Annex : Deep dives

Lao PDR – 1st Deep Dive[1]

1. Overall HSS grant parameters

Gavi approved three HSS grants for Lao People's Democratic Republic (Lao PDR) in 2010, 2012, and 2016 (HSS 1-3). The current HSS 3 grant runs from 2016-2020. The total approved amount of this grant is US$5.4 million, of which US$3.6 million has been disbursed as of June 22, 2018.

The HSS 3 grant has seven objectives, which are fully aligned with the Ministry of Health's Strategic National Health Sector Development Plan 8 (2016-2020), and the comprehensive Multi-Year Plan for EPI:

(1) Strengthen management capacity of immunization program at all levels.

(2) Improve service delivery and the coverage rate of current vaccines.

(3) Strengthen the community demand for MNCH and immunisation services.

(4) Maintain and improve the cold chain and logistics system

(5) Improve immunisation safety

(6) Strengthen the M&E capacity for EPI/MNCH management.

(7) Advocate for sustainable planning and financing system for high-level immunization.

2. PBF eligibility and performance payments

Lao PDR's baseline DTP3 coverage levels were 79% in 2011(HSS 2), and 89% in 2015 (HSS 3). It thus fell into Gavi's **low DTP3 performance bracket for HSS 2 and HSS 3**.

Lao PDR was assessed for eligibility to receive PBF grants between 2014 and 2017, and in that period, it qualified three times (2014-2016). It did not qualify in 2017 due to lack of progress in coverage. Between 2014-2016, Lao earned a total of **US$2.3 million in performance payments**:

- In 2014 (i.e., for 2013 implementation year), Lao earned US$612,060 for DTP3 performance, and US$842,310 for MCV1 coverage.
- In 2015, Lao earned US$126,690 for DTP3 performance, and US$ 314,850 for MCV1.
- In 2016, it earned US$ 172,500 for DTP3 performance, and US$ 221,070 for MCV 1 coverage).

The full amounts for all three PBF payments were disbursed to Lao in December 2014, February 2016, and October 2017.

3. How was the PBF payment used?

PBF budget data for Lao is available for 2016. Table 1 summarizes how the PBF payment was used in this year. Interviewed key informants reported that the PBF payments were used to fill gaps at local

[1] In-country key informant interviews conducted with: Anonh Xeuatvongsa, MoH; Lauren Elisabeth Franzel Sassanpour; Titus Angi, UNICEF; Phouvanh Vonglokham; UNICEF

and district level, i.e. the funds were used to support districts that were lagging behind in vaccination coverage:

> "Some districts have done a good job, but others are not doing so well, so we allocate the funding to fix the problem where it is. PBF funding is flexible and helps us with that. We focus on districts with weak coverage. We improve supervision, data quality, and train local people to deliver the communication to increase demand for vaccines".

The country level representatives especially highlighted the need to train health workers from ethnic communities to help with communication challenges – local communities often do not understand Laos languages:

> "Increasing coverage from 75% to 80% is not too hard. But going to 90% is very tough. If you want to have increase you need to convince the local leaders of the communities and of the districts, including the ethnic chiefs – and this requires special efforts – they do not speak Laos. Through our micro-planning mechanism, which is also supported by the PBF, we focus on health centers in these communities – to get them involved and working together."

Table 1: PBF budget for 2016 performance payment (2015 implementation year)

Gavi Activity Category	Selected Key Activities	Amount (US$)
Service delivery	• Supervision at provincial and district levels • Extended vaccination room at district level	80,000
Capacity building of human resources	• Micro plan training • AEFI response and causality training • Training of cold chain technicians and provision of toolkits	150,000
Procurement and supply chain management	• Procured incinerators including transportation	30,000
Advocacy, communication and social mobilisation (ACSM)	• Social mobilization in ethnic minority communities including audio visual, IEC material development, production and development of a training package for volunteer • Introduced new initiative to 'full immunisation village model' for improving routine immunisation coverage among ethnic minority and high-risk villages • Procure local loud speakers	120,000
Others	• External audit	13,750
Total		**393,750**

4. How important is the PBF for the country?

The three country stakeholders that we interviewed argued that **Gavi's PBF is very important and critical to Gavi's success in Lao**. On average, stakeholders ranked Gavi's PBF support as 3.5 on a scale of 1 to 4, with 1 being lowest relevance and 4 being highest relevance. The range of rating values was 2.5-4, which indicates that not all country level stakeholders consider the PBF as highly relevant.

One stakeholder argued that the size of performance payments is determined by the number of additional children vaccinated. As pointed out by the interviewed country-level representative, Lao – as a small country – has a rather small annual birth cohort (180,000), which limits the size of the performance payment. Another stakeholder argued that the amounts are rather small, compared to the overall amounts provided by Gavi and another World Bank PBF scheme. This stakeholder argued that the performance payment was "more or less undiscussed and uncelebrated".

5. **Was there a motivational effect? Did the PBF model incentivize the country to intensify its immunization efforts?**

Country-level representatives believe that Gavi's PBF provided **some motivation to improve immunization coverage in Lao**. However, opinion of country level stakeholders differed to some extent:

> "Absolutely – it [the PBF] does motivate us. If the country has done a better job, it will get a reward. We also allocate funds to districts to stimulate better work (…). PBF is quite clever mechanism from the donors."
>
> "It [the PBF] brought in a new way of thinking. It made the government thinking differently about immunization, and it changed the policy level decisions. For example, the government had the MCH partnership but with Gavi's HSS PBF funding, the government included immunization in the package. Subnational planning was also not existing before Gavi provided the grant to the country. It [the PBF] really caused a shift in strategic planning and advocacy. It also led to more support from government and other donors."
>
> "Not sure that Gavi's PBF has motivated more action at lower levels – at district level or within [health] facilities. I think that Gavi should communicate about its PBF differently. There is only little discussion or acknowledgement."

Overall, Gavi's PBF helped to further reinforce a trend towards better immunization planning in Lao PDR. As one stakeholder reported, it also helped to introduce a performance-based service delivery culture, which subsequently also helped other funders, such as the World Bank and South Korea with their performance-based programs.

6. **How effective has PBF been at improving coverage and equity?**

The interviewed country-level stakeholders in Lao believe that Gavi's PBF program has been "very successful," giving it a **rating of 7** on a scale of 1 to 10, with 1 being failure and 10 being highly successful. He also argued that the PBF helped to increase coverage and equity:

> "PBF has absolutely contributed to equity and coverage. It allows us to access funds. Based on this, we can act quickly to increase coverage in ethnic groups; rural areas; children in the bush and slums. "

It is methodologically very complex to attribute changes in coverage or equity specifically to the PBF, and it is way beyond the scope of this review. A review of immunization coverage indicators shows that Lao **increased DTP3 coverage from 78% in 2011 to 89% in 2015, and MCV 1 coverage increased from 69% to 88% in 2015** (Table 2). However, in 2016, both indicators dropped substantially – as also recognized by country level key informants:

> "In 2007, we had 60% coverage – in 2015, we almost had 90%. In 2016, we had an outbreak and that resulted in decreasing coverage."[2]

One reason for this drop in coverage was that the outbreak diverted resources from the routine immunization ("the same health staff was involved in the polio campaigns, so it was challenging for them to do both things). In addition, some of the campaigns were run in an integrated manner (e.g. polio and measles), which led to challenges in terms of data collection and lower registration number for measles and DTP.

Table 2. Lao's performance on key immunization coverage indicators (Source: WUENIC)

Year	2011	2012	2013	2014	2015	2016
DTP3	78	79	87	88	89	82
MCV1	69	72	82	87	88	76
Equity (% of districts with >= 80% DTP3 coverage)	45	48	74	79	78	61

The interviewed country stakeholders reported that **"PBF funding contributed to increased coverage in certain districts. PBF funding has been sent to many districts."**

We have thus also analyzed subnational coverage. Table 1 shows the performance on the PBF equity indicator (this is not used to assess performance by Gavi because Lao is still in the low-coverage group). While the performance of districts significantly improved since 2011, there was a substantial drop in 2016 in line with drop in coverage at national level (this indicator rose slightly to 64% in 2017).

In addition, we analyzed trends in pentavalent 3 coverage across districts in Lao PDR between 2009 and 2017. Of the districts reporting increases in coverage, the average net change in coverage between 2009 and 2017 was 21% (IQR: 10% to 31%) while the average annual rate of change (AARC) for pentavalent 3 vaccination across all districts was 3.4% (IQR: 1 to 5%). A comparison of AARC between 2015 (when PBF support for pentavalent 3 commenced) and 2017 with AARC between 2009 and 2017 reveals a less optimistic picture - the mean AARC across all districts was -2.7% (IQR: 0% to 7%).

PBF Process: Management, alignment, oversight

Country level representatives liked the fact that t**he PBF payments can be used in a flexible way.** As one respondent said:

> "The PBF payments can be used in a flexible way. We have the funds in the ministry and we can access it easily. We just need to get approval from the minister and then we can access

[2] In 2015 and 2016, Lao PDR had experienced and outbreak of circulating vaccine derived poliovirus type 1 (cVDPV1). http://polioeradication.org/news-post/end-of-outbreak-in-lao-peoples-democratic-republic/

> the funds. That is easy. If money stays in the hand outside of the government, it can take 1-2 months to get it."

Concerns were raised about the quality of data and the potential to overreport:

> "There needs to be a quality check. The data needs to be validated and monitored. We need more supervision. We need better impact evaluation. Drawbacks are in quality of data and close monitoring."

Stakeholders thus demanded a more independent assessment of the impacts of PBF through Gavi.

Conclusion

Our country key informants were mostly positive about their experiences with Gavi's PBF. They reported that Gavi's PBF motivated lao PDR to improve immunization coverage and equity. The country showed improvements in its vaccination coverage indicators but showed a worsening in 2016 due to a polio outbreak. The response to it diverted resources from the general EPI efforts (highlighting the need to further strengthen the Lao system). Stakeholders asked for better supervision to ensure that the data from districts and facilities are reported accurately.

Tanzania – Deep Dive[3]

1. Overall HSS grant parameters

Tanzania's Gavi HSS grant runs from 2014 to December 2018. The total amount of this grant is US$13.5 million. The HSS grant has three objectives:

- **Objective1:** Improved immunisation outcomes (coverage and quality) in the context of integrated health services nationwide
- **Objective 2:** Increased community participation in the provision of immunisation services, particularly in rural and hard to reach areas.
- **Objective 3:** Improved cold chain capacity and management.

2. PBF eligibility and performance payments

Tanzania's baseline DTP3 coverage level was 91% (2013), so it fell into Gavi's **high DTP3 performance bracket**. It was assessed for eligibility to receive PBF grants between 2015 and 2017, and in that period, it has qualified for a total of **US$4.0 million in performance payments**.

- In 2015 (i.e., for 2014 implementation year) it qualified for US$ 800,000 for DTP3 performance, but no performance payment for equity.
- In 2016 and 2017, it qualified for US$ 800,000 for DTP3 performance in each year, and US$ 800,000 for equity performance in each year (a total of US$ 1.6 million in 2016 and 2017).

3. How was the PBF payment used?

Total **disbursements** to date for Tanzania amount to US$800,000, which represents the 2015 performance payment for the 2014 implementation year.

The US$800,000 disbursement went to the **Clinton Health Access Initiative** (CHAI). The breakdown of the CHAI 2015 budget was: US$596,503 for warehouse expansion and rehabilitation; US$87,000 for procurement of a generator, air conditioner, shelves, bar code scanners, computers, and furniture; US$29,860 for quality assurance; and US$86,637 for CHAI management. The funds were disbursed in December 2017.

The 2016 performance bonus will be used for the co-financing (20%) of the **Cold Chain *Equipment* Optimization Platform** (CCEOP). At the time of writing this report, this funding was in process to be paid. This funding will be directly disbursed to the UNICEF Supply Division in Copenhagen, together with the overall CCEOP amount (overall, the CCEOP grant will amount to over US$10 million to be paid in two tranches). As highlighted in the main PBF review, a range of other Gavi countries used or intend to use the PBF for this purpose (i.e., for co-funding CCEOP).

Currently, Tanzania plans to use the 2017 performance payment for **bridge funding** – as the current HSS grant comes to an end in December 2018. The new grant will likely run from 2019-2023. The IRC review is expected to take place in November 2018, and therefore there might be no HSS funds in

[3] In-country key informant interviews conducted with Dafrossa Lyimo, EPI Manager, MoH; Esther Mtumbuka, CHAI; Pamphil Silayo, UNICEF.

the first quarter of 2019. What this payment schedule means is that Tanzania could be without HSS funding from January to March, 2019, and thus Tanzania's current plan is to use the PBF to bridge this gap.

The Tanzania example shows the variety of ways of how PBF funding is used. Country representatives found the flexible use to be an important feature of the PBF funds.

4. **How important is the PBF for the country?**

Country stakeholders that we interviewed argued that **Gavi's PBF is very important and critical to Gavi's success in Tanzania**. On average, stakeholders ranked Gavi's PBF program as 4 on a scale of 1 to 4, with 1 being lowest relevance and 4 being highest relevance. Some illustrative quotes are given below:

> *"Tanzania is a poor country. Still struggling to allocate money to EPI…PBF payments are **very useful.**"*

The performance payment, which was provided to CHAI, was seen as a critical investment to improve vaccine distribution following a change in vaccine distribution system:

> *"For a country like Tanzania, PBF is critical in the program. During the joint appraisal, we realized that the **vaccine distribution cost** would be very high. There was a change – now the distribution was managed by the vaccination department itself and that caused more cost (previously, it was managed by the medical store department). Gavi was thankfully in support of the shift process for vehicles for transport, and for the upgrading of the warehouse (including training of staff). This is a core component.*

While the performance payment thus made an important contribution, overall **only a fifth of the US$4 million in performance payments (US$800,000) was disbursed** up until June 2018. This is a relatively small amount (less than 6% of the overall Gavi HSS grant). Assessing the relevance of the remaining undisbursed 80% of PBF funding is impossible at this stage. As other payments will be used to co-finance the CCEOP and for bridge funding, it will be difficult to measure their individual effect.

5. **Was there a motivational effect? Did the PBF model incentivize the country to intensify its immunization efforts?**

While it is difficult to assume that the first performance payment had a substantial effect on immunization coverage and equity in Tanzania, country-level representatives believe that Gavi's PBF provided **strong motivation to improve immunization coverage in Tanzania**.

In the words of the country level key informants:

> *"PBF helped the country to see a way to add resources to the program. If we do better, we will be rewarded. Government is more serious about the EPI program."*

> *"Encourages Tanzania **to improve our service delivery** – cold chain, distribution of vaccines and other things. It also helps in reaching remote areas**.** We also improved the reporting at district level to qualify for PBF."*

Key informants also reported that the focus on equity stimulated discussions at the subnational level on ways to ensure that no child was left out.

6. How effective has PBF been at improving coverage and equity?

Country-level stakeholders in Tanzania believe that Gavi's PBF program has been "very successful," giving it an **average rating of 8.7** on a scale of 1 to 10, with 1 being failure and 10 being highly successful.

It is methodologically very complex to attribute changes in coverage or equity specifically to the PBF, and it is way beyond the scope of this review. Also, the disbursements to CHAI were only made in December 2017, and it requires more time to see the effects of this payment. Key informants interviewed argued that Gavi's PBF will significantly contribute to equitable coverage. However, while this is an important data point, it is no proof or hard evidence.

A review of immunization coverage indicators shows that **Tanzania increased DTP3 coverage from 91% in 2013 to 97% in 2016** (Table 1).[4] According to WUENIC data, the percentage of districts reporting DTP3 coverage greater than 80% increased from 79% in 2013 to 92% in 2016 (Table 1). MCV1 coverage stayed the same at 99% between 2013 and 2015 but dropped to 90% in 2016. Despite the recent decline in MCV1 coverage, Tanzania still qualified for performance payments under the current incentive structure. With high performing countries, bonus payments are allowed even if MCV1 coverage falls as long as coverage is *greater than 90%,* regardless of trends. This drop in coverage has been attributed to procurement delays that happened at the country-level.

Key informants expressed concerns about the **need for better indicators to measure equity**, and a need to **find ways to address areas in the country that still had the "10% gap"** i.e., areas that had failed to move beyond the 90% coverage rate.

Table 1. Tanzania's performance on key immunization coverage indicators (Source: WUENIC)

	2013	2014	2015	2016
DTP3 coverage	91	97	98	97
Equity (% of districts with >= 90% DTP3 coverage)*	79	89	92	92
MCV1	99	99	99	90

According to a recent data review conducted by Gavi (April 2018), there remains **substantial variation of immunization performance across districts**. Figure 1 shows distribution of districts performance for DTP3 coverage across years. While the number of districts with coverage below 80% has slightly increased in 2017, much more number districts achieve coverage levels of more than 90%. Districts in the Western-Northern region have on average the lowest coverage levels (77.5% in 2017). As shown in Figure 2, there was a decline in MCV1 coverage among districts in 2016.

[4] Interviewees did mention three changes that had happened, but these were in the context of the overall HSS grant and EPI program, and it is hard to know whether or how much the PBF made a specific contribution. These changes mentioned by key informants were: (1) development of a country vision of what to do with the funds, (2) improvements to the vaccine storage capacity from being able to store supplies for one month to now three months, and (3) adaptation of the WHO's RED (Reaching Every District) strategy guidelines (and other guidelines) to be more applicable to Tanzania.

However, in 2017, nearly half (45%) of the districts had a DTP3 coverage of over 100%, which shows that there are still significant measurement issues, likely due to inaccurate data on the distribution of Tanzania's population.

In terms of **subnational level reporting**, Tanzania's reporting is to 100% complete (even if there is small variation in the timeliness of reporting in some regions). This might also be seen as an indicator that the country is very motivated to improve data to manage the system better and to win the PBF payment as mentioned by one of the interviewees.

Figure 1: DTP3 coverage at district level (Source: Gavi: Data Desk Review 2018)

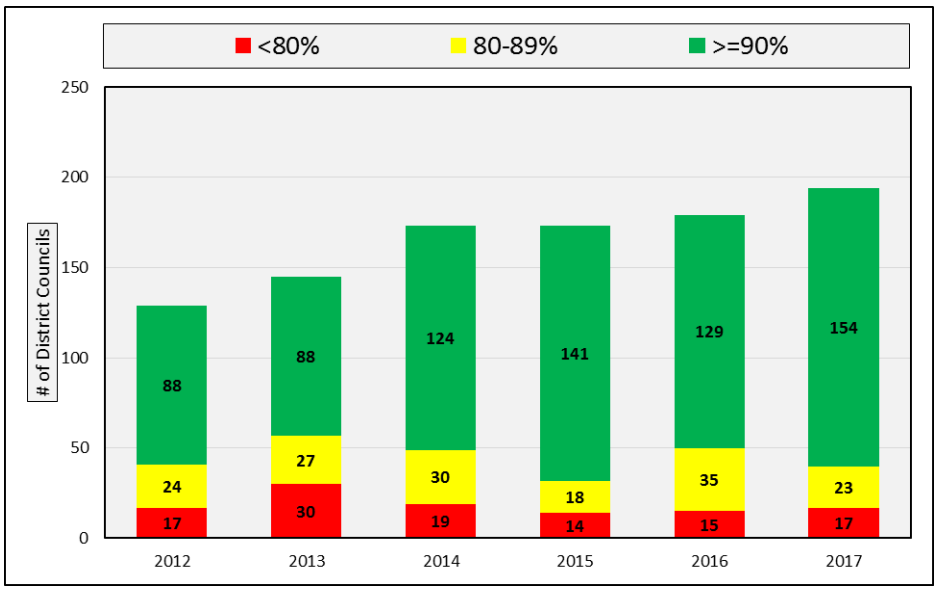
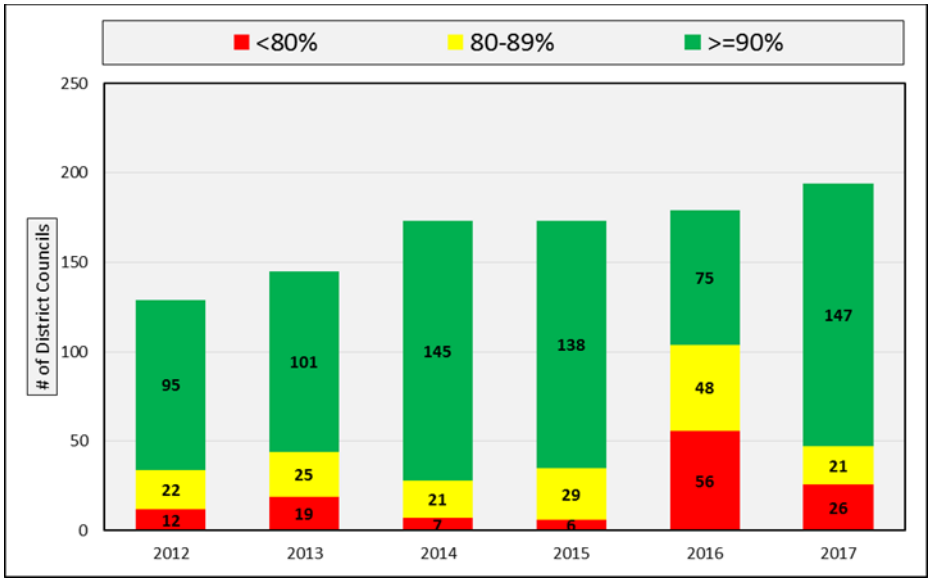


Figure 2: MCV1 coverage at district level (Source: Gavi: Data Desk Review 2018)



PBF Process: Management, alignment, oversight

T**he PBF process faced challenges in terms of alignment with country planning cycles.** As one respondent said:

> *"Our planning cycle usually ends in June/July. However, PBF comes only a year or so later. We need to change the budget and workplan. That is the biggest challenge."*

> *"You earn the money when you already have the annual plan approved. Then you need to redo the plan."*

This exemplifies one of the challenges of Gavi's PBF. It is a global mechanism, which does not take into account country schedules. It requires that countries change their own plans and budgets.

Within the country, processes were strong. They were not different to other Gavi processes. Budgeting and planning was supported by other partners from a technical working group on immunization, including WHO, UNICEF, CHAI, and PATH. A joint appraisal process was set up and through these periodic meetings, partners discussed progress with immunization coverage and prioritized how to use PBF funds.

> *"How the funds can be utilized is quite good. It is also quite transparent. The process has been very positive. The discussion has been in the technical working group under MoH leadership. We also discussed it [the PBF] as part of the joint appraisal process, together with Gavi."*

> *"We used the structure that we have in Tanzania. The ICC discussed the use of the funding. The financial reporting is done through the ICC and the technical working group. We did discuss and there was no differences to the usual reporting process."*

There were mixed reactions about the country's capacity to use funds. Thus far, Gavi had disbursed a total of US$7.8 million in overall HSS funds (57%).[5] This shows that the country struggles to use the HSS core funding. As one country representative explained, there was thus no need to rapidly decide about the use of the PBF payment. Rather, the country decided to prioritize the core funding.

> *"The **country faces difficulties to spend money**. Some activities were delayed. It is overwhelmed by activities that it is required to do."*

Conclusion

Country key informants were positive about their experience with Gavi's PBF. The country showed improvements in its vaccination coverage indicators between 2013 and 2015, but showed a worsening (for MCV1) in 2016. Nevertheless, under the current incentive structure, the country still qualifies to receive payments. Funding to date from the PBF has been used by CHAI mostly for warehouse expansion and rehabilitation, aimed at improving the cold supply chain. The specific contribution of this funding to changes in coverage and equity will be substantial according to country stakeholders but remain overall unclear (given that the funds were only disbursed in December 2017). It is also impossible to predict the impact of the next payments on coverage and equity—these will be used to co-finance the CCEOP and for bridge funding. Tanzania faced

[5] Source: Gavi disbursement sheet. https://www.gavi.org/results/disbursements/

challenges with aligning its budgeting and planning systems with Gavi's PBF cycle and there were also concerns about the country's ability to absorb the funds.

Ethiopia – Deep Dive[6]

7. Overall HSS grant parameters

The first Gavi HSS grant (HSS 1) covered the period 2007 to 2009 (US$76.5 million disbursed), and the second (HSS 2) covered the period 2012 to 2015 (US$61.4 million disbursed).

The current HSS grant (HSS 3) covers the period between 2016 to 2020 (US$80.6 million commitment, $49.9 million approvals, US$34.5 million disbursed as of 22 June 2018). HSS 3 lists the following core activities:

- Improve Immunization coverage in low performing and hard to reach areas in the country through CSOs and other non-state actors involvement
- Strengthen the Health Extension program through preservice training, Integrated Refresher Training, upgrading training and improving the infrastructure of the health post
- Strengthening Cold Chain and Supply Chain System: Procurement of Generators, cold chain equipment, Spare parts, waste disposal and Expand the storage capacity at zonal level
- Strengthening and Upgrading the Supply Chain Networking Design
- Capacity building activities
- Supporting the Vaccine transition at PFSA
- Strengthening Regulatory System on Vaccine Quality Control
- Strengthen the HMIS and CHIS
- Support performance review.

8. PBF eligibility and performance payments

Ethiopia was assessed for eligibility every year between 2014 and 2017, as a **low baseline coverage country** (below 90% DTP3 coverage). It **never qualified for performance payments** under the current PBF model. In all four years in this period, it failed to qualify based on poor data quality.

9. Key challenges in terms of PBF eligibility

Overall, Ethiopia continues to struggle with low vaccination coverage rates according to WUENIC data for several antigens and major inequities in vaccination coverage. For example, the 2016 joint appraisal report notes that children from rural areas, the lowest wealth quintile and non-educated mothers tend to have lower DTP3 vaccine coverage rates.[7] As we highlighted in the PBF review, countries with low coverage and weak capacity find it difficult to qualify for performance payments. Ethiopia is also a large country, with a population of over 100 million, facing specific challenges relating to its size.

However, when it comes challenges in terms of PBF, we find three specific reasons why the country struggles to qualify for PBF reviews: knowledge on the PBF model, data issues, and the performance target itself (increases in coverage).

[6] In-country key informant interviews conducted with Marisa Ricardo, UNICEF; Mulat Nigus, MoH; Pamela Mitula, WHO.
[7] GAVI Ethiopia Joint Appraisal 2016.

Knowledge on Gavi's PBF and motivational effect of the PBF model

We found that there was a lack of knowledge about PBF at the country level. Country level representatives seem to know very little about Gavi's PBF. None that we interviewed were able to describe the PBF model in detail – for example, no interviewee was able to accurately describe how to qualify for PBF rewards. One interviewee was not clear about the fact whether Ethiopia had received a PBF award or not.

Gavi shared information from the time the HSS proposal was developed. The country received the PBF verification form and the PBF information sheep. In addition, there was communication on baseline data and the verification mechanism, and the country chose to use its administrative data, despite the knowledge that the discrepancy with WUENIC would result in them not qualifying for PBF. So, while key country stakeholders might have been informed about the implications, at the time we conducted the interviews, the knowledge on the PBF model was low.

We also did not find any evidence that the country was incentivized by the PBF payment to change or improve any planning processes or implementation practices to qualify for PBF payments. No interviewee reported that any special efforts were made.

Data issues

At the same time, key informants were very aware of the **problems surrounding the quality of data** in the country and that this impeded Ethiopia to qualify for performance payments, and these issues were discussed with Gavi and during the joint appraisals (see also the section on the new Gavi data grant below).

However, for **political reasons**, Ethiopia chose to use its own administrative data for the PBF baseline, despite the fact that this data differs significantly from the WUENIC data, which is used to verify PBF performance. The **discrepancies between the country's own administrative data and the WUENIC data** were 5-10 percentage points in recent years. This illustrates one general challenge with the verification model. The differences between Ethiopia's own data, which had to be used for the baseline (69%) at the launch of the HSS grant, diverges significantly from the WUENIC data. As such, it was extremely difficult for the country to earn the performance reward.

Country representatives also were concerned that **using national-level data masks some of the progress** that might be visible if subnational data were used. We **tested the hypothesis that using sub-national performance data** would have affected whether Ethiopia qualified for a reward payment. We modeled what would have happened if Ethiopia (a) had used only WUENIC data and (b) was assessed for an equity award if the country showed any improvement in the number of districts that report DTP3 coverage above 80%. The results show that between 2013 and 2016, Ethiopia showed a significant improvement in equity (Table 1). The percentage of districts reporting DTP3 coverage above 80% increased sharply from 50% in 2013 to 76% in 2016. In this scenario, the country would have received equity awards in 2015, 2016, and 2017 for year-on-year improvements over that period despite the apparent lack of progress visible by using only national averages.

In addition, using WUENIC data only and making no other changes to the program (i.e. in terms of subnational reporting/equity), Ethiopia would have received an award for its increase in DTP3 in 2014 (for 2013 implementation year), and in 2015 (for 2014 implementation year). The country

would have also qualified to receive an award for its MCV1 increase in 2015 (for 2014 implementation year).

However, in interviews with country-level key informants, it was not clear whether Ethiopia would be willing to use WUENIC data in the future. Country stakeholders, however, did report that there is now much more triangulation of data sources than in previous years and this might be seen as an indication that the country is more open to also rely an alternative data sources in the future.

Table 1. Immunization coverage performance indicators for Ethiopia (Source: WUENIC)

Ethiopia	2012 (baseline year)	2013	2014	2015	2016
DTP3 coverage	69	72	77	77	77
Equity (% of districts with >= 80% DTP3 coverage)	54	50	65	74	76
MCV1	65	62	70	70	70

Performance target

Trends in coverage also show that coverage at national level is stagnating since 2014 according to WUENIC data. This shows that – in addition to measurement – progress in terms of coverage at national level is slow. Ethiopia has a population growth of 2.5% per year, which indicates that additional children are immunized in every year. This, however, is not visible (and rewarded) due to the lack of progress in terms of coverage.

As such, Ethiopia exemplifies a more general finding from our review: The PBF model is too ambitious – its outcome focus is too difficult and ambitious for many countries; often more time is needed to achieve the outcomes.

New grant to improve health information and surveillance system under fragility policy

As discussed in the review, Gavi acknowledged for a few fragile countries that it would be difficult for qualify for performance payments. Gavi in turn decided under its fragility policy (or previously under the country tailored approach) that these countries could still receive the PBF payment to improve the health information and surveillance system.

Ethiopia may soon receive such an HSS grant to improve the **health information system** of about US$15 million under Gavi's fragility policy. Under the fragility policy, it was decided to use the available funding from the PBF to improve the data situation. This step was very much valued by country representatives:

> *"To me data is the basis for everything what we do. It guides the work. Any effort to improve data is very useful. My main concern is the poor state of health data systems."*

Conclusion

Ethiopia's experience with Gavi's PBF is a very good example of a low coverage country that did not qualify for a reward payment due to poor data quality. Country managers seem excited and are eagerly anticipating the data improvement grant. Our modeling showed that using an equity indicator would have led the country to qualify for a performance reward. However, as we describe in the main report, within Gavi, there has not been a culture of learning that would have allowed this alternative approach to have been used. As we discuss in the review, it was anticipated by the Board in 2011 that the equity indicators could also be used by countries with lower coverage if it worked for high coverage countries.

Burundi PDR – Deep Dive[8]

1. Overview: Gavi HSS grants to Burundi

Burundi emerged from its 1993-2005 civil war with a weakened health system. In addition, subsequent economic constraints faced by the country further contributed to the weakening of the health system, with insufficient human resources in public health facilities.[9]

To improve health care quality and national health outcomes, the government prioritized HSS within its 2005-2015 national health policy plan, seeking financial and technical support from several global agencies partnerships, including Gavi, which approved **HSS grants for Burundi** in 2007, 2012, and 2017 (HSS 1-3).

Gavi's second HSS grant – **HSS 2** – ran from 2013 to 2017 (including a one-year no-cost extension due to the 2015 political crises; see below). A total of US$12.3 million was approved. HSS 2 had five objectives:

- **Objective 1:** Strengthened capacity for the delivery and use of high quality immunization services;
- **Objective 2:** Established contractual commitment of peripheral health facilities and community-based organizations (CBOs) with a view to improve the performance of district vaccination units with low immunization coverage rates;
- **Objective 3**: Ensured access to vaccines and the rational management of the supply chain, logistics and medical products and equipment safety;
- **Objective 4**: Strengthened system of health information and M&E on community interventions; and
- **Objective 5:** Improved program management.

HSS 3 runs from 2018 to 2020, with a total commitment amount of US$29.9 million and an approved amount of $22.3 million (as of 22 June 2018).[10]

2. Gavi PBF eligibility and performance payments

Burundi was assessed for PBF eligibility during HSS 2 – more specifically, in the years 2014, 2015, and 2016. Burundi's **DTP3 baseline for the PBF assessment was 96%** (YR2012), and therefore it fell into Gavi's high DTP3 performance group.

Burundi qualified for performance payments in all three years, earning a total of **US$4.3 million** in rewards. In both 2014 and 2015, Burundi earned a performance payment of US$860,000 and an equity payment of US$860,000 (US$1.72 million per year). In 2016, Burundi qualified for a payment of US$860,000 for DTP3 coverage but it did not qualify for an equity payment.

It is important to understand the context in which the performance payments occurred. In 2015, Burundi was heavily affected by a **severe political crisis**. At this time, Burundi was facing a no-contact

[8] In-country key informant interviews conducted with Dorothee Ntakirutimana, Burundi, Health Specialist at UNICEF Burundi; Olivier Nijimbere, Burundi, EPI Director; Alain-Desire Karibwami; Burundi, World Bank.
[9] Gavi country factsheet: Burundi. See also: Cailhol, J., Mathole, T., Parsons, A., Sanders, D., Kandondo, D., Ndayiragije, I., & Niyongabo, T. (2007). Burundi: Building a health system together with Global Health Initiatives, in the aftermath of war.
[10] https://www.gavi.org/country/burundi/

policy by many donors. While Gavi also suspended its cash support, it negotiated with the government over a ten-months period that its HSS funds should be provided through UNICEF (and no longer through the government). Due to this successful negotiation, it could be ensured that essential services were provided (see also Section 6). As a result of the negotiation phase, there was a one year no-cost extension of the HSS grant. In addition, the second performance payment was fully consolidated into the general HSS programming. From an evaluation perspective, this means that the effects of the second PBF payment cannot be accurately assessed because it was provided in a consolidated way with the general HSS support.[11] In addition, the third PBF payment was consolidated into HSS 3 (2018-2020).[12]

3. How were Gavi's PBF payments (1 and 2) used?

Gavi disbursed the PBF payments for the years 2014 and 2015 in April 2015 and September 2016 respectively. With total disbursements of US$3.4 million, Burundi is the country with the third largest PBF disbursements in the period 2014-2017.

Table 1 summarizes the PBF budget for 2014 (PBF assessment year). As mentioned above, the first PBF payment was allocated to the government. The largest budget items of the 2014 PBF budget was an investment into the supply chain. In addition, Gavi's first performance payment was used to pilot a results-based financing mechanism at community level.

Table 1: PBF budget for 2014 performance payment (2013 implementation year)

Objectives	Selected key activities	PBF Amount (US$)
Strengthen service delivery and improve quality of health services	• Health provider trainings • Produce, multiply and disseminate awareness-raising tools on immunization	133,179
Improve performance of district with low coverage rates with community-based organizations	• Verification costs • Set contracts with 63 community health workers	506,345
Ensure access to vaccines and management of supply chain, logistics, and safety of medical products and equipment	• Maintaining cold chain supply at all levels • New cold chain equipment & supplies • Transportation costs associated with receiving vaccines	688,121
Strengthen the health information system, monitor and evaluate community interventions	• Improving data quality and analysis • Strengthen technical capacity for data analysis	115,264
Program management	• Recruit a team for an impact evaluation • Purchase of projectors, computers	277,091

[11] There were budget lines in the UNICEF budget to show how the PBF payment (US$1.72) million was allocated: however, as reported by Gavi staff, this was a somewhat artificial divide. In fact, the PBF payment was fully consolidated with the third tranche of the HSS 2 grant (US$1.54 million).

[12] PBF budget data provided by Gavi.

	• Strengthen technical capacity	
Total		**1,720,000**

4. How important is Gavi's PBF for the country?

The **three interviewed country stakeholders** believe that Gavi's PBF is very important. On a scale from 1-4 with 1 the lowest relevance and 4 being highest relevance, Gavi's PBF was ranked as a 3.

The key informants argued that the PBF helped to strengthen the cold chain and helped to avoid stock-outs at subnational level. This particularly helped in terms of equitable coverage, as the improvements were targeted at districts that were lagging.

In addition, one important achievement of the first PBF payment was the financing of the results-based financing mechanism at community level. This pilot was evaluated in 2015 and proved the effectiveness of the community-based approach.[13] Due to this success, the pilot led to the development of a community-based strategy. There is now also a three-year scale-up process to roll it out in all provinces.

5. Was there a motivational effect? Did the PBF model incentivize the country to intensify its immunization efforts?

Country stakeholders argued that Gavi's PBF had a motivational effect. In this context it is important to mention again that it is difficult to differentiate between the effects of Gavi's general HSS funding and the PBF because the second payment was provided in a fully integrated way. In addition, before the political crisis, Gavi's core HSS funding was used to co-finance a broader pay-for-performance within the country. The key informants highlighted that Gavi contributed to the pay-for-performance system, which helped to improve the situation in various ways – for example, health centres became open 24hrs/7days, the quality of services improved because performance scores were given to evaluate health facilities regularly.

6. How effective has PBF been at improving coverage and equity?

When asked, country-level stakeholders in Burundi argued that Gavi's PBF has been successful. On a scale from 1-10, with 1 being a failure and 10 being the most successful, Gavi's PBF was ranked a 9 on average.

A review of immunization coverage indicators show that Burundi maintained its DTP3 coverage above 90% between 2012 and 2016 (Table 3). This is remarkable given that Burundi was still heavily affected by the political crisis, trying to stabilize itself. Because Gavi managed to provide its cash support through UNICEF, it allowed the country to maintain its coverage high and not to collapse entirely, which could have happened as other donors withdrew or freeze their support. As such, Burundi represents an important example on the use of performance payments.

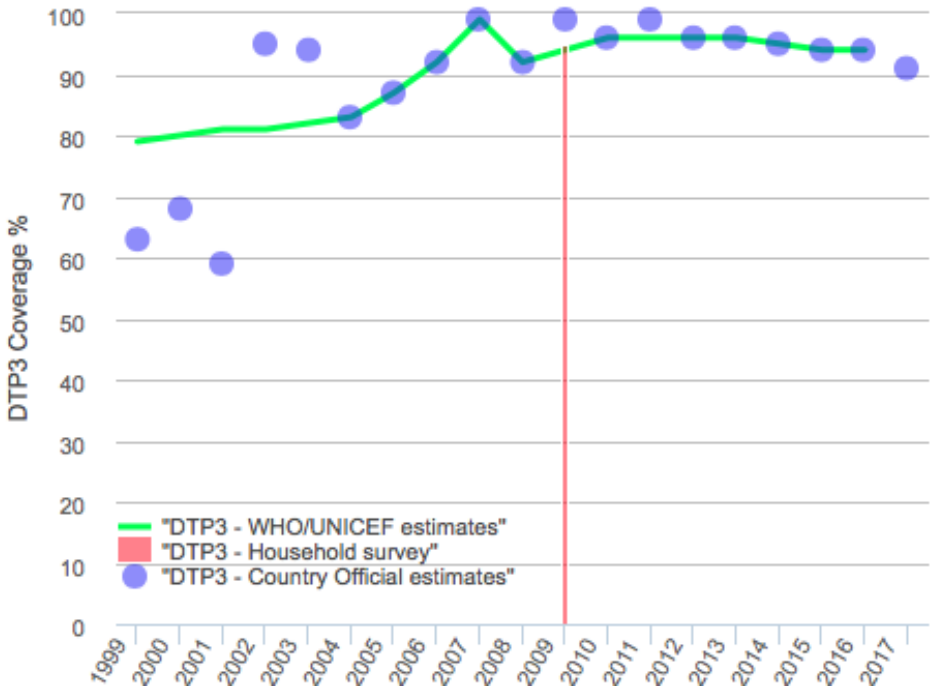
[13] www.fbpsanteburundi.bi/cside/contents/docs/Rapport_de_mise_en_oeuvre_du_Financement_Base_sur_la_Performance_et_la_gratuite_des_soins_pour_l_annee_2015.pdf

Equity (defined as the percentage of districts with at least 80% DTP3 coverage) fell from 93% in 2012 and 2013 to 84% in 2014 and 89% in 2015. It, however, returned again to 93% in 2016.

Table 3: Burundi's performance on key immunization coverage indicators

Burundi	2012	2013	2014	2015	2016
DTP3 coverage	96	96	95	94	94
Equity (% of districts with ≥80% DTP3 coverage)	93	93	84	89	93

Figure 1: Burundi's DTP3 coverage[1]



7. PBF Process: Management, alignment, oversight

Country stakeholders raised one concern in terms of alignment. They argued that Gavi's PBF only would provide performance payments based on immunization coverage. Interviewees argued that Gavi should consider a variety of indicators, especially those that are necessary to increase coverage but that are not rewarded through Gavi's PBF (e.g., mothers' awareness of immunization services and their importance, children's nutrition). Below are some illustrative quotes.

> "*Gavi's PBF approach was done in a silo: there is a focus on vaccines without integration of other health services necessary for children's health, for example children's nutrition.*"

> *"A health facility may have vaccines, but for a mother to bring her child to get vaccines she needs to be informed or be aware of such an opportunity."*

On a positive note, interviewees reported that “the quality of data has improved” thanks to the strict verification processes. Triangulation of data and quality of reporting has improved as well.

Conclusion

This deep dive has shown that Gavi’s PBF was important for Burundi. The first PBF payment was used to finance an effective community-based pilot – the approach is now being rolled out country-wide. In addition, Gavi – through UNICEF – provided important support in times of political crises, and as such helped to maintain coverage high. The latest joint appraisal document (2016) also suggests that Gavi’s general HSS support had an impact on the use of immunization services, and this assertion was also made by the key informants who we interviewed.

Sudan – 5th Deep Dive[14]

1. Overall HSS grant parameters

Gavi has approved two HSS grants for Sudan. HSS1 ran from 2008-2012—Gavi disbursed a total of $16.1 million to Sudan during this phase. The current HSS2 grant started in 2014 and will end in 2018. The total approved amount of this second HSS grant is US$25.3 million, of which US$16.4 million had been disbursed as of June 22, 2018.

As described below, HSS2 has four objectives (the HSS2 proposal was submitted to Gavi in 2013 and was thus developed in alignment with the Sudan National Health Sector Strategic Plan 2012-2016):

1. To improve sustainable and equitable access and use of quality immunization services as part of an integrated primary health care (PHC) focusing on underserved and disadvantaged populations.
2. To strengthen an integrated, comprehensive, efficient and sustainable health information system in support of evidence-based policy and planning.
3. To support production, equitable distribution and retention of a multi-tasked facility and community health workforce to meet immunization and PHC needs.
4. To strengthen management and leadership capacity of the decentralized health system at state and locality levels for an effective and efficient implementation of an integrated PHC package including EPI services.

HSS2 was developed in the context of several critical challenges facing Sudan, in particular (i) poor access to health facilities for pastoral communities and those living in conflict-affected areas; (ii) staff shortages and poor physical infrastructure at existing health facilities; (iii) a fragmented health information system; and (iv) major inequities in vaccine coverage.

2. PBF eligibility and performance payments

Sudan was assessed for eligibility to receive PBF grants between 2015 and 2017, and in that period, it qualified all three times (2015, 2016, and 2017). Sudan's DTP3 coverage was 93% in the baseline year (2013), and since then its DTP3 coverage has been maintained above 90%. The country therefore fell into Gavi's **high performance bracket during HSS2**.

Sudan has received a total of US$ 4.75 million in Gavi PBF awards over the three-year period. In each of the three years (2015, 2016, and 2017), it received an award of US$ 1.58 million for meeting its immunization targets in the previous implementation year. The annual awards were all DTP3 performance payments—Sudan received no equity payments. So far, US$ 2.58 million has been disbursed to the country, representing awards for 2015 and 2016.

3. How were the PBF payments used?

We were only able to interview one country stakeholder. As this key informant explained, Sudan saw the PBF awards as an "opportunity to fill finance gaps" in the health system. Most of the money was allocated to support direct immunization service delivery targeted at hard to reach areas such as Darfur. Some funds were also spent on health systems strengthening activities, such as improving

[14] In-country interview with Imadeldin Ahmed Mohammed Ismail.

health information systems and strengthening the cold chain system. Tables 1 and 2 below provide a summary of the allocation of PBF funds for years 2016 and 2017, respectively.

Table 1. Summary of budget for Sudan's 2016 PBF payment (2015 implementation year)

Gavi grant category	Amount	Sample activities
Service delivery	$ 889,917.76	• Provision of cold chain equipment • Acceleration of immunization activities in 31 low-coverage localities (with penta 3 less than 80% in 2015) and hard to reach areas • Conduct monthly outreach sessions • Conduct monthly mobile sessions • Conduct home visits for defaulters tracking and retrieval • Supportive supervision • Rented cars for mobile sessions and supervision
Procurement and supply chain management	$ 414,001.00	• Rehabilitate/upgrade four family health centers in four of the six target states • Conduct a study for civil work assessment (proposal writing, field work, data analysis and report writing) • Develop and disseminate guidelines and standard operating procedures to strengthen civil work operations
Workforce and human resources	$ 154,081.32	• Provision of monthly Incentive to decrease the high turnover of trained EPI focal persons • Incentives of EPI team (2 head of sections + 18 State EPI managers + 2 account officers)
Program management	$ 102,000.00	• Support recruitment of finance officers' contract with mechanical engineering to support management of vehicles and maintenance • Support 6 staff to attend regional/international procurement management training course • Fellowship for PMU staff on project management (8 staff for 3 weeks)
Management costs	$ 24,000.00	• Support grant management costs (stationery, fuel, maintenance etc.)
Total	$**1,584,000.08**	

Table 2. Summary of budget for Sudan's 2017 PBF payment (2016 implementation year)

Gavi grant category	Amount	Sample activities
Service delivery	$ 1,155,609.00	• Print and distribute the technical guidelines on vaccine-preventable diseases (VPDs) to all reporting sites in 18 states • Distribute quarterly bulletins to all partners • Conduct training of trainer workshops on VPDs surveillance for state surveillance officers and national medical officers • Design an integrated dashboard to be used in presentation of information • Conduct monthly outreach sessions to boost and sustain routine immunization coverage with 3 doses of penta 3 and measles > 90% among the special group populations (nomads, camps, refugees etc.) • Provision of lumbar puncture collection kits to all reporting sites for vaccine-preventable invasive bacterial disease surveillance • Support and design broadcast radio programs targeting disadvantaged communities to raise awareness and create demand • Conduct health system bottleneck analysis with focus on maternal and child health using DHSS approach • Provide locality health management teams in the target localities with basic office equipment and furniture
Capacity building of human resources	$ 25,000.00	• Build capacity of staff at all levels (federal, state, locality) in demand generation skills (design of messages, promotion skills, communication, etc.)
Procurement and supply chain management	$ 120,000.00	• Provide IEC equipment (laptop, DVD, screen, projector, speaker) to 60 target localities
Health information systems	$ 25,000.00	• Support the implementation of equity assessment in low performing states with focus on EPI and nutrition
Program management	$ 175,080.00	• Salaries for two finance staff (recruited under PBF year 1)
Total	**$1,500,689**	

4. How important is the PBF for the country?

The country level manager who we interviewed stated: "*In terms of immunization service and coverage, it [the PBF payments] has made a big difference in Sudan."*

In terms of the relevance of the PBF program to Sudan's needs, the manager ranked the program as 4 on a scale of 1 to 4, with 1 being lowest relevance and 4 being highest relevance. The manager argued that the program has contributed significantly in helping the country reach marginalized populations, especially those in conflict-affected areas. Sudan's ability to program the PBF funds to meet emerging challenges has provided some flexibility, enabling the immunization program to be more responsive to immediate problems.

The PBF program also provided an opportunity for the country to link immunization coverage to health systems strengthening. Sudan is currently in the midst of a public-sector wide reform that includes introduction of performance-based payments for staff salaries, hospital reimbursements, and other payments. Gavi's PBF approach aligns with this multi-sectoral strategy and with the ministry of health's current national strategic health financing approach, as outlined in the Republic of Sudan's National Health Policy 2017-2030.[15] The 2017-2030 policy aims to improve accountability at all levels of a decentralized health system including by developing and implementing "policies and strategies to guide shifting towards performance based systems linking finance and remuneration with performance at different levels."

5. Was there a motivational effect? Did the PBF model incentivize the country to intensify its immunization efforts?

Our key informant suggested that PBF had a motivational effect on immunization planning and implementation in Sudan. The interviewee argued that PBF was particularly important in helping the country focus on improving equity in immunization coverage—it encouraged efforts to reach the hardest to reach populations (e.g., conflict-affected areas, or low-density areas with nomadic populations). As described in section 6 below, equity actually worsened from 2013-2016, but the key informant argued that without PBF, coverage in conflict-affected areas would have been even worse.

PBF also helped the country to be more results-oriented. In the past, immunization efforts focused on inputs but now the focus has shifted towards measuring outputs.

6. How effective has PBF been at improving coverage and equity?

While Sudan has maintained its overall DTP3 coverage at over 90% during all three years in which it was assessed for PBF, it has *not* done well in terms of ensuring equity. In 2013, 93% of the subnational units (districts) in Sudan had DTP3 coverage greater than 80%, but this proportion fell sharply over time to just 82% in 2016. In the same period (2013-2016), MCV1 coverage has remained between 85% and 87%. Table 3 summarizes the immunization coverage rates for DTP3 and MCV1 in Sudan over this period.

[15] Federal Ministry of Health, Republic of Sudan. National Health Policy, 2017-2030. Available at http://www.nationalplanningcycles.org/planning-cycle/SDN.

The country manager acknowledged that it is difficult to separate the impact of PBF from the HSS grants because these programs work together. Yet the manager gave PBF an overall impact rating of 8 on a scale of 1 to 10, with 1 being failure and 10 being highly successful. When asked for evidence of PBF's success in Sudan, the manager responded this way:

> *"The evidence is the ability of Sudan's immunization program to still maintain its high coverage in spite of the challenges of reaching security challenged areas and areas outside government control. Even though the country failed to reach the equity award, without the funds, the situation would have been much worse."*

Table 3: Sudan's performance on key immunization coverage indicators, 2013-2016

	2013 (baseline)	2014	2015	2016
DTP3 coverage	93	94	93	93
Equity (% of districts with ≥ 80% DTP3 coverage)	93	90	83	82
MCV1	85	86	87	86

7. PBF process: management, alignment, and oversight

The country manager found the PBF and HSS processes to be straightforward, the templates user-friendly, and the processes aligned with existing national processes in Sudan. However, there have been three challenges:

- **Delays in receiving the PBF awards:** There are long time lags between the implementation year, the receipt of the award, and the final disbursement of Gavi's PBF funds. This extended time lag is in stark contrast to other PBF schemes (e.g. in the World Bank's results-based financing for health program or the Salud Mesoamerica Initiative, there is a shorter time between implementation year and receipt of the reward).
- **Delays in receiving funds:** These delays were distinct from Gavi's processes—they were mostly due to embargoes, sanctions, and financial transaction difficulties (a tranche of approved funds would typically take 3-6 months to be received).
- **Non-aligned monitoring systems:** Currently, Gavi asks for a monitoring framework for PBF that is different from the HSS monitoring framework, creating more work for countries.

8. Other concerns

The key informant raised two additional concerns about Gavi's PBF program. First, while it helps to maintain coverage in the short term it does not address long-term sustainability. Second, it fails to foster innovation:

> *"Increasing coverage helps in achieving immediate and short-term results (e.g. coverage) but does not address long term sustainability issues in a country like Sudan. And Gavi's PBF process does not encourage innovations. The initial/original plan was to support/encourage*

innovation, but later during the implementation, it seems the focus shifted to just doing the same things. Countries preferred to propose non-innovative but well-understood things because it was easier to get the grants that way. Innovative grants required a lot of back and forth with Gavi in Geneva to clarify issues before approval and so it was easier to just propose simpler activities and get the award with less stress."

The informant explained that under the current arrangement, if a country proposed something innovative that would potentially have significant impact in the country's context, Gavi required the proposal to pass through a painstaking process with burdensome paperwork. This barrier signals to the country that it was better to just propose "template" activities to make it easier to access the funds. The Sudan country manager sees this as a missed opportunity for local innovation.

Conclusion

Overall, our country key informant was mostly positive about Sudan's experience with the implementation of its Gavi PBF program, arguing that the PBF payments had a motivational effect on immunization planning and implementation. Sudan has maintained its DTP3 coverage at 93-94% from 2013-2016, though it is hard to know whether PBF itself had a role in achieving this (causality is difficult to prove). Gavi's PBF has aligned well with Sudan's broader health reform process, which has also used performed-based payments to promote accountability at multiple levels of the decentralized health system. However, equity, as defined by the proportion of districts with $\geq$ 80% DTP3 coverage, sharply fell over this time period.

Despite the informant's mostly positive experience, Sudan's PBF scheme has been beset with long time delays between implementation year and disbursement (such lags are known to reduce the effectiveness of PBF schemes). The lack of harmonization between monitoring of the PBF scheme and of the HSS grants has also been burdensome.

The Cochrane systematic review by Witter et al assessed the "current evidence for the effects of paying for performance on the provision of health care and health outcomes in low- and middle-income countries."[16] Nine studies met the inclusion criteria: one randomized controlled trial (RCT), six controlled before-and-after studies and two interrupted time series studies (see table below). The *interventions* varied between studies. One used a target payment (defined as a payment "for reaching a certain level of coverage, which can be defined in absolute terms or relative to a starting point") to improve quality of health care (Philippines [Peabody 2010[17]]); two used a target payment to drive increased coverage of services such as HIV testing and facility births (Tanzania [Canavan 2008[18]], Zambia [Vergeer 2008[19]]); three used conditional cash transfers plus quality measurements (Rwanda [Basinga 2010[20]], Burundi [Soeters 2009[21]] and the Democratic Republic of Congo [Soeters 2008[22]]); two used conditional cash transfers with no quality measures (Rwanda [Soeters 2005[23]], Vietnam [Quy 2003[24]]); and one used a combination of target payments and conditional cash transfers (China [Liu 2003[25]]). The *targets* also varied, and included prevention, inpatient and outpatient care, TB care, treatment of childhood illness, and hospital revenues; overall, there was a strong focus on women's and children's services. Witter and colleagues found that the studies were of low quality, with seven having a high risk of bias, one a moderate risk, and only one a low risk.

Seven studies reported on **service use**, and these had mixed results, as summarized in Table 3 of the main paper. Only one study measured actual **health outcomes**—of the four outcomes that were measured in this study, two showed improvement in the PBF intervention group and two did not. Three studies reported on **quality of care**, of which two studies—in the Philippines (Peabody 2010) and Rwanda (Basinga 2010)—found that PBF was associated with improved quality. The authors note that the third study, in China (Quy 2003), which found no improvements, was conducted over a short timeframe and this may have been too short to capture changes in quality.

[16] Witter S, Fretheim A, Kessy FL, Lindahl AK. Paying for performance to improve the delivery of health interventions in low- and middle-income countries. *Cochrane Database Syst Rev.* 2012 Feb 15;(2):CD007899.
[17] Peabody 2010 was unpublished at the time of the systematic review. It was later published as: Peabody JW, Shimkhada R, Quimbo S, Solon O, Javier X, McCulloch C. The impact of performance incentives on child health outcomes: results from a cluster randomized controlled trial in the Philippines. *Health Policy Plan.* 2014 Aug;29(5):615-21.
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