

A Comparison of **ESPEN Collect** and **ONA.io** as Two Potential Electronic Data Capture (EDC) Platforms during Neglected Tropical Disease (NTD) Disease-Specific Assessments (DSAs) in USAID's **Act to End NTDs | West** Countries

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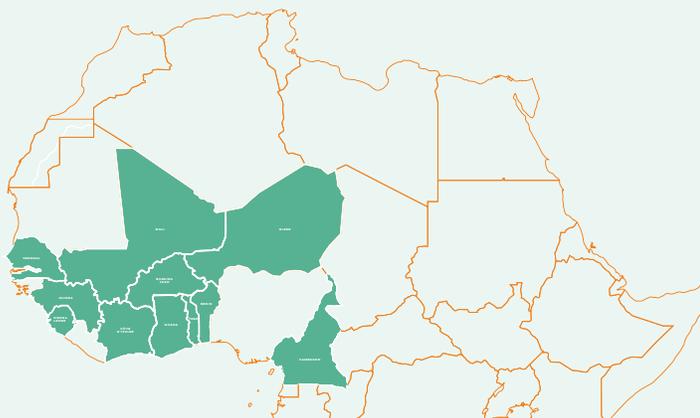
KEY FINDINGS AND RECOMMENDATIONS

ELECTRONIC DATA CAPTURE (EDC) PILOT FINDINGS

- Both ESPEN Collect and ONA.io platforms proved capable of supporting timely, high quality data collection for field surveys.
- Both platforms were identical in terms of phone/tablet functionality, questionnaire customization, and data security.
- ESPEN Collect offered services ONA.io did not, including training on the EDC platform, protocol and questionnaire review, customized dashboard generation, live monitoring during fieldwork to track field progress and detect errors, management-oriented email updates during fieldwork, and auto-population of the World Health Organization (WHO) Epidemiological Reporting Form (EPIRF).

RECOMMENDATIONS FOR ACT WEST SURVEYS WISHING TO USE EDC PLATFORMS FOR DISEASE SPECIFIC ASSESSMENTS (DSAS)

- National neglected tropical disease (NTD) programs and in-country implementers should continue using their current EDC platforms if they are familiar and satisfied with them.
- When considering adopting a new EDC platform, survey organizers are encouraged to consult this report to help choose the most appropriate platform, given the country context.
- Regardless of the platform, EDC provides a vast improvement in the ultimate data quality for DSAs over traditional paper-based data collection—and therefore, the use of EDC platforms should always be promoted for DSA data collections.



OBJECTIVE

This report is intended to inform future decisions by Africa-based implementing partners within USAID's Act to End Neglected Tropical Diseases (NTDs) | West (Act | West) and African Neglected Tropical Disease Programs (NTDPs) who wish to adopt EDC platforms for upcoming DSAs but require more information before doing so. To this end, this report documents and compares experiences from March to December 2020 of Act | West implementing partners and NTDPs conducting largely standardized DSA surveys using two popular EDC platforms in the neglected tropical disease space: ESPEN Collect and ONA.io.

EDC Context in Africa

Data collection and analysis are critical to effective program management and development, advocacy efforts and resource mobilization, policy implementation, and monitoring of interventions for NTD programs. The data can be collected through electronic software (i.e., EDC), replacing older paper-based mechanisms. With the advent of EDC systems, a shift away from paper has been an essential means of improving data quality. Advantages include the ability to code questionnaire flows, skips, and filters into tablets or smartphones; the ability to enter data directly during fieldwork; the mitigation and rectification of obvious coherence and consistency errors in real or near real time during fieldwork; the facilitation of near real time data transmission (depending on Internet availability) to a central office; the assurance of data security using encryption; and the minimization of data loss.

Many electronic data collection tools offer control and validation features and allow for geo-referencing, while facilitating the collection of demographic and biophysical data in the field, all at a low or no cost. Selecting the right platform among a multitude of options can be daunting. Many countries pilot EDC platforms on one or two surveys, but it benefits countries to consider the varying strengths and challenges of each EDC platform before making a final decision on choice of platform.

Countries all over the world have been using EDC for NTD surveys on an as-needed basis, often purchasing limited time subscriptions to commercial platforms such as CommCare and ONA.io or using the mobile data collection feature of Ministry of Health (MoH) instances of DHIS2 (such as DHIS2 Collect).

Within the preventive chemotherapy (PC) NTD world, implementers and NTDPs have adopted EDC but not uniformly. For instance, until 2016, the Global Trachoma Mapping Project (GTMP) conducted standardized trachoma mapping surveys in 29 countries using EDC through Android phones. GTMP was succeeded by the WHO-led Tropical Data initiative, which continues to use EDC and is the group responsible for trachoma DSA data collection and analysis for most of the NTD world. However, the End in Africa program, led by FHI 360 from 2010–2018, supported DSA data collection in its six countries using paper-based vehicles until the end of the program, so EDC was not introduced in those countries until the beginning of Act | West program.

The Act | West program (the successor project to End in Africa, which commenced in 2018 and supports 11 West African countries), systematically promotes the use of EDC for DSA surveys due to its advantages in improving data quality, timeliness

of data availability, and enhanced data security and storage. It is in this context that ESPEN Collect has been recently used in Ivory Coast (preTAS), Benin (preTAS and TAS2) and Senegal (preTAS), while ONA.io has been used in Niger (preTAS) and Cameroon (TAS).

ESPEN (Expanded Special Project for the Elimination of Neglected Tropical Diseases) is the African regional arm of WHO and supports the activities of eliminating NTDs that respond to preventive chemotherapy. In collaboration with other NTDs partners, ESPEN developed ESPEN Collect, a free mobile data collection tool and set of services, mainly for the DSA surveys on lymphatic filariasis (LF), onchocerciasis (OV), schistosomiasis (SCH) and soil-transmitted helminths (STH). As part of the package of services offered, ESPEN reviews survey protocols, trains on the ESPEN Collect tool, provides a limited number of smartphones for data collection, manages the ESPEN server, assists with questionnaire setup before fieldwork, assists with data monitoring and troubleshooting during fieldwork, and undertakes limited data cleaning after fieldwork. In addition, ESPEN designed a dashboard for data managers, supervisors, monitoring and evaluation (M&E) teams, and program managers to monitor data collection and data quality. This service is free to countries and uses open-source software Metabase¹ to visualize data in real time.

Beyond training, setup, support, collection, storage, and use, an optimal EDC platform should provide integration with external systems. One of the reasons for the success of the Tropical Data trachoma platform is the tight integration with annual reporting through the WHO Trachoma Elimination Monitoring Form (TEMF). Programs that use Tropical Data can automatically have their data added to the Get2020 database and incorporated into the TEMF. Similarly, for other diseases, this same integration with annual reporting forms is available; that is, survey results using ESPEN Collect

are automatically populated into the WHO EPIRF. The completed form is sent to the national program where it is reviewed, signed, and submitted to WHO as official national data. Without this integration, these annual reporting forms have low rates of submission to WHO, which makes it difficult to determine appropriate treatment strategies and achieve elimination goals for the various NTDs.

ONA.io is a popular data collection tool used across international development sectors and diseases, including NTDs. ONA.io was founded in 2013 and has offices in the United States and Kenya, with a mission to build “equitable access to essential services through data, technology and design.”² ONA.io’s services are commercially available worldwide, with certain tools available free of charge within limits of use. Notably, mobile data collection is free for surveys requiring fewer than 500 submissions per month and 10 or fewer distinct questionnaires (hereafter referred to as “forms”). Higher limits are available (greater than 500 but fewer than 5,000 submissions per month, and greater than 10 but fewer than 15 distinct questionnaires, sufficient for multiple preTAS/TAS EUs) for USD 99/month at the time of this report.³ This service level includes use of the data collection mobile app and access to a website to manage questionnaires, receive, view, and edit data. It offers a “do it yourself” form builder to create questionnaires, as well as the option to use existing questionnaires. While written guidance for these functions is provided, ONA.io does not provide NTD-specific in-person training or troubleshooting, pre-made NTD questionnaires, data management or a dashboard at the free or USD 99/month access level. However, non-NTD specific services for data management and dashboarding are available at an additional cost.

1 <https://www.metabase.com/docs/latest/users-guide/01-what-is-metabase.html>, Accessed June 10, 2021

2 <https://company.ona.io/about/mission-vision/> Accessed April 8, 2021

3 <https://company.ona.io/products/ona-data/pricing/> Accessed April 8, 2021

Pilot Overview

Given that various countries within the Act | West Project indicated a desire to move towards EDC for DSA data collection, a pilot was undertaken to compare the basic features of ESPEN Collect and ONA.io. These documented experiences serve as informative guidance to other countries wishing to use an EDC system for future NTD DSAs. The pilot period began in March 2020 and concluded in December 2020. Although countries themselves selected their preferred EDC platform to use for their DSA data collections, Act | West headquarters Monitoring, Evaluation and Learning (MEL) staff selected country offices to include in this report by applying the following criteria:

- The DSA survey activity was approved in Act | West FY20/21 workplans
- The DSA survey activity utilized largely standardized questionnaires and processes (surveys relating to operations research and one-off initiatives were excluded)
- The NTDP was willing to use one of the two systems and share monitoring feedback in the preparation for this report.

The platform pilots for collecting EDC survey data were evaluated based on the ability to provide appropriate data security systems and data sharing agreements, as well as ability to provide quality services, such as the following:

- Installation of and training on the ESPEN Collect application, either remotely or in person, prior to fieldwork
- Real-time daily remote data upload monitoring, remote troubleshooting with data errors and uploads, and basic data cleaning support relating to duplicates and/or omission of records during fieldwork
- Secure and continuous access to real-time data, dashboards, and summary results made available to MOHs and ministry-approved partners during fieldwork

- Ability of the platform to be adapted to different survey and country contexts, respond to a surge in demand for services, and strengthen country capacity and ministry ownership for all stages of the survey process.

Several of the initially planned DSAs were postponed due to the COVID-19 pandemic. The final list of countries and surveys included in the pilot is below.

TABLE 1. Pilot survey activities and countries

Platform	Disease	Survey Type	Country	Act West Implementing Partner	Start Date
ESPEN Collect	LF	preTAS	Ivory Coast	FHI 360	08/24/2020
ESPEN Collect	LF	preTAS	Benin	FHI 360	09/26/2020
ESPEN Collect	LF	TAS 2	Benin	FHI 360	10/12/2020
ESPEN Collect	LF	preTAS	Senegal	FHI 360	09/17/2020
ONA.io	LF	preTAS	Niger	Helen Keller International	01/12/2020
ONA.io	LF	TAS 2	Cameroon	Helen Keller International	10/02/2020

ESPEN Collect and ONA.io Pilot Results

ESPEN COLLECT PILOT

To make EDC services available to an NTDP within a country, ESPEN required a direct request for assistance from the NTDP itself, though in certain cases they accepted a request from an implementing partner staff on behalf of the NTDP. In the cases observed in this study, these requests were preceded by a preliminary conversation between Act | West staff and ESPEN or between all three parties to discuss feasibility, roles, and expectations.

Initial planning for the EDC component of the DSA was led by ESPEN staff based in Brazzaville, Congo. Countries communicated the date and type of survey to ESPEN as well as contact details for primary in-country focal points. The country NTDPs selected the desired services from a list provided by ESPEN Collect and furnished exact districts and clusters targeted for data collection. Before beginning technical assistance, ESPEN required a copy of the survey protocol from the NTDP. In all cases, Act |West staff reviewed and approved the survey protocol, but the ESPEN staff provided a review as well. ESPEN offered standardized questionnaires in relation to all diseases for which DSAs are supported through ESPEN Collect. Countries were offered the opportunity to provide feedback on the standardized ESPEN Collect questionnaires to be used for the DSA in question. ESPEN Collect staff were knowledgeable about the content and flow of DSA questionnaires and were amenable and responsive to country requests for minor changes to the questionnaire. Upon approval of the (potentially modified) questionnaire by the country, ESPEN Collect staff uploaded the XForms (w3.org) to the ESPEN Collect server, hosted by Secure Data Kit (SDK) (securedatakit.org). Finally, the planning conversations covered the need, if any, for additional smartphones and the feasibility of ESPEN Collect procuring a limited number for use in the survey. However, in all three countries in which ESPEN Collect was piloted, the countries procured their own smartphones or used existing inventory.

ESPEN staff prepared a slide deck on use of the EDC devices and questionnaires as part of the in-country DSA training prior to fieldwork. The slides covered the use of the questionnaire in the field, data flow, and the application/questionnaire installation. In the cases where trainers from the NTDP or Act | West (in-country staff) with sufficient familiarity with EDCs were identified, they delivered this training module without the assistance of ESPEN Collect staff. Note that during non-COVID times, ESPEN offers the possibility of in-person in-country trainings; however, since all surveys were conducted during the COVID pandemic, all ESPEN-related assistance was conducted remotely.

ESPEN staff created a survey-specific dashboard via Metabase that displayed data collection progress

FIGURE 1. Example of ESPEN Collect Dashboard Elements

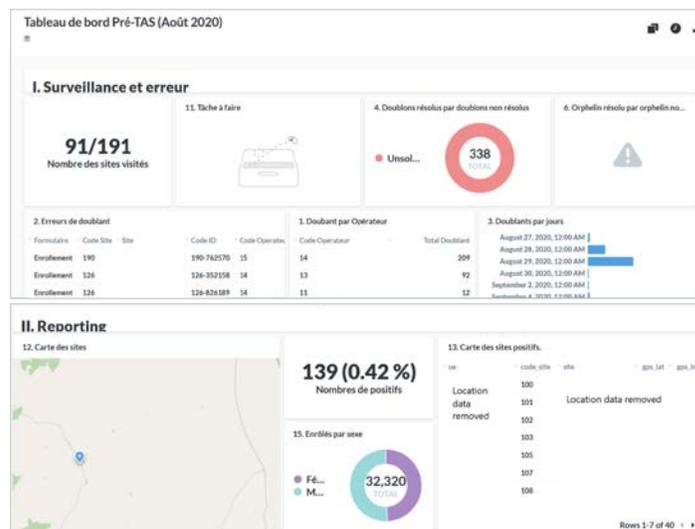
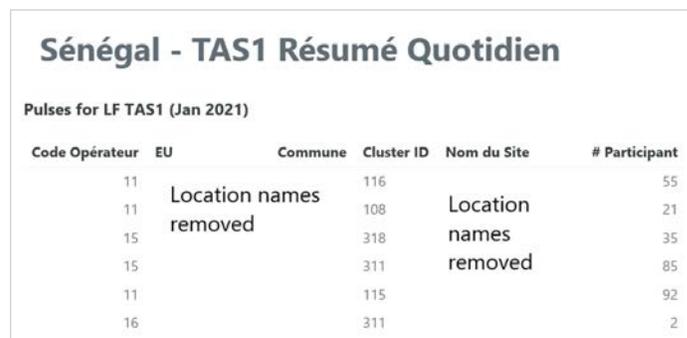


FIGURE 2. Example of ESPEN Collect Pulse Email Update During Data Collection



during fieldwork, including flags for potential data errors. During data collection, ESPEN staff reached out directly to the designated in-country data manager for the survey—typically, but not always, an NTDP staff member—to monitor incoming data and identify any issues. In the case of Benin and Senegal, ESPEN staff reached out to both NTDP and implementing partner staff (i.e., FHI 360, part of Act | West consortium). Corrections were made to a copy of the dataset (stored on the Metabase dashboard site) to preserve the original dataset on the data collection servers for reference.

ESPEN Collect created an automated email to regularly update the NTDP on progress in the field. These emails, the “pulse” feature of the Metabase platform, presented new clusters to be surveyed on

a daily basis. An example pulse email is presented below, with location names removed to respect the confidentiality of the NTDP data.

ESPEN staff encouraged the in-country data managers to create WhatsApp groups with field teams to troubleshoot errors and receive progress updates from the field. While such groups are often used during fieldwork—regardless of EDC platform, their use was not directly observed by Act | West HQ during this pilot. ESPEN staff coordinated the data review and cleaning of basic errors at the end of the survey, and NTDP data managers, or implementing partner staff acting on their behalf, made corrections. Errors were noted in a table that highlighted data quality issues, such as Filariasis Test Strip (FTS) results without a participant ID, participants without final FTS results, and duplicate IDs. Upon completion of data collection, ESPEN Collect typically offered in-country survey organizers the ability to automatically populate the WHO EPIRF. However, submission of the EPIRF by the national NTD program typically only happens after a full year of surveys, and therefore this was not observed as part of the pilot.

OBSERVED LIMITATIONS OF ESPEN COLLECT:

Questionnaire and database versioning issues.

During one country's survey experience, the field team discovered a necessary correction to the electronic questionnaire after data collection had already begun. ESPEN adapted the questionnaire accordingly; however, this caused a second dataset to be generated on the SDK servers. The Metabase dashboard and pulse updates were not updated to display data after the correction was made. When Act | West HQ staff made enquiries of ESPEN with regards to this issue, ESPEN staff answered promptly that it had identified the issue already in consultation with the in-country organizers and had remedied the problem with respect to in-country data management (but not the dashboard or pulse updates). The dashboard remained non-functional for the remainder of the survey activity.

Dashboard creation delay: In a second country, there was a delay between data submission by teams and

its visualization on the Metabase platform. ESPEN staff corrected the issue days after the beginning of the survey, but it did temporarily impact the field teams' supervision during the first days of fieldwork. (It is important to note that the dashboard cannot be designed prior to data collection start date; it is only available after the first data comes in from the field.)

Limited stakeholder engagement. ESPEN intentionally seeks direct engagement with the NTDP, rather than implementing partners (such as Act | West), which is appropriate and reinforces the notion of country ownership. While the implementing partners were engaged throughout initial survey planning and setup steps, later steps involving data corrections, questionnaire changes, basic cleaning and reporting were undertaken with less engagement by implementing partners. Benin was the exception to this, with implementing staff engaging directly with ESPEN staff throughout the process. Note that this is not a limitation of the ESPEN Collect system *per se*; implementing partners are invited to be involved in the EDC exercise at the request of the NTDP, rather than ESPEN, in keeping with the philosophy of local ownership of the activity. However, the lesser engagement in some parts of the process hampered Act | West's ability to observe all aspects of the ESPEN Collect system in action, somewhat limiting observations on pilot results. The dashboard and pulse updates, when functional, served as valuable updates to partners on the quantifiable aspects of field progress (e.g., number of persons tested, percent of sites visited), and in doing so enriched stakeholder engagement, but these functionalities did not inform on the more qualitative status updates (e.g., delays caused by inclement weather).

Restricted Roles and Permissions. In two countries, the designated data manager was the M&E officer from the local Act | West staff. In both cases, the data manager had access to view the dashboard but was unable to edit the underlying dataset during data collection. Given their inability to edit data during fieldwork, data managers were unable to modify the raw data. Rather, the data managers built a running list of corrections detected during field work and applied them to a static, downloaded copy of the dataset in Excel once all fieldwork and uploads had concluded. This became the final dataset used for reporting. Despite not having access to edit

the dataset until the end of data collection, the Act | West staff were able to observe progress via the dashboard and could communicate these to field teams.

TABLE 2 provides a summary of the relative strengths and weaknesses of the ESPEN Collect EDC platform, highlighting services offered by ESPEN staff.

ONA.IO PILOT, WITH SUPPORT FROM ACT | WEST PROJECT STAFF

Two countries, Niger and Cameroon, opted to use a commercial EDC product, ONA.io, for their DSA surveys. The survey questionnaires, the underlying data collection app functions, and the uploading process were effectively the same as those used on the ESPEN Collect platform—not surprising, given the standardized nature of LF survey content, and the common technology and open-source standards⁴ underlying both products.

TABLE 2. Strengths and Challenges of ESPEN collect

	Strengths	Challenges
Introduction of ESPEN Collect	ESPEN team provides a good introduction of ESPEN Collect to the in-country team. They are clearly knowledgeable about their platform.	
	ESPEN is flexible. Initial request submission can be made by the Act West in-country staff, at the request of the NTDP; the submission doesn't need to be made directly by the NTDP.	
Training	ESPEN team shares the materials on ESPEN app and provides the training either in person or remotely.	The critical role of data manager should not be filled by the uninitiated. ESPEN's training for data managers is not intended or sufficient for those without previous hands-on EDC data management experience.
Dashboard	The templates and dashboard are very informative.	Sometimes there are inaccuracies in the dashboard due to dataset (forms) that break the links with the dashboard.
	Errors displayed on dashboard are consistently corrected (e.g., duplicates, orphans, errors in # enrolled per village, errors in GPS, etc.)	Some corrections are done after the fieldwork is complete, and there is no possibility to return to the field for modifications.
Timeline	ESPEN team respects the timeline of the survey (provides timely comments on the protocol, sharing the forms and making the updates on the forms).	The timeline for data cleaning after the survey is variable and is not clearly stated.
Communication	ESPEN Collect team engages with in-country staff frequently. They use WhatsApp to communicate with the field team.	
	ESPEN staff are very attentive and quick to respond.	
	ESPEN staff are always available to respond to the emails (especially their data manager)	
WHO Reports	ESPEN Collect automatically generates PC EPIRF after data cleaning.	

4 <https://getodk.org/> Open Data Kit, accessed April 8, 2021

One key difference between ESPEN Collect and ONA.io is that ONA.io does not include human-based service support. As such, countries who opt to use this platform must rely on service support by knowledgeable implementing partners, such as Act | West.

In Niger and Cameroon, Act | West followed the same steps for preliminary planning with in-country teams as with the ESPEN Collect process. In contrast to ESPEN Collect, Act | West HQ staff did not provide a standard slide deck to introduce EDC during training, but rather relied on in-country staff to lead the training modules using existing expertise with EDC. However, Act | West HQ staff offered support by advising on the data collection process and assisting with the customization of open data kit (ODK) questionnaires in collaboration with in-country staff.

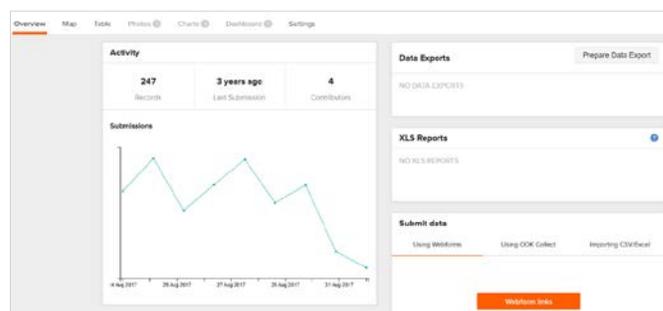
In Cameroon, the NTDP shared data access permissions with local Act | West staff, and both parties monitored the data. During the fieldwork, corrections were made and discussed with the field team members as inconsistencies were identified. For example, one interviewer entered the same village name for two different clusters, which gave the impression that the team had covered fewer clusters than planned; that error was corrected by the data manager. It should be noted that restrictions (i.e., built-in data checks to disallow illogical responses) had been introduced during the development of the form, which helped reduce/cancel data entry errors and inconsistencies. Helen Keller International staff from Cameroon (part of Act | West consortium) also joined a shared WhatsApp group with the NTDP staff to communicate with the field teams during data collection.

As part of the standard for free service packages available to both countries, ONA.io offered a rudimentary “do it yourself” dashboard (with option to upgrade) for stakeholders. However, it was not useful for quickly detecting common data errors such as duplicate IDs, insufficient participants per site, and test results missing participant and site information. This is because the ONA.io dashboard shows the number of responses but does not display key data errors, such as those cited above—a definite limitation to its dashboard.

Such errors were addressed and corrected through manual data manipulation by the in-country data manager. Finally, during fieldwork, ONA.io-sourced data collections did not use automated emails to keep stakeholders informed of data collection progress during fieldwork, as ESPEN Collect did using pulse updates.

Final data cleaning was completed in-country using Excel. It is important to note that, unlike ESPEN Collect, ONA.io does not offer automated population of the WHO EPIRF.

FIGURE 3. Example Dashboard from ONA.io



OBSERVED LIMITATIONS OF ONA.IO WITH ACT | WEST SUPPORT:

Niger use of hybrid EDC/paper model. Niger used EDC as a secondary mechanism to complement paper-based data collection. Teams used paper throughout the survey and translated the paper data to EDC upon return from the field. The electronic questionnaire’s validation (i.e., built-in data checks to disallow illogical responses) was able to flag certain data entry errors during transfer from paper to electronic formats, but it could not alert field teams to change behavior or address and correct data issues in real time. GIS coordinates were the only data recorded electronically in the field. Thus, this approach did not take advantage of the full benefits of EDC such as real-time data validation. This was a decision made by the NTDP and is not an inherent limitation of the ONA.io platform or Act | West support staff. Rather it indicates a lack of full confidence in EDC platforms to replace paper by this NTDP. Such hybrid approaches are not common within the Act | West project for ONA.io-supported EDC surveys outside the pilot period.

Limited access to Niger data. The Niger NTDP created an independent database to collect data, separate from the one used to setup the survey in collaboration with Act | West HQ. The NTDP did not share access to this independent database with Act | West HQ staff, so it was not possible to offer support in data monitoring. Again, this was not a limitation of ONA.io per se, but rather was a limitation sourced by choices made by the Niger NTDP.

Comparison of ESPEN Collect Platform with ONA.io Platform

TABLE 3 displays a summary of the technological and service offerings of the two observed providers.

Conclusions

The technological capabilities of the implementer-administered commercial product ONA.io and that of ESPEN Collect were identical in terms of the core functions of EDC platforms (i.e., data collection, organization, and security). Both systems use the same ODK technology and, as a result, have identical user experiences in the field and during questionnaire design (assuming support services for ONA.io by Act | West staff). Outside of the core functions, however, ESPEN Collect offered a number of human-centered services by ESPEN staff that ONA.io did not—relating to training on the EDC platform, protocol and questionnaire review, customized dashboard generation, live monitoring during fieldwork to track field progress and detect errors, management-oriented email updates during fieldwork, and auto-population of the WHO EPIRF.

TABLE 3. Comparison of technological and service offerings

Platform	ESPEN Collect	ONA.io
Technical support	ESPEN Staff (included as part of the ESPEN Collect platform)	Act West HQ & Local Staff (not included as part of ONA.io platform)
Use of cloud-based data storage	Free	From ONA, free up to 500 submissions/month; USD 99 up to 5,000 submissions/month
Provision of smartphones	Available	Unavailable unless approved by USAID through annual Act West workplan budget
Protocol review	Yes	Yes (by Act West staff)
Dashboard for data quality monitoring	Yes	No
Dashboard for updates on field work progress	Yes	Partial*
Automated emails on field work progress	Yes	No
Standard Slide Presentation for EDC within DSA training	Yes	No
In-person trainer to conduct EDC training	Upon request	Upon request (and provided by Act West staff)
Customizing questionnaire to local requirements	Yes	Yes (by Act West staff)
Assistance in data monitoring and management	Yes	Yes (by Act West staff)
Assistance in reporting	Yes	Yes (by Act West staff)
Auto-population of the EPIRF	Yes	No

* ONA's free and standard packages include rudimentary dashboards showing number of responses but do not display key data errors (e.g., duplicate entries, incorrect cluster sizes, orphan data points) used for data management of NTD DSAs.

Both platforms (ESPEN Collect and ONA.io with Act | West Support) offered a minimum standard of service that facilitated high quality data collection and monitoring. Given the cost (free) and the additional staff services offered by ESPEN, African NTDPs may find ESPEN Collect a better option than ONA.io. Regardless of the platform chosen, however, it should be emphasized that the use of either ESPEN Collect or ONA.io (or any other EDC platform) provides a vast improvement in the ultimate data quality for DSAs over traditional paper-based data collection. The use of EDC platforms, therefore, should always be promoted for DSA data collections.

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