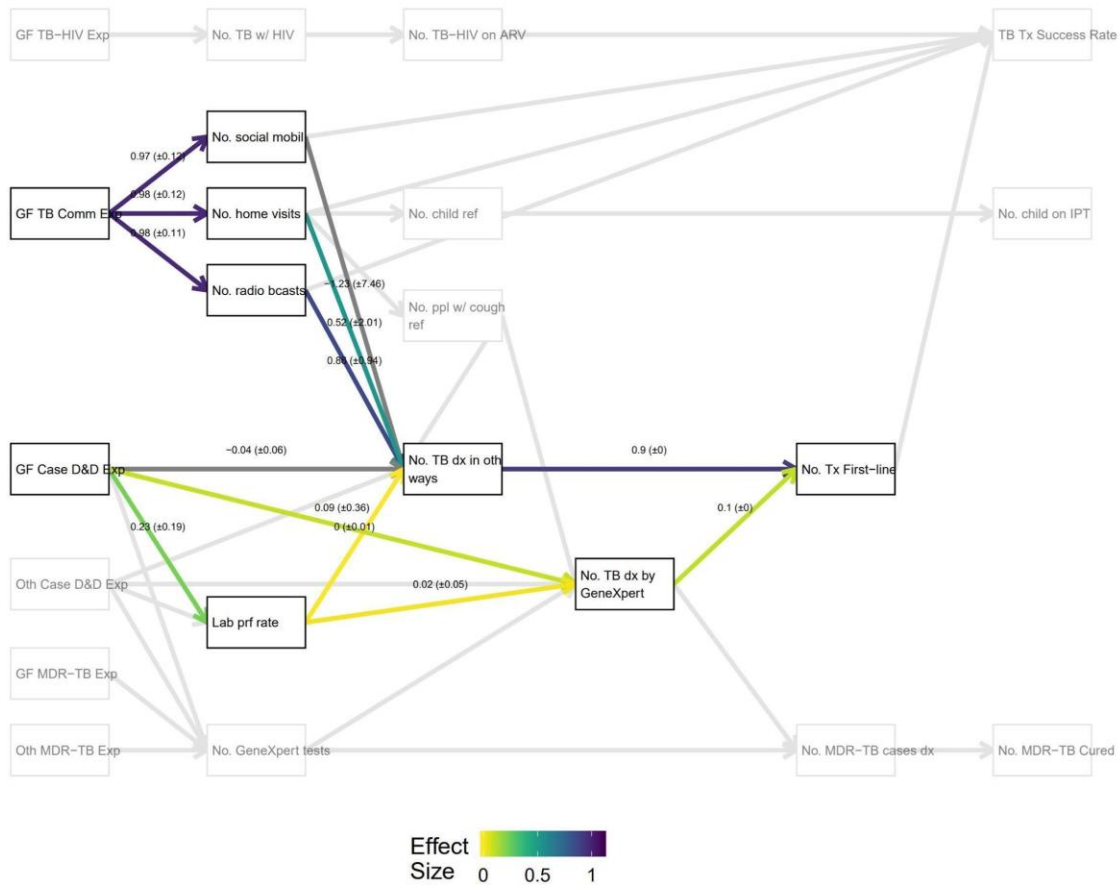


Correlation between No. home visits and People with cough referred



**Finding 5: Global Fund investments to identify TB cases have been leading to successful community care activities and improved laboratory performance.**

There is detectable relationship between Global Fund investments and adequacy of laboratories in Senegal. There is also evidence from the model that Global fund investments in TB community Care are effectively being translated into community care activities for TB, such as radio broadcasts and home visits. These activities funded by the global fund do seem to lead to greater number of TB cases being diagnosed, especially in comparison to other funding in case detection and diagnosis.



## **Annex 9: Budget Versions used in report**

Grant	Grant period	File	Budget total
SEN-H-ANCS	2018-2020	SEN-H-ANCS_Revised Budget_FC_FINAL_28Feb2019.xlsx	\$ 8,431,330.00
SEN-H-CNLS	2018-2020	SEN-H-CNLS_Revised Budget_FC_FINAL_28Feb2019.xlsx	\$ 19,826,072.00
SEN-M-PNLP	2018-2020	1c.SEN-M-PNLP_Budget (1).xlsx	\$ 38,197,996.00
SEN-Z-MOH	2018-2020	1c.SEN-Z-MOH_Budget (1).xlsx	\$ 12,681,802.00