evidence action

Zambia Comprehensive Facility Survey Results & 2024 Program Coverage Estimation

May 2025

Content Outline

1. Comprehensive Facility Survey Background

What does the survey entail?

The 2025 Zambia Comprehensive Facility Survey contains five modules. See deep dive deck shared with GiveWell in Sept. 2024.

- **Module 1: Provider Skills and Knowledge - HIV & Syphilis Testing.** The goal of this module is to assess providers' knowledge of HIV and syphilis screening and counseling guidelines via clinical vignettes and direct knowledge questions, as well as assess providers' ability to utilize the dual test and interpret results correctly.
- **Module 2: Provider Skills and Knowledge - HIV & Syphilis Treatment.** The goal of this module is to assess providers' knowledge of HIV and syphilis treatment guidelines via clinical vignettes and direct knowledge questions, as well as understand patient behavior and refusal of treatment services.
- **Module 3: Test Supply Management.** The goal of this module is to assess the availability of testing commodities and understand facility-level supply management.
- **Module 4: Benzathine Penicillin Supply Management.** The goal of this module is to assess the availability of benzathine penicillin and understand facility-level supply management.
- **Module 5: Facility Source Records Review.** The goal of this module is to review facility records, primarily the ANC register and the HIA form, and collect data recorded for key indicators for November 2024, December 2024, and January 2025.

Sampling strategy

- **Sampling frame:** 837 trained health facilities
- **Sample size:** 44 health facilities; this number was selected to attain a 80% confidence level and 10% margin of error, based on conversations with GiveWell.
- **Sampling approach:** Facilities were selected using probability-proportionate-to-size sampling, based on the average number of 1st ANC visits per month at a facility in DHIS2. With this approach, larger facilities had a higher probability of being selected than smaller ones. A new sample will be drawn for each round of data collection.

Geographic distribution of sample facilities for the 2025 Comprehensive Facility Survey

Province	Phase 1 trained facilities *(sampling frame)*	Sampled facilities
Central	92	1
Copperbelt	81	5
Eastern	86	5
Luapula	70	1
Lusaka	105	13
Muchinga	80	4
Northern	81	9
Northwestern	69	3
Southern	93	2
Western	80	1
Total	**837**	**44**

Key differences between Zambia & Liberia

There are three main differences between Zambia and Liberia that impact the content of the Comprehensive Facility Survey and how the survey data is used to calculate key performance indicators:

(1) **The screening algorithm is more complex in Zambia**. In Liberia, the national guidelines state that all pregnant women who attend their 1st ANC should be tested for HIV and syphilis with the dual test. In contrast, in Zambia, only women who have an unknown HIV status should be tested with the dual test; women who are already known HIV+ *cannot* be screened with the dual test; a syphilis-only rapid test has to be used instead. For these reason, we used a different approach for calculating syphilis screening knowledge and availability of testing commodities (discussed in more detail in slides 9 and 12).

(2) **The ANC register is more comprehensive in Zambia**. In Liberia, the ANC register does not have a dedicated place for recording either syphilis screening or treatment. Therefore, we cannot systematically evaluate, patient-by-patient, if a pregnant woman who comes for antenatal care is tested and/or treated for syphilis. The opposite is true in Zambia -- we are able to assess both syphilis screening and treatment coverage directly from the ANC register, as there are labeled columns for recording this data.

(3) **Patient charts are not retained in Zambia**. In Liberia, because of gaps in the ANC register, to ascertain treatment we conduct a patient-by-patient chart review for any pregnant woman who tested positive for syphilis. We are unable to do the same in Zambia -- healthcare workers either record data directly into the ANC register during a woman's ANC visit or they use a half-sheet of paper, transcribe the data into the ANC register at the end of the day, and throw away the half-sheet.

2. Survey Results

Note in regard to interpretation

All survey results in this presentation are weighted by patient volume to increase the representativeness of the data at the patient level and better reflect the average experience of pregnant women across health facilities in Zambia. Since the number of patients served varies widely by facility, weighting ensures that higher-volume facilities have a greater influence on the overall estimates.

Patient volume weights are derived from the 2024 Zambia DHIS2 data, using the average number of monthly first antenatal care visits as a proxy. Where 2024 data were missing, we supplemented with DHIS2 data from 2021–2023.

Knowledge of syphilis testing guidelines

95% of surveyed healthcare providers recalled the correct guidelines for testing pregnant women for syphilis.

We calculated the overall indicator by averaging the results from two patient cases / clinical vignettes (using the ratio of women with unknown HIV status to women who are known HIV+):

1) 96% of providers correctly stated that they would request a Standard Q HIV/Syphilis Combo test or a syphilis-only rapid test for a pregnant woman who has an unknown HIV status at her 1st ANC appointment.
2) 85% of providers correctly stated that they would request a syphilis-only test for a pregnant woman at her 1st ANC appointment if she is already known HIV+.

We believe this approach is a more accurate reflection of how provider knowledge impacts syphilis testing in Zambia, given national guidelines which require different syphilis tests based on HIV status (see slide 6). A pregnant woman who is attending her first ANC either has unknown HIV status or she is known HIV positive – she cannot be both. Therefore, knowledge of testing guidelines in the first case would affect testing in the instances where someone doesn't know their HIV status (95% of pregnant women have an unknown status at 1st ANC). Conversely, knowledge of testing guidelines in the second case would affect testing in the instances where someone is known HIV+ at her first ANC (5% of pregnant women are known HIV+ at first ANC). Thus, we applied the rate of known HIV positivity* in doing a weighted average of these two underlying indicators. Final calculation: 95% = (96% * 95%) + (85% * 5%)

*We estimated the fraction of pregnant women who are known HIV+ at 1st ANC by using the DHIS2 data. The # of women known HIV+ is reported monthly; averaging the 2021-2024 DHIS2 data across all facilities, we found 5% of pregnant women were known HIV+.

Knowledge of syphilis treatment guidelines

100% of surveyed healthcare providers recalled the correct guidelines for treating syphilis-positive pregnant women.

We calculated the overall indicator by averaging the results from two patient cases / clinical vignettes (using the ratio of syphilis-only infections to HIV and syphilis co-infections):

1) 100% of providers said they would treat a pregnant woman who is positive for syphilis with at least benzathine penicillin.
2) 99% of providers said they would treat a pregnant woman who is positive for HIV and syphilis (co-infected) with at least benzathine penicillin.

The combined average across the two vignettes is a more accurate representation of providers' knowledge of syphilis treatment. A pregnant woman cannot be both syphilis-only and co-infected with HIV; she must be one or the other. Therefore, knowledge of treatment guidelines in the first case (syphilis only infection) would affect treatment in the instances where someone only has syphilis. Conversely, knowledge of treatment guidelines in the second case (co-infection) would affect treatment in the instances where someone has HIV and syphilis. Thus, we applied the co-infection rate* in doing a weighted average of these two indicators. Final calculation: 100% = (100% * 88%) + (99% * 12%)

*We estimated the co-infection rate using data collected from the ANC register during the Comprehensive Facility Survey. HIV and syphilis co-infection is not an indicator reported in DHIS2, but it is an indicator we extracted from the ANC registers at surveyed health facilities. Based on that data extraction, 12% of syphilis-positive pregnant women are also infected with HIV.

Consent to syphilis testing and treatment

94% of surveyed healthcare providers reported that no pregnant women had refused syphilis testing in the three months preceding the survey.

83% of surveyed healthcare providers reported that no syphilis-positive pregnant woman had refused treatment in the three months preceding the survey.

Syphilis testing availability

97% of surveyed health facilities had syphilis testing commodities in stock to screen ANC-going pregnant women irrespective of their HIV status

Stock estimates are based on a room-by-room assessment, in which enumerators physically searched all facility rooms (e.g., ANC consultation rooms, storage areas) for non-expired dual tests and syphilis-only rapid tests. A facility was considered to have stock if non-expired commodities were found in at least one room.

Because the Zambia national guidelines require different syphilis tests based on HIV status (see slide 6), we calculated the overall indicator by averaging different availability scenarios (using the ratio of women with unknown HIV status to women who are known HIV+):

1) A pregnant woman who has an unknown HIV status at her 1st ANC visit can be tested for syphilis with either a dual test *or* a syphilis-only rapid test; 97% of surveyed health facilities had non-expired dual tests *or* syphilis-only tests in stock on the day of the survey. Reminder, 95% of ANC-going pregnant women have an unknown HIV status at 1st ANC.
2) A pregnant woman who is known HIV+ at her 1st ANC visit can only be tested for syphilis with a syphilis-only rapid test; 84% of surveyed health facilities had non-expired syphilis-only rapid tests available on the day of the survey. Reminder, 5% of ANC-going pregnant women are known HIV+.

Final calculation: 97% = (97% * 95%) + (84% * 5%)

Benzathine penicillin availability

94% of surveyed health facilities had non-expired benzathine penicillin in stock on the day of the survey.

Stock estimates are based on a room-by-room assessment, in which enumerators physically searched all facility rooms (e.g., ANC consultation rooms, storage areas) for non-expired benzathine penicillin. A facility was considered to have stock if non-expired commodities were found in at least one room.

Data quality assurance (DQA)

We also conducted a data quality assurance (DQA) assessment. In it, we took what enumerators counted from the ANC register for each of the key indicators and compare this to what the facility reported for the same indicators in the DHIS2. The outcome is an estimate of the 'DQA adjustment factor' which captures the extent to which the DHIS2 over- or under- estimates the indicator compared to what was documented by healthcare providers in the ANC register. For the DQA, we have 132 total observations possible. Each of these observations represents a comparison between the facility records and DHIS2 for one facility in one month (44 facilities * 3 months = 132 observations).

Indicator	% of data available in ANC Register	% of data available in DHIS2	Combined availability	Adjustment factor
# of pregnant women attending 1st ANC	100% (132 / 132)	100% (132 / 132)	100% (132 / 132)	0.93
# of pregnant women tested for syphilis at 1st ANC	100% (132 / 132)	95% (126 / 132)	95% (126 / 132)	0.97
# of pregnant women tested positive for syphilis	100% (132 / 132)	94%[1] (124 / 132)	94% (124 / 132)	0.91
# of syphilis-positive pregnant women treated with benzathine penicillin	100% (132 / 132)	97%[1] (128 / 132)	97% (128 / 132)	0.86

[1] In the DHIS2, 33/44 facilities had at least one month of missing data for syphilis positivity and 31/44 facilities had at least one month of missing data for syphilis treatment, much more missing data than for syphilis testing, despite all of these indicators coming from the same place in the ANC register and monthly reporting form. Looking at our data extraction, we saw that most of these cases of missing data were instances where the enumerators also did not find any syphilis-positive women or any records of treatment for the given month. In discussions with our M&E staff in Zambia, we learned that facilities may often forgo entering '0' in the DHIS2 and instead leaving it blank. Thus, we imputed a '0' for all missing data for syphilis positivity and treatment for the DHIS2 output. Without this assumption, DHIS2 data availability for syphilis positivity and treatment is 75% and 77%, respectively, and would have fallen below the threshold for acceptable use of the DQA results.

3. Coverage Estimation Among Trained Facilities

Goals in coverage estimation

A key focus of the Comprehensive Facility Survey is to collect data to enable the program to understand its impact. Specifically, we want to estimate the fraction (and number) of ANC-going pregnant women who are tested for syphilis and the fraction (and number) of ANC-going, syphilis-positive pregnant women who receive appropriate treatment.

To do this, we need to estimate four key indicators.

1. **ANC coverage**: Number of pregnant women attending 1st ANC
2. **Syphilis screening coverage**: Number and percent of pregnant women who were tested for syphilis at 1st ANC
3. **Syphilis prevalence**: Number and percent of pregnant women who tested positive for syphilis
4. **Treatment coverage**: Number and percent of syphilis-positive pregnant women who were treated with benzathine penicillin

In the following slides, we present various methodologies for estimating each indicator and our rationale for deferring to specific approaches.

Our preferred approach for estimating coverage is using the DQA

Our first preference is to combine DHIS2 data with the data quality assurance (DQA) adjustment factor. In this approach, we compare the number reported in DHIS2 to the number counted by enumerators for each 'facility-month' of extracted data in the Comprehensive Facility Survey. We use these findings to calculate an indicator-specific adjustment factor – the extent to which the DHIS2 data is under-reporting or over-reporting the data recorded in the ANC register (see slide 14). We then multiply each key indicator by its adjustment factor, resulting in the total who attended 1st ANC, the total who were tested for syphilis, the total who tested positive for syphilis, and the total treated for syphilis. These totals are then divided to obtain the syphilis screening, prevalence, and treatment rates.

We defined a threshold that the preferred approach is used *only* if at least 80% of the 'facility-month' data is available in *both* the source record (the ANC register) and the DHIS2 across all surveyed facilities. Note: We exceeded this threshold (see slide 14).

Estimated coverage among trained facilities using the preferred DQA approach

Applying the DQA adjustment factors to each indicator, we find that, among trained health facilities in 2024:

201,592 1st ANC attendees in DHIS2 X 0.93 adjustment factor = 188,161 pregnant women attended 1st ANC

174,784 pregnant women tested for syphilis in DHIS2 X 0.97 adjustment factor = 169,685 pregnant women tested for syphilis

14,724 pregnant women tested positive for syphilis in DHIS2 X 0.91 adjustment factor = 13,463 pregnant women tested positive for syphilis

13,309 pregnant women treated for syphilis in DHIS2 X 0.86 adjustment factor = 11,471 pregnant women treated for syphilis

Therefore, **90% of all ANC-going pregnant women were tested for syphilis at trained health facilities** (169,685 / 188,161)

7.9% of pregnant women were found positive for syphilis at trained health facilities (13,463 / 169,685)

85% of syphilis-positive pregnant women were treated for syphilis at trained health facilities (11,471 / 13,463)

Note: The DHIS2 data only includes data for trained facilities in the months *after* their training. For example, for a facility trained in April, we only totaled each indicator beginning in May. Then, for a facility trained in May, we only totaled each indicator beginning in June. And so on. Phase 1 of training began in Apr 2024 and concluded in Oct 2024.

Our alternative approach for estimating coverage is using the ANC register

If we do not meet the threshold for data availability for the DQA, then we would seek to use the ANC register findings directly.

In this approach, we would evaluate the screening, prevalence, and treatment rates directly from the ANC register for each facility. For each 1st ANC attendee recorded in the register, we would count how many had a syphilis test result, and, thereby have a screening coverage rate. We would also count how many tested positive for syphilis out of those tests, and, thereby calculate syphilis prevalence. Finally, for each ANC client who was positive for syphilis, we would count how many were treated with at least one dose of benzathine penicillin, and, thereby have a treatment coverage rate.

We defined a threshold that the preferred approach is used *only* if at least 80% of 'facility-month' data is available in the ANC register for both indicators. Note: We exceeded this threshold; we had 100% of the 'facility-month' data for every indicator.

Estimating coverage among trained facilities using alternate approach of the ANC register

In using the ANC register, we first calculated the total number of pregnant women who attended 1st ANC, were tested for syphilis, were positive for syphilis, and were treated with benzathine penicillin across all three months (November + December + January). Then, for each facility, we calculated the screening rate, syphilis prevalence rate, and treatment rate independently. In other words, syphilis screening at Chipata First Level Hospital is equal to the number of women who were tested for syphilis at Chipata from November 2024 to January 2025 divided by the number of women who attended 1st ANC at Redemption during the same period. We then took each facility's rates and calculated an overall average for each indicator weighted by the patient volume at each facility. The final estimates, based on the ANC register, are:

97% of pregnant women who attended 1st ANC were tested for syphilis at trained health facilities

6.7% of pregnant women were found positive for syphilis at trained health facilities

90% of syphilis-positive pregnant women were treated for syphilis at trained health facilities

Worst case scenario, we would revert to our approach in Liberia

If we do not meet the threshold necessary for either the preferred DQA approach or the alternative ANC register approach, we would then mirror our alternate strategy in Liberia where we **use the process of "triangulation" to determine coverage rates by multiplying the process indicators which drive coverage.**

Syphilis screening coverage	=	% of facilities with syphilis testing available	*	% of providers who know syphilis screening guidelines	*	% of pregnant women who consent to screening
Syphilis treatment coverage	=	% of facilities with benzathine penicillin available	*	% of providers who know syphilis treatment guidelines	*	% of syphilis-positive pregnant women who consent to treatment

Outcome of triangulation

Although we were able to use our preferred approaches for estimating coverage among trained health facilities, we still produced an estimate using the triangulation approach for the sake of understanding the consistency among our findings.

Syphilis screening coverage	Syphilis treatment coverage
95% of surveyed healthcare providers recalled the correct guidelines for testing pregnant women for syphilis	100% of surveyed healthcare providers recalled the correct guidelines for treating syphilis- positive pregnant women
97% of surveyed health facilities had syphilis testing commodities in stock to screen ANC-going pregnant women irrespective of their HIV status	94% of surveyed health facilities had non-expired benzathine penicillin in stock on the day of the survey.
94% of surveyed healthcare providers reported that no pregnant women had refused syphilis testing in the three months preceding the survey	83% of surveyed healthcare providers reported that no syphilis-positive pregnant woman had refused treatment in the three months preceding the survey
86% of ANC-going pregnant women were tested for syphilis among trained health facilities (86% = 95% * 97% * 94%)	**78% of syphilis-positive pregnant women were treated among trained health facilities** (78% = 100% * 94% * 83%)

Key takeaways and how the different coverage estimation approaches compare

Key takeaway #1: Syphilis screening and treatment rates are both high, regardless of what methodology we use to estimate coverage rates. Among trained health facilities, most pregnant women are receiving the syphilis services they need.

Key takeaway #2: Syphilis prevalence is much higher in Zambia than we had initially believed (we estimated 3.0% of pregnant women had active syphilis based on the 2016 ZAMPHIA survey; see scoping report). This makes our work so much more critical to the health of women and newborns in Zambia.

Indicator	Preferred DQA Approach	Alternate ANC Register Approach	Back-Up Triangulation Approach
Syphilis screening coverage: % of ANC-going pregnant women who are tested for syphilis among trained facilities	90%	97%	86%
Syphilis prevalence: % of pregnant women who test positive for syphilis among trained facilities	7.9%	6.7%	n/a
Treatment coverage: % of syphilis-positive pregnant women who are treated with benzathine penicillin among trained facilities	85%	90%	78%

4. Extrapolating to National Coverage

Background

For purposes of cost-effectiveness modeling, we don't just want to know coverage among trained health facilities (slide 23), but we also want to know what % of **all** ANC-going pregnant women in Zambia are being screened and treated for syphilis. As a consequence, we need to extrapolate our survey findings to untrained health facilities. This is because:

- Unlike Liberia, in Zambia, there was some level of syphilis screening prior to adoption of dual testing; based on DHIS2 data, approx. 45% of ANC-going pregnant women were tested for syphilis before dual test adoption.* If we do not account for testing among non-trained facilities, we would be underestimating overall coverage.
- We believe that our program impact extended beyond trained facilities. By orchestrating a commodity push of syphilis tests and benz. pen. and by more actively engaging the provincial and district health teams in efforts toward congenital syphilis elimination, we triggered more proactivity on their end. Based on anecdotal evidence and trends we see in the DHIS2 data, we believe that more facilities were activated to do dual testing than we had strictly trained.

The following slides propose an approach for extrapolating our survey data to national coverage.

*Looking in the DHIS2, 44% of ANC-going pregnant women were tested for syphilis in 2021 and 46% were in 2022.

Recommended strategy for estimating national coverage per indicator

To extrapolate national coverage estimates using data from the Comprehensive Facility Survey, we recommend using the following approaches for each of the key program indicators:

1. **ANC coverage: Utilize the DQA results across the board.** In this approach, we would apply the same DQA adjustment factor to all 1st ANC data, regardless of whether it is a trained or untrained health facility. We do not expect ANC data entry practices to differ significantly between trained and untrained sites, as the training does not explicitly focus on this. The DQA adjustment factor would therefore be relevant across trained and untrained sites.
2. **Syphilis screening coverage**: **Utilize the DQA results across the board but conduct a sensitivity analysis for untrained facilities**. In this approach, we would similarly apply the same DQA adjustment factor to all syphilis testing data, regardless of whether it is a trained or untrained health facility. We recognize that this may result in an overestimate of screening among untrained health facilities -- we expect data recording/reporting practices for syphilis testing to be somewhat impacted by training (in other words, we would expect trained sites to potentially have more accurate data than untrained sites). Because our DQA adjustment factor suggests that trained facilities are over-reporting, we could suspect that an untrained facility is over-reporting even more than a trained facility. Thus, we've conducted a sensitivity analysis to understand the impact of our assumptions on overall national screening coverage (see slide 29).

Recommended strategy for estimating national coverage per indicator, contd

To extrapolate national coverage estimates using data from the Comprehensive Facility Survey, we recommend using the following approaches for each of the key program indicators (continued from previous slide):

3. **Syphilis prevalence: Utilize the ANC register.** In this approach, we would assume that prevalence nationally is equal to prevalence among the surveyed sites as measured in the ANC register (slide 20). We do not believe that syphilis prevalence is a function of our program. Therefore, extrapolating syphilis prevalence measured from the ANC registers allows us to exclude variations in reporting between trained and untrained sites.
4. **Treatment coverage: Utilize the DQA approach across the board but conduct a sensitivity analysis for untrained facilities.** In this approach, we would similarly apply the same DQA adjustment factor to all syphilis treatment data, regardless of whether it is a trained or untrained health facility. We recognize that this may result in an overestimate of treatment among untrained health facilities -- we expect data recording/reporting practices for syphilis treatment to be somewhat impacted by training (in other words, we would expect trained sites to potentially have more accurate treatment data than untrained sites). Because our DQA adjustment factor suggests that trained facilities are over- reporting, we could suspect that an untrained facility is over-reporting even more than a trained facility. Thus, we've conducted a sensitivity analysis to understand the impact of our assumptions on overall national treatment coverage (see slide 29).

Estimated national coverage in 2024

Applying the methodologies discussed in slides 26 and 27, we find:

Indicator	Total Reached Nationally	Approach / Formula
# of pregnant women attending 1st ANC[2]	769,573	DQA; 824,506 1st ANC attendees in DHIS2 x 0.93 adjustment factor
# of pregnant women tested for syphilis at 1st ANC	575,648	DQA; 592,948 pregnant women tested for syphilis in DHIS2 x 0.97 adjustment factor
# of pregnant women tested positive for syphilis	38,568	ANC register; previous row x 6.7% prevalence
# of syphilis-positive pregnant women treated with benzathine penicillin	33,110	DQA; 38,415 pregnant women treated for syphilis in DHIS2 x 0.93 adjustment factor

Thus, **75% of all ANC-going pregnant *throughout* Zambia were tested for syphilis in 2024**. And, **86% of all syphilis-positive pregnant women were treated for syphilis *throughout* Zambia in 2024**.

Sensitivity analysis of the DQA factor for untrained facilities

As noted in slides 26 and 27, by applying the DQA to untrained sites, we are assuming that they have the same level of data recording / reporting error as trained sites. If we assume that our training improved data recording / reporting practices for syphilis indicators, and with the DQA adjustment factor suggesting that trained facilities are over-reporting, we might suspect that an untrained facility is over-reporting even more. To explore this, we assess how estimates change when the adjustment factor for untrained facilities is varied by -5% and -10%. In the scenarios below, the predetermined adjustment factor is applied to trained facilities, while the adjustment factor for untrained facilities is adjusted by -5% or -10%. Based on this analysis, we see that screening coverage falls slightly if we assume even worse reporting among untrained sites but treatment coverage remains unchanged.

	Same adjustment to trained & untrained facilities		**Untrained facilities over-report by 5% *more* than trained facilities**		**Untrained facilities over-report by 10% *more* than trained facilities**	
Indicator	Adjusted #	Coverage	Adjusted #	Coverage	Adjusted #	Coverage
# of pregnant women tested for syphilis at 1st ANC	575,648	**75%** (of ANC-going* pregnant women)	554,740	**72%** (of ANC-going* pregnant women)	533,832	**69%** (of ANC-going* pregnant women)
# of syphilis-positive pregnant women treated with benzathine penicillin	33,110	**86%** (of syphilis-positive** pregnant women)	31,855	**86%** (of syphilis-positive** pregnant women)	30,600	**86%** (of syphilis-positive** pregnant women)

*The number of ANC-going pregnant women (the denominator for screening coverage) is calculated by applying the same DQA factor to trained and untrained facilities, since we do not expect our training to impact the quality of recording / reporting related to ANC visits.
**The number of syphilis-positive pregnant women (the denominator for treatment coverage) is calculated by multiplying the # of pregnant women tested for syphilis in the previous row by the prevalence measured via the ANC register (6.7%), since we do not suspect that prevalence differs across trained and untrained sites.

5. Lessons Learned

Lesson 1: SurveyCTO data quality controls & restrictions led to improvements

Leveraging our learnings from Liberia's Comprehensive Facility Survey, we integrated measures into SurveyCTO to improve the quality and internal consistency of data collected by enumerators in Zambia. To do this, **we integrated response restrictions (e.g. there cannot be more women testing positive for syphilis than 1st ANC attendees) and quality checks to note inconsistencies and oddities to the enumerator during data collection.** In the event that an issue is noted, the enumerator received a message that: (1) explains the inconsistency found, and (2) prompts the enumerator to double-check their responses and make corrections as needed. The specific areas where we added in the response restrictions and flags were:

1. Inconsistencies between whether the enumerator saw testing commodities (HIV/syphilis dual tests and syphilis-only rapid tests) at the facility and the staff's recall of stockouts for the commodities.
2. Inconsistencies between whether the enumerator saw benzathine penicillin at the facility, staff's recall of stockouts for the commodities, and the results of reviewing the stock cards.
3. Numeric restrictions prohibiting enumerators from entering a higher number of syphilis tests, positive results, and syphilis treatments as compared to the number of clients attending 1st ANC when reviewing the ANC register.

Lesson 2: High-frequency data checks helped us monitor real-time data collection concerns

We implemented a comprehensive high-frequency check of data as it was collected in real-time – **allowing for faster and more efficient feedback and collaboration with the enumeration firm.** The questions selected for the high-frequency check were primarily those which are used for estimating syphilis screening and treatment coverage. In the high-frequency checks, we evaluated data completeness and data coherency (e.g. consistency in responses across modules for questions which relate to similar issues).

The results of these high-frequency checks were discussed in weekly check-ins with the enumeration firm to guide our discussions and feedback. These checks helped us to:

(1) Seek clarification for why HIA forms were not found at health facilities, including understanding where an indicator was counted as “0” vs. where a “0” was entered because there was no record found;

(2) Compare incoming facility data with existing DHIS2 data to identify facilities where backchecks were needed; and,

(3) Gain increased confidence in the data early on – **enabling us to more quickly and efficiently wrap up the data collection and cleaning processes.**

Lesson 3: We confirmed that patient charts are not kept at Zambia health facilities

During scoping and pilot activities in Zambia, the Evidence Action team could not confirm whether patient charts are typically used or stored at health facilities. In contrast, in Liberia, enumerators use patient charts during the Comprehensive Facility Survey to verify syphilis-positive results in facility registers and confirm treatment with benzathine penicillin. Therefore, we included a patient chart review section in the Zambia Comprehensive Facility Survey to assess whether syphilis positivity and treatment can be validated through patient charts or other facility records.

Across the 44 surveyed facilities in Zambia, we found 656 syphilis-positive pregnant women recorded in ANC registers. However, we were able to locate patient charts or records to verify syphilis positivity for only 34 of these women and treatment for 3 of them. All of the supplementary records we found confirmed the data in the ANC register.

Fortunately, the ANC register in Zambia contains dedicated fields for healthcare providers to record syphilis test results and treatment with benzathine penicillin. Across all 44 surveyed facilities, these fields were consistently completed. For all 3 clients where treatment was found in patient charts, their treatment was also recorded in the ANC register. Thus, **we will utilize ANC register data – rather than patient charts – to estimate syphilis prevalence and treatment coverage in Zambia and will drop patient chart review in future iterations of the Zambia Comprehensive Facility Survey.**

Thank you!