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LIBERIA INFECTION PREVENTION AND CONTROL ACTIVITY

FINAL REPORT

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FINAL REPORT
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This report chronicles the achievements the Infection Prevention and Control Activity in Liberia, a project funded by the Office of Foreign Disaster Assistance (OFDA) and implemented by John Snow, Inc. (JSI). JSI completed its two primary components: 1) training and supportive supervision to health care workers on IPC protocols; and 2) distribution of essential IPC supplies to health facilities all over the country. Via these components, JSI pursued its primary objective of strengthening the culture of infection prevention and control (IPC) protocols within Liberia's health system. The activities associated with these components shifted as the project progressed to reflect Liberia's transition to a post-emergency context, and to address corresponding challenges in maintaining adherence to IPC protocols and availability of IPC supplies.

JSI's geographic scope on the IPC Activity is vast. The training and supervision (TS) component covers all functional facilities in the counties of Bomi, Cape Mount, Gbarpolu, Grand Kru, Rivercess, Rivergee, and Sinoe, as well as 26 private facilities in Montserrado. The supply distribution component covers nearly all public and private facilities across all 15 counties of Liberia. The IPC infrastructure improvements reach 45 priority facilities across the aforementioned TS-focus counties. Major accomplishments over the course of the project include the following:

- JSI trained 1,609 health care workers on the Keep Safe, Keep Serving (KSKS) training curriculum, and 2,091 on the Safe and Quality Service (SQS) training¹
- JSI conducted 1,076 supportive supervision facility visits to reinforce KSKS key messages
- JSI conducted seven rounds of nation-wide IPC supply distribution, serving over 95 percent of health facilities in Liberia
- JSI provided IPC infrastructure improvements in 45 health facilities across seven counties (43 incinerators, 20 water tank installations, and 13 triage and holding units).

This final report begins with a profile of the IPC Activity's (IPCA) role in the Ebola virus disease (EVD) response, followed by a chronological summary of the corresponding evolution of project activities. This is followed by more detailed analysis of the achievements and challenges encountered under each component, as well as a look ahead at the challenges inherent in protecting the strides made by this project in building MOH and county health team (CHT) capacity to institutionalize IPC measures in the health system.

IPCA ROLE IN EBOLA RESPONSE

The impetus for JSI's scope of work on the IPC Activity stemmed from the height of the crisis of EVD in Liberia. At the time the project was awarded by OFDA in November 2014, 157 health care workers across Liberia had died of EVD, and the delivery of routine health services remained severely disrupted.² As the project got underway, JSI assumed the critical role of coordinating response efforts of partners through the IPC task force, including reporting to the Ministry of Health on the facility-based KSKS trainings achieved by all IPC partners. Cumulatively, as of the last day of December, 20,148,018 cases and 3,423 deaths had been reported nationwide.³

When the IPCA team scaled up the two major project components in January 2015, it did so with cautious optimism, as the number of suspected and confirmed cases in Liberia had markedly declined in December. As of January 2015, there were active cases in only five—Bong, Cape Mount, Margibi, Montserrado, and Sinoe—of the 15 counties. The other 10 counties had observed at least 21 days without an active case. In Montserrado, there was a modest resurgence in early 2015 and health care workers were among those infected. JSI's still-evolving IPC supportive supervision strategy was refined to meet emerging needs. JSI master trainers focused on reinforcement of practical triage procedures, and committed to intensive supervision rounds consisting of 3-5 consecutive days per round. Following the rounds, trainers assessed facility knowledge, practices, available stock on hand, and overall readiness to deliver independent care. As part of the same emergency response, in February JSI coordinated rapid IPC supply quantification and within a few days had distributed supplies to 66 priority Montserrado facilities.

Between February and June, there was only a single confirmed EVD case recorded in Liberia, leading to the much celebrated 'Ebola Free' distinction from the WHO on May 9th, 2015, the day the country completed 42 consecutive days without a case. However, there have since been two notable resurgences, in July and November. JSI has played a major role in responding to each cluster of new cases, and has been instrumental in limiting their impact:

Nedowein Cluster (Margibi and Montserrado). The IPC Activity was among the first responders that mobilized to contain the cluster centered in Nedowein District in Margibi. JSI's master trainers participated in IPC assessments of health facilities near confirmed cases as part of a 'ring strategy' coordinated by the IPC task force. JSI also distributed emergency IPC supplies to all high-risk facilities in the area. When a case originating in the cluster traveled into the densely

¹The SQS training reached some of the same beneficiaries trained under KSKS. The total number of individual training beneficiaries for the project is 2,819.

²WHO Ebola Sitrep, November 5, 2014.

³WHO Ebola Sitrep, December 31, 2014.

settled Paynesville section of Monrovia, JSI again participated in an intensive IPC audit of more than 70 health facilities that might have been accessed by high-risk contacts and conducted follow-up actions with Montserrado partner facilities. The cluster was contained at seven cases, and Liberia was once again declared EVD free on September 3rd.

Duport Rd. Cluster (Montserrado). When three new cases were recorded in Montserrado in November, the IPC task force immediately developed a 'ring' response that created a 3-kilometer radius around Duport Road Health Center and JFK Medical Center, where the confirmed cases had sought care. Within the first three days of the emergency, JSI had delivered IPC supplies to all 66 facilities in the ring response. In addition, JSI master trainers conducted daily mentoring and supervision at seven of the high-risk facilities within the ring during the first two weeks of the response. JSI also participated in focus group discussions with health care workers involved in the response to explore ongoing IPC protocol adherence lapses. The cluster was contained at three cases.

The success of the responses to each cluster required a high level of coordination among international NGOs and the Liberian Ministry of Health (MOH), as well as a considerable investment of resources. As many of the emergency response funding mechanisms come to a close, the MOH's ability to maintain a modicum of health care worker adherence to IPC protocols and ensure availability of IPC supplies in facilities in the months ahead will likely be tested by re-emergent EVD clusters.

SUMMARY OF ACHIEVEMENTS, BY QUARTER

NOVEMBER – DECEMBER 2014:

- Conducted partner mapping
- Recruited key staff
- Completed transition of IPC coordination ownership from RBHS project

The IPCA Cooperative Agreement went into effect in November 2014. At this time, JSI was already heavily involved in the EVD response as the lead implementer of the USAID-Rebuilding Basic Health Services project (RBHS). As an emergency measure, the RBHS scope had shifted to facilitate the development and rollout of infection, prevention, and control-focused training curriculum for health care workers.

Many of JSI's key contributors on RBHS transitioned to the IPC Activity. As the new project was taking shape, JSI retained a key coordination role among IPC stakeholders. JSI conducted a partner mapping exercise in IPCA's first month to finalize its geographic

scope and avoid duplication. In coordination with stakeholders, JSI's IPCA mandate was solidified by the close of 2014. Concurrently JSI completed recruitment of the core IPCA team including county-based logisticians, monitoring and evaluation specialists, and training-supervision specialists.

JANUARY – MARCH 2015:

- Trained a total of 1,097 health care workers from 97 health facilities across six counties
- Conducted 1st and 2nd round distributions (442 and 455 facilities reached)

Foundational workshops: In January, the project management team held a workshop health officers and health development directors from each county. The workshop introduced the project's scope and objectives, informed participants of upcoming activities in each county, and solicited suggestions on ways to strengthen IPC practices and ensure availability of supplies across the country. By then, the CHTs were familiar with the KSKS package of IPC materials that had been accepted by the MOH for use in all public and private health facilities in the country. In January, JSI organized a formative training session for newly hired logistics specialists and county pharmacists and depot managers to prepare for the first round of IPC supply distribution and familiarize participants with the data collection processes.

Coordinated the rollout out KSKS training and supervision: By the start of 2015, many health care workers (HCWs) across JSI's designated TS-focus counties had received at least an initial round of training on the KSKS curriculum from other partners.⁴ Coordinating efforts with other implementing partners was a task of paramount importance from the start to ensure efforts were complemented rather than duplicated. In counties where KSKS had already been implemented, JSI's follow-up training was preceded by a round of IPC supportive supervision to assess the degree of knowledge of and adherence to the main recommended IPC practices. In all counties, this exercise revealed knowledge gaps, including HCWs who had not been trained at all, and consistently low compliance with the most critical practices, which prompted JSI to swiftly develop a comprehensive refresher training schedule. All training activities included practical demonstrations and distribution of educational material for HCWs, including posters, job aids, standard operating procedures, and a copy of the IPC reference manual used during the training sessions. JSI also established its model of monthly supportive supervision across all eight TS-focus counties, enabling the team to identify trends and allocate

⁴Grand Kru, Rivergee, and Gbarpolu HCWs were trained by other projects, including JSI's RBHS, in late 2014. Rivercess, Bomi, and Cape Mount were initially trained by a combination of IPCA and other partners including Medical Teams International and Last Mile Health. In Sinoe, JSI provided the first round of KSKS training. In Montserrado, JSI covered its own mandate of 26 facilities and provided assistance to MTI by conducting training in 49 additional facilities under their mandate.

resources to poorer performing counties and facilities for appropriate corrective actions.

Launching IPC supply distribution: Following initial training and deployment to the counties, JSI logisticians conducted inventories of

APRIL - JUNE 2015:

- Trained 512 health care workers from 40 health facilities across six counties
- Conducted supervision at 49 facilities in April, 176 facilities in May, and 159 facilities in June
- Conducted 3rd and 4th round distributions (690 and 684 facilities reached)

existing IPC supplies at each county depot and worked with county pharmacists to prepare for the first round of distribution, selecting distribution teams, identifying routes, and assessing vehicle availability. JSI depended on the World Food Programme (WFP) to transport IPC supplies to the counties and provide storage units for them. JSI coordinated with WFP to mitigate the effects of delays in that crucial component, and began the first facility distribution in early February.

In the second quarter of 2015, IPCA expanded the reach of the distribution component nationwide, and completed KSKS training for the remaining HCWs in the eight TS focus counties who had not been reached. The IPC infrastructure component of the project began in earnest, with sites and contractors selected for 10 incinerators. This rapid expansion of project activities was achieved in an increasingly challenging physical environment, as the onset of rainy season in May hindered transportation in many parts of the country. The quarter

closed with notification from OFDA that the IPCA extension was approved for an additional six months, through the end of 2015.

Over the course of the quarter, JSI's master trainers transitioned from training provision to supportive supervision provision, committing to a goal of a minimum of one visit a month to each facility within the TS focus counties. At first the supervision visits were limited to one day per facility, but JSI soon expanded the approach to include multi-day intensive visits to allow more comprehensive follow-up coaching to fill IPC gaps. JSI adapted the tools used in supervision to reflect changing needs, in particular making improvements to the MOH-designed Facility Audit Tool. JSI also expanded its mentorship of CHT-assigned IPC focal persons, holding workshops to focus their efforts in Bomi, Sinoe, and Cape Mount over the course of the quarter.

On the supply distribution side, JSI's reach increased considerably over the quarter, with the addition of nearly all Montserrado private and public facilities to the distribution schedule, as well as the addition of all public hospitals nationwide. Though JSI logisticians continued to collect data on consumption of IPC supplies from all facilities, the quality of the data compiled by facility staff was questionable. JSI thus developed the routine data collection tool (RDCT) to improve the data quality. JSI logisticians first used the RDCT to collect data from a sample of representative facilities during the June distribution.

JULY - SEPTEMBER 2015:

- Conducted supervision at 188 facilities in July, 207 in August and 35 in September
- Conducted 5th round distribution (675 facilities reached)

A clinic in Cape Mount county that received supplies, training and supervision from JSI.



With the onset of the IPCA extension period July 1, additional activities were added to the scope of work. The IPCA scope evolved to reflect Liberia's transition to a post-emergency context, and to mitigate corresponding challenges to IPC protocol adherence. During the extension period, JSI's efforts to institutionalize IPC measures became increasingly focused on building ownership at central, county, and facility levels. Key shifts in programming included:

- training and supervision component transitioned from its basis on the KSKS training curriculum to the new SQS training curriculum, as required by the Ministry of Health
- JSI's support for IPC and WASH infrastructure components at priority health facilities was greatly expanded beyond incinerators to include water tank installations and temporary triage and holding units
- JSI introduced a performance-based incentive program, rewarding health facilities that sustained improvements on key IPC indicators with packages of expendable supplies and tools for making small-scale facility improvements.

Over the course of the quarter, the supervision component reached its high-water mark of 207 facilities in August, then scaled down rapidly to make way for the SQS training implementation. By the end of September, JSI training staff had completed training-of-trainer workshops in seven counties, held an SQS data-entry orientation workshop with all M&E staff, and had formed partnerships with five other implementing organizations to implement SQS in the counties where KSKS training had taken place.⁵ Also in September, JSI compiled the results from its performance-based incentive program in training and supervision focus counties, and made preparations to reward 55 facilities accordingly.

The distribution component continued, completing the fifth round of distribution in August. As a signal that a post-emergency phase had been reached, JSI and other supply chain stakeholders revised the IPC packing list to reduce the amount of bulky enhanced PPE going to facilities, as it was no longer being used regularly. Also, when the second round of consumption data was collected in August through use of the RDCT, JSI prepared a presentation on average monthly consumption for supply chain stakeholders.

With the first phase infrastructure (10 incinerators) nearing completion, JSI hired contractors to begin work on the second phase in August. Eight contractors were hired to build 33 incinerators, 13 triage and holding units, and 20 water tank installations across seven counties. By the end of the quarter, work was underway at in county.

OCTOBER - DECEMBER 2015:

- Contributed to SQS training in eight counties and directly trained 2,091 non-clinical HCWs in five counties
- Conducted 6th and 7th distribution rounds (693 and 724 facilities reached)

JSI's role in implementing the non-clinical stream of the SQS training package picked up in early October. The non-clinical stream was a natural fit for IPCA trainers as it largely focused on the same IPC principles as KSKS, with an additional component covering psychosocial support. JSI exceeded its SQS training target of 1,754 non-clinicians across five counties.

During this final quarter of IPC supply distribution, JSI's focus was on not only ensuring that stock on hand at all targeted facilities was fully replenished in a timely manner, but also that CHT partners were left at the end of the project with an accurate picture of the stock on hand at both facility and county (mobile storage unit) levels. At 95 percent of all functional facilities served, the final round of distribution was the project's highest total ever. JSI continued to collect consumption data, and had three months of average monthly consumption data to report by the end of the quarter. In December, the JSI-managed USAID | DELIVER PROJECT hosted a workshop for IPC supply chain stakeholders on the quantification of IPC supplies going forward, incorporating the consumption data generated by IPCA. At the workshop, the IPCA consumption data was reviewed, adjusted for compliance rates and analyzed to identify trends for future supply forecasting needs over the coming 18 months.

By the end of 2015, nearly all technical activities were completed and county-based staff recalled. JSI was granted an administrative extension by OFDA to complete project closeout in January and February 2016. During this period, IPCA management verified the completion of all infrastructure improvements, ensured that project resources were disseminated to stakeholders, and completed reporting requirements.

STRATEGY ELEMENT I - IMPROVING IPC PRACTICES THROUGH TRAINING AT HEALTH FACILITIES

IPC training and supervision activities have been implemented by a team of 15 roving master trainers and seven county-based training and supervision specialists. They were supported by a regional-focused TS specialist and received managerial and technical oversight from a Monrovia-based training and supervision advisor. Master trainers' tasks included conducting initial and follow-up training and supervision visits, mentoring health workers, collecting monitoring data, and documenting activities. The county-based TS specialists were responsible for coordinating master trainer activities in the counties, liaising with the CHTs, building their capacity, and ensuring that IPC structures were in place and functioning in facilities and within the CHT.

The Keep Safe, Keep Serving package of IPC materials was reviewed and accepted by the MOH in 2014 in the context of the emergency EVD response for use in all public and private health facilities nationwide. The base components of KSKS included: 1) training curricula for each level of the health system and clinical and facility support staff; 2) personal protective equipment (PPE) and water and sanitation minimum requirements at each facility and; 3) follow-up supportive supervision with an emphasis on ensuring that basic health

⁵JSI partnered on SQS with International Organization for Migration in Bomi, Gbarpolu, and Cape Mount, Partners in Health in Grand Kru and Rivercess, American Refugee Committee in Rivergee, and Medical Teams International in Sinoe.



Women and young children wait to receive care at a clinic in Cape Mount county after being screened for Ebola

service provision would be restored and delivered safely. As IPCA's training component got underway, KSKS was already established and being implemented by several partners. JSI received its assigned TS focus counties of Bomi, Gbarpolu, Cape Mount, Grand Kru, Rivercess, Rivergee, and Sinoe with the understanding that another OFDA-funded project implemented by Jhpiego would cover other counties. Responsibility for the nearly 300 facilities in Montserrado was divided across many organizations through coordination of the Montserrado IPC committee. JSI took on 26 Montserrado private facilities that didn't have support.

JSI adapted the MOH-designed facility audit tool to make the sustained supportive supervision more relevant and up-to-date on gaps and emerging needs. The updated version helped standardize findings during supervision visits and allowed comparisons across facilities and counties. JSI training and supervision staff worked with CHTs to analyze and discuss county-specific results and action items.

As JSI trainers transitioned from training to follow-up supervision, they set a goal of monthly facility visits. At the end of each round of supervision, team members used the revised Keep Safe, Keep Serving audit tool and the minimum standards tool to assess facility knowledge, practices, and overall readiness to deliver care. Given the widespread lack of sturdy waste management solutions available at facilities, the mentorship was practically focused on maximizing the use of available resources. The audit tool helps to standardize the supervision visits, and is easily shared with other partners. It also gives facility staff tangible follow-up tasks.

JSI created the basis for sustainability of IPC activities by facilitating discussions with facility-level IPC focal persons (IPC-FPs) to share

lessons and find ways to improve health care workers' IPC practices. These forums also helped IPC-FPs understand their IPC practices roles and functions at the facilities and devise mechanisms to improve compliance. JSI also established CHT-assigned FPs and steering committees to extend the emphasis on IPC-FPs to county level.

The Performance-based Incentive (PBI) program provided a complementary reinforcement of the supervision principles. It was designed to motivate participating health care workers, improve service delivery, and increase demand. Facilities across the TS focus counties were assessed using key IPC indicators including PPE utilization, environmental cleaning, disinfection, and waste management. Prior to rollout, the PBI program structure and indicators were shared with facility administrators and county health officers. The top-performing facilities were given a choice of supply packages: expendable items (e.g., bedding, soap, torches, batteries, fans, mattresses), or facility improvement items (e.g., zinc sheets and hardware, paint, filing cabinets, grass cutters). Two months after the introduction of the incentives, 56 facilities qualified and received their packages. Due to the transition from KSKS to SQS and corresponding changes in IPC best practices, the program was not continued in the final quarter.

The SQS training package was developed under the leadership of WHO and MOH to replace the KSKS training package. When the package was completed, donors, implementing partners, and other stakeholders had intense discussions about how it would be rolled out and funded. The WHO developed an operational plan that consisted of 'lead' SQS implementing organizations in each county in partnership with CHTs. The training was designed with two streams: four days of offsite training for clinical HCWs, and two days for non-clinical HCWs.

²The CHT led the site-selection process, identifying health facilities with high patient intake and insufficient IPC infrastructure.

By September 2015, the MOH had approved SQS, and by the end of that month, JSI had phased out its KSKS-based supervision. JSI determined that instead of acting as a lead organization in any one county, it would be a substantial supporting organization for the eight TS focus counties and train the non-clinical, non-hospital health care workers. The non-clinical stream is a natural fit for IPCA trainers because it is focused on many of the same IPC principles as KSKS, with an additional component covering psychosocial support. Across the eight counties, JSI engaged in partnerships with five different implementing partners. The nature of each partnership depended on the resources available to each implementing partner.⁶

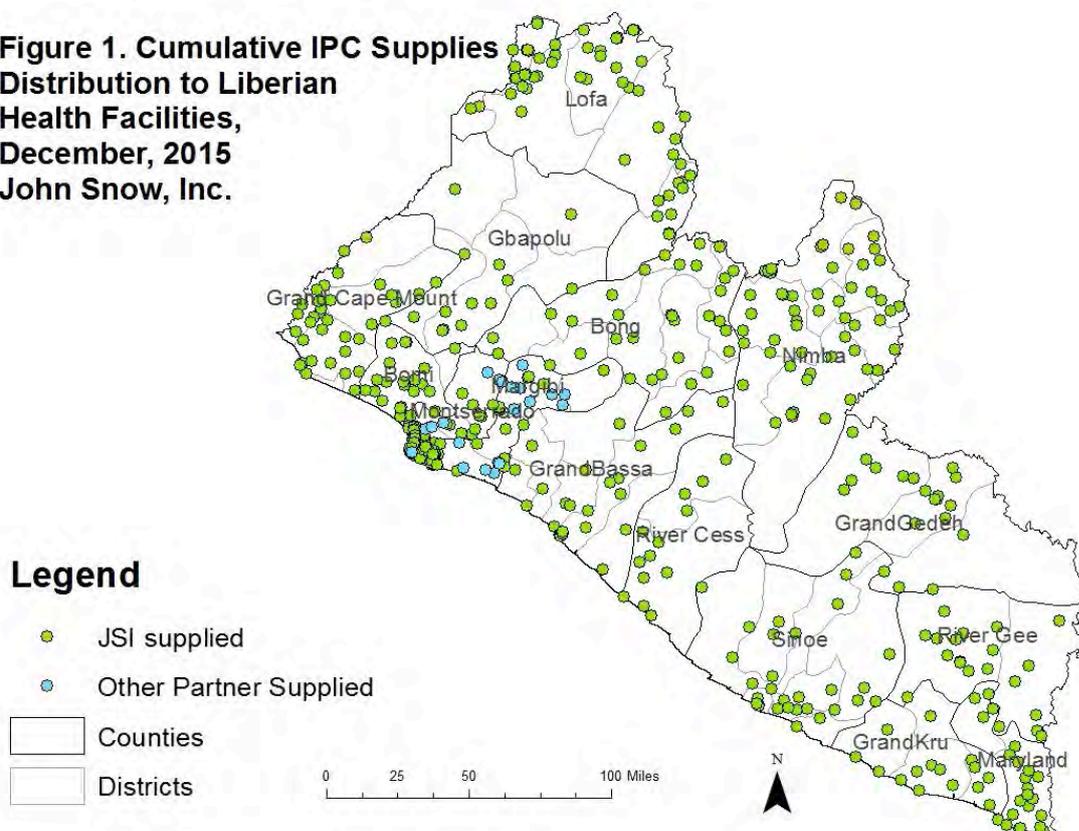
Across JSI's SQS focus counties, JSI master trainers tailored the training content to the education level of their audience, translated material into Liberian English and other dialects as needed, and adjusted for low-literacy and low-numeracy participants. The SQS curriculum itself is not ideally suited for a non-clinical audience. Many cleaners, registrars, and other non-clinical health workers had low baseline knowledge on best practices for disinfection, waste management, and hand hygiene prior to the intervention by SQS. One of JSI's major recommendations to the SQS implementing community was that training

content be pre-tested on HCWs who have low literacy and numeracy skills before being finalized, especially because JSI trainers spent so much time making the content practical and relevant for users.

STRATEGY ELEMENT II: IPC SUPPLY DISTRIBUTION

The foundation for JSI's supply distribution component was set in late 2014, as stakeholders including JSI, the WHO, and MOH developed a standard packing list and quantification of IPC supplies for clinics, health centers, and hospitals. In the emergency context at the time and absent consumption data, the distribution strategy was set as a push system to ensure all facilities were well supplied. In each county, JSI committed a logistician to lead distribution to provide enough support to complete last-mile distribution in all 15 counties of Liberia. Over the course of leading seven rounds of distribution, each logistician took inventory of IPC supplies at the county and facility levels before and after each distribution, facilitating the allocation and movement of distribution teams, and generally allocating resources necessary to reach even the most rural facilities. The logisticians were

Figure 1. Cumulative IPC Supplies Distribution to Liberian Health Facilities, December, 2015
John Snow, Inc.



⁶In Bomi, Gbarpolu, and Cape Mt., IOM paid for all SQS training and led sessions in which JSI participated. JSI did not claim the SQS trainees in these three counties in its reporting figures.

supported by a supply chain technical advisor based in Monrovia and a roving senior logistics specialist. The Montserrado-based logistician was supported by additional staff at the central warehouse. All field-based logisticians worked closely with CHT pharmacists, county depot staff, drivers, and other Government of Liberia employees.

The importance of coordination with other supply chain stakeholders was paramount, as the responsibility for procurement and distribution to county level fell to the World Food Programme (WFP), and WHO logisticians also provided substantial technical oversight. The WFP set up two types of de-centralized storage facilities – regional level forward logistics bases (FLBs) in Grand Gedeh, Maryland, Bong, Grand Bassa, and Lofa, and county-level mobile storage units (tents) in Sinoe, Grand Kru, Rivergee, Nimba, Rivercess, Margibi, Gbarpolu, Bomu, and Cape Mount. Monsterrado’s considerable supply needs were met by the central warehouse at the SKD logistics hub. JSI also maintained its own storage space at SKD to perform ‘kitting’ – preparing bundles of IPC supplies for each facility. JSI focused on ‘last mile’ distribution – defined as transport of supplies from county-level facilities to the health facilities.

For each round of distribution, JSI corresponded closely with WFP to convey the proposed schedule for last mile distribution, to ensure the availability of supplies at the various FLBs and MSUs. This was a challenge in the early-going, as WFP experienced costly delays in getting the MSUs and FLBs online and fully stocked. Coordination with other implementing partners was also crucial, as some partners maintained ad-hoc distribution schedules with facilities they supported. In particular JSI liaised with Save the Children – who continued to supply 15 facilities in Montserrado and all MOH facilities in Margibi County throughout 2015.

Whenever possible, and upon request from CHTs, JSI took advantage of its broad logistical reach to equip other important outposts with

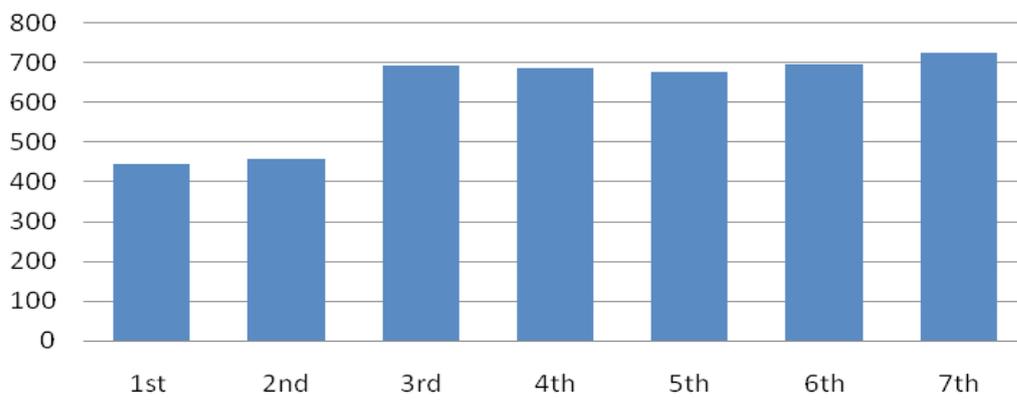
IPC supplies and even other essential commodities. For example, JSI logisticians actively participated in distribution of IPC material to schools in Grand Kru County, paracetamol to facilities in Montserrado County, IPC supplies to border posts in Bong, Cape Mount, and Grand Gedeh counties, and IPC kits for households in Lofa County. JSI also pre-positioned polio vaccines on behalf of CHTs during the national immunization drive in November.

Figure 2 shows the progressive increase in JSI’s distribution reach across each round. Each county had its own set of logistical challenges, but JSI logisticians employed a variety of creative and locally sourced solutions to ensure that even the hardest to reach facilities were served. Where the roads were impassable for trucks, motorcyclists were hired to pile supplies on the backs of their bikes. When the roads became impassable even for motorcycles, ‘human conveyers’ were hired to carry supplies on foot. When rain-swollen rivers made roads completely impassable, even on foot, supplies were sealed in waterproof bags and sent across on canoes. As the road network further deteriorated with the rainy season onset, several of the least accessible facilities received multiple-month quantities of supplies in one visit. With JSI guidance, many facilities found creative ways to designate additional storage space for IPC commodities, both onsite and in space donated by community leaders.

Each round provided a significant learning experience and a multitude of suggestions to continuously improve the efficiency and cost-effectiveness of the process. In September, after five rounds of distribution, JSI convened all 15 county-based logisticians in Monrovia for a review workshop to consolidate lessons to date and develop an improved workplan for the remainder of the project. A number of strategies were employed from that point onward, the most significant being the deployment of JSI administrative staff across the country to provide additional financial oversight and support to logisticians. Round by

FIGURE 2: PROGRESSION OF FACILITIES SERVED, 7 ROUNDS OF DISTRIBUTION

Health Facilities served by Distribution Round, 2015



round, JSI's teams became more adept at minimizing the use of expensive rental cars and limiting the number of days needed to complete distribution in each county, greatly improving cost efficiency.

Throughout the project, JSI logisticians maintained their commitment to using the MOH-standard logistics management information system tool—stock balance reporting and requisition (SBRR) forms—from all health facilities. However, because the quality of data generated from the SBRR was questionable, it was difficult to make reliable assumptions on IPC supply consumption rates at different tiers of health facilities. In consideration of the urgent need for reliable IPC consumption data, JSI developed an alternate means of data collection, the rapid data collection tool (RDCT), in May and June. The simple form was filled by JSI logisticians at the point of distribution. Consumption was calculated based on physical stock on hand, quantity received that day from JSI, and any days of stock out. The RDCT was used to assess consumption rates for the most critical disposable IPC commodities, not the full packing list. The RDCT was employed in the final four rounds of distribution at a sample of 70 health facilities, including facilities in all 15 counties and representation from each tier of the health system (hospital, health center, and clinic). By project end, JSI had collected three months of data to inform assumptions about average monthly consumption rates.

In addition to consumption rates, JSI logisticians capitalized on their relatively frequent access to health facilities to collect key logistical datasets. By the end of 2015, JSI had collected data on the distance of each facility from the county depot and the amount of available storage space at each facility (in cubic meters). The logistical datasets will help CHT planning efforts and have been shared with the USAID | DELIVER PROJECT to facilitate data modeling for national efforts to roll out the Supply Chain Master Plan.

Even tools as simple as the health facility lists that JSI compiled and maintained over the course of the year has filled large gaps for CHTs and implementing partners alike. This was especially the case in Montserrado, where the multitude of private facilities frequently close, re-open, change names, and/or change locations. The Montserrado facility list will continue to aid implementation for Montserrado CHT and its partners.

JSI M&E specialists and lead partners performed SQS data entry and management.

STRATEGY ELEMENT III: BUILDING MOH IPC OVERSIGHT CAPACITY

As JSI's county-based teams were embedded within the CHT structures, all day-to-day activities inherently contained a strong element of knowledge transfer and capacity building. CHT members were active participants in IPC supportive supervision visits and supply distribution. They also participated in workshops that were designed to: 1) build capacity at facility and county levels within the context of IPC; and 2) to strengthen the network of IPC-FP in JSI-supported counties.

Additionally, IPCA staff helped CHTs identify IPC-FP at CHT level and form county level IPC steering committees, which met regularly to discuss and monitor timely IPC issues and develop informed responses. At the central policy level, IPCA contributed to the codification of IPC protocols within the Liberian health system through its influential role on the IPC task force and steering committee.

Throughout the implementation timeline, IPCA remained an instrumental member of the National IPC Task Force chaired by the MOH with technical support from WHO as a forum for implementing partners to share experience, develop guidelines, and coordinate efforts. It also has provided a crucial incident command framework for IPC response efforts when clusters of EVD cases have re-emerged. JSI helped the task force produce the resources for supportive supervision of facilities, including the aforementioned minimum standards and the facility audit tools. At a higher level, JSI was an active member of the IPC steering committee, chaired by MOH and comprising membership of a few key institutions. JSI contributed heavily to the National IPC Policy, a working document that codifies many of the practices that JSI had already been reinforcing by strengthening county and facility-level IPC committees. The policy calls for sustained support for IPC committees at both levels to bolster IPCA's efforts to establish and nurture their development.

Next steps for training and supervision: The switch from the KSKS to the SQS package is an important step in the transition from emergency-focused IPC programming to a more general and routine focus on HCW capacity building. Though IPC is still a major focus of the SQS package, protocols are in the context of routine service delivery. Clinical and non-clinical HCWs are encouraged to adapt previously learned emergency IPC measures to their current day-to-day work through concepts like risk-based PPE usage. Health care workers trained by JSI on the SQS package have emerged with a more sustainable mentality for maintaining their safety over the long term through the adoption of risk-based PPE-usage. Along with other implementers, JSI strongly emphasized the importance of refresher training, supervision, and mentorship to capitalize on knowledge gained through SQS. As of the end of 2015, the Ministry of Health with the support of implementing partners is leading the development of a follow-up mentorship framework and package. The planned framework will center on clinical and quality improvement standards. The package will be structured so that mentorship activities will be driven by health facility staff and county health teams to promote sustainability and will result in tailored capacity building and health system strengthening activities.

Next steps for supply distribution: At the national level, JSI has coordinated closely with an EVD commodity transition group of key supply chain stakeholders including the MOH Supply Chain Management Unit (SCMU). The working group has compartmentalized functional areas containing key actions for integrating IPC supplies into the national supply chain. In October 2015, the group revised the IPC supply packing list, to reflect facilities' feedback on slowed consumption of bulky enhanced PPE. In particular, IPCA coordinated

closely with the USAID | DELIVER PROJECT, which is working with the SCMU to build IPC supplies quantification, forecasting, and procurement capacity and SCMU and NDS ability to incorporate a select set of IPC commodities into the routine public health supply chain. The consumption data collected through IPCA are crucial to efforts to produce a national forecast and supply plan for routine use of IPC commodities going forward, as well as the calculations for projecting commodities needed for contingency stock in the event of future EVD cases. The consumption data has provided a foundation for determining ideal minimum and maximum stock levels for IPC commodities at facility level, and the MOH will use the information to solicit additional funding to procure needed supplies in the coming months.

At the county level, JSI increasingly integrated CHTs into both warehouse management and facility-level distribution over the latter half of 2015. The final distribution of supplies in December was led by each county pharmacist with mentorship from JSI's county-based logisticians. At the outset of the final round, JSI gave county pharmacists guidelines for managing county mobile storage units (MSUs), which hold each county's ICP supply stock. JSI logisticians held official handover ceremonies at each MSU and distributed hard copies of IPC supply waybills, SBRR, and electronic stock on hand reports.

As another capacity-building element to final distribution, the process combined physical inventory and data collection at each facility. The inventory data is intended to ensure that CHTs and especially the pharmacists know their stock on hand status at the point of management transfer from JSI, and are able to plan accordingly. Whenever possible, the CHT/JSI distribution teams supplied facilities with the full IPC packing list in the final round. JSI logisticians helped facility officers in charge (OICs) develop and utilize supplemental storage space, and OICs were encouraged to accept the full package to prevent stock outs.

Scale-down presentations to CHTs: Over the course of the final quarter, each JSI field-based staff member made a comprehensive transition presentation to his/her CHT partners to help them absorb and expand JSI activities. Although the presentations were specific to the context of each county, many key recommendations were consistent for all CHTs. On October 22, JSI's central office hosted an event in Montserrado County that was attended by members of Montserrado CHT including the CHO and some key central MOH figures. Each county presentation followed a standardized format to showcase not only achievements but specific methods/strategies and tools, challenges, and recommendations, with a focus on making resources transferable to CHTs.

IPC INFRASTRUCTURE IMPROVEMENTS

The IPC infrastructure component grew significantly over the course of the project. JSI employed a full-time consultant as a roving infrastructure supervisor, and as the workload increased, added two roving site monitors.

JSI's infrastructure focus consisted of three components all related to improving IPC practices at the facility level: triage and holding units, water tanks, and incinerators. The geographic scope was the same focus counties included in the training and supervision component.⁷ Within those counties, the CHT led a prioritization and ranking exercise, providing JSI with lists of the highest-need facilities as well as qualitative feedback. JSI's infrastructure supervisor conducted extensive site assessments between July and August 2015 to verify site placements, conduct environmental impact analysis, and finalize the lists. After an extensive competitive bidding process in August, JSI hired eight vendors to work across the seven counties. Some sites were revised in September to avoid duplication of other donor-funded infrastructure project efforts.

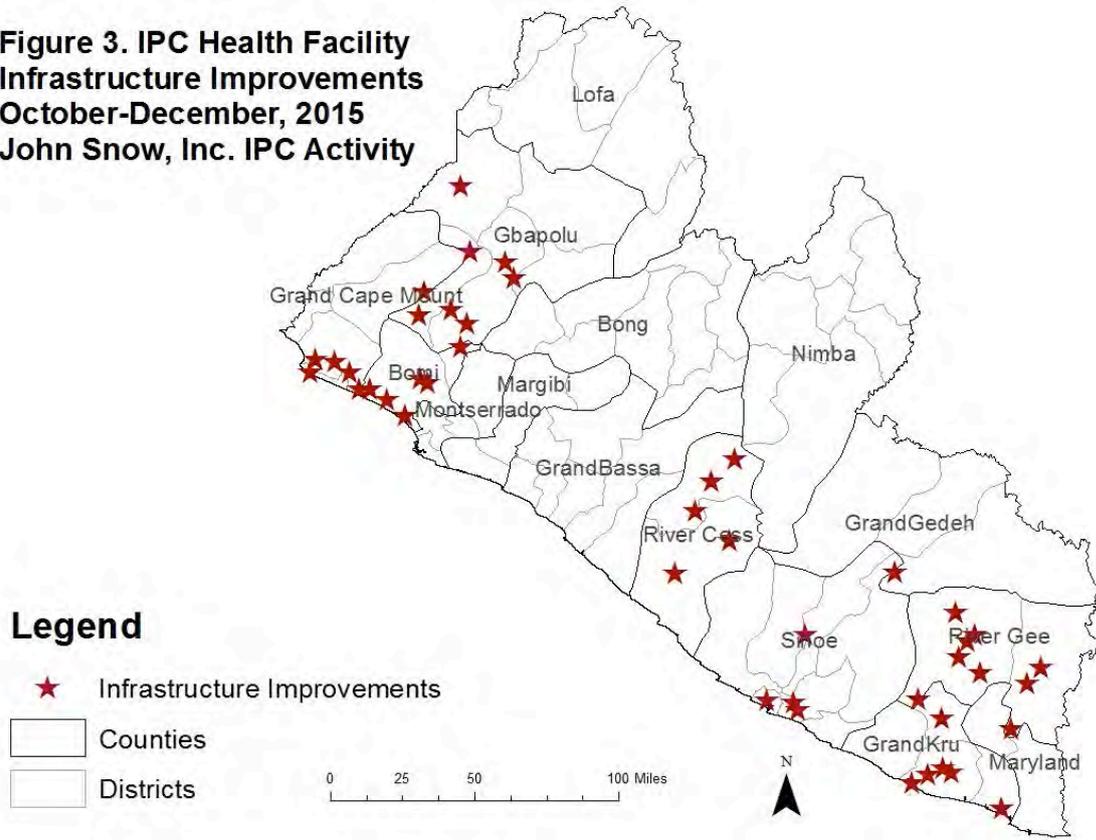
Triage and holding units: JSI-hired vendors installed 13 temporary triage and holding units in six counties. JSI adopted a basic design developed by a sub-working group of the IPC task force and adapted the bill of quantities. The design enforces a uni-directional flow of foot traffic, and meets minimum IPC standards by providing a safe temporary holding place for suspect cases while they await referral to a higher level facility. The CHTs prioritized high-volume clinics and health centers to receive the temporary triage and holding units for JSI.

Water tanks: JSI delivered 1,500-gallon water tanks to 20 health facilities. The vendors installed them on a concrete foundation with roof rainwater catchment systems. Prior to JSI's intervention, the chosen facilities had no prior water source for facility use, and so could not model best WASH practices.

Incinerators: JSI-hired vendors installed ash pits and 43 Montford medical waste incinerators. Each incinerator is housed in a fenced and covered enclosure for enhanced security and protection from weather. Many of the facilities had incinerators on site already, but they did not function and had to be replaced. Through a combination of JSI staff and the hired vendors, staff at all recipient facilities have been trained on incinerator standard operating procedures.

In Montserrado, space restrictions prevented the installation of incinerators, so JSI provided 21 portable waste burners to partner facilities.

**Figure 3. IPC Health Facility Infrastructure Improvements October-December, 2015
John Snow, Inc. IPC Activity**



One of 43 incinerators provided by JSI.



TABLE I: INFRASTRUCTURE SITES BY COUNTY AND TYPE

Bomi County	Incinerator	Triage Unit	Water Tank
Dagweh Clinic	✓		
Bonjeh Clinic	✓		
Fefeh Clinic	✓		
Mecca Clinic	✓		
Vortor Clinic	✓		
Zordee Clinic	✓		
Cape Mount County			
Bendu Clinic	✓	✓	✓
Bomboja Clinic	✓		✓
Jundu Clinic	✓	✓	
Senbehun Clinic	✓		
Tallah Clinic	✓		
Gbarpolu County			
Gbarma Clinic	✓		
Kungbor Clinic	✓	✓	
Yangaya Clinic	✓	✓	✓
Wesua Clinic	✓		✓
Gbangay Clinic	✓		✓
Henry Town Clinic	✓		✓
Bambutu Clinic	✓		✓
Gbaryamah Clinic	✓		✓
Grand Cru County			
Gbalakpo Clinic	✓		✓
Barclayville Health Center	✓	✓	
Picicness Clinic	✓		
Wilsonville Clinic	✓		
Buah Clinic	✓		✓
Dwekan Clinic	✓	✓	
Gbanken Clinic	✓		

Rivercess County	Incinerator	Triage Unit	Water Tank
Kangbo Town Clinic	✓		
Boegeezay Clinic	✓		
Gozhon Clinic	✓		
Bodowhea Clinic	✓		
Kplor Clinic (Zammie town)	✓	✓	
Neezuin Clinic	✓	✓	
Rivergee County			
Putuken Clinic	✓	✓	
Pronoken Clinic	✓		✓
Sarbo Health Center		✓	
River Gbeh Clinic	✓		✓
Cheboken Clinic	✓		
Jakarken Clinic	✓		✓
Killepo Clinic	✓		✓
Nyenebo Clinic			✓
Sinoe County			
Pynes Town Clinic	✓		
Juarzon Clinic	✓		
Lexington Clinic	✓	✓	✓
Drapo Clinic	✓	✓	✓
Tubmanville Health Center	✓	✓	✓

MONITORING AND EVALUATION

The IPCA monitoring and evaluation team structure consisted of seven field-based M&E specialists with management and technical oversight from a Monrovia-based M&E officer. Each field-based officer was closely integrated into the training and supervision and supply distribution components to ensure that data was captured fully and accurately. They also helped county surveillance officers with epidemic surveillance data collection and reporting, with JSI resources and technical assistance. The Monrovia-based M&E team managed all incoming data from the counties, including the surveillance weekly reports, training and supervision figures, logistical data from facilities, and IPC supply consumption data via the SBRR and RDCT. JSI's M&E team also conducted two rounds of county-level data review meetings, at which all project data was shared with CHT supervisors (including all DHOs, health facility staff, and implementing partners).

The number of facilities supervised was substantiated by the compilation and submission of the facility audit tool, signed by the supervisor and the facility manager or OIC. Similarly, the number of facilities that received IPC supplies can be verified by the delivery notes and way-bills, copies of which are kept at the county depot-level. JSI's training database captures dates and facilities trained, and trainee duty stations and job titles/qualifications. Supervision results, including responses to audit tool questions, are stored in a separate database.

With JSI's support, county surveillance efforts experienced a strong resurgence over the course of the project. The effort to reactivate surveillance has been ongoing since June, with reactivation meetings bolstered by monthly support for transport and phone credit to aid surveillance data collection and reporting. All training and supervision focus counties are now participating in surveillance activities. During SQS trainings, JSI M&E specialists and lead partners performed SQS data entry and management.

TABLE 2: IPCA PROJECT PERFORMANCE INDICATORS, CUMULATIVE ACHIEVEMENT

INDICATOR 1: NUMBER OF HEALTH CARE FACILITIES SUPPORTED, BY TYPE ⁸	
Facility type	Cumulative achievement
Hospitals	37
Health centers	59
Clinics	628
TOTAL	724
INDICATOR 2: NUMBER OF HEALTH CARE PROVIDERS TRAINED, BY SEX ⁹	
Medical Doctor (KSKS)	50 Male / 5 Female
Certified Midwife (KSKS)	15 Male / 59 Female
Registered Nurse (KSKS)	121 Male / 167 Female
Trained Traditional Midwife (KSKS)	11 Female
Non-Clinical Facility Staff ¹⁰ (KSKS)	751 Male / 430 Female
Non-Clinical Facility Staff (SQS)	951 Male / 259 Female
TOTAL	1888 Male / 931 Female
INDICATOR 3: NUMBER AND % OF HEALTH FACILITIES SUBMITTING WEEKLY SURVEILLANCE REPORTS	
Number	159 ¹¹
Percentage	96%

⁸Facilities supported comprise the combined total for both project components, meaning that a facility was supported by the training/supervision component, the supply distribution component, or both.

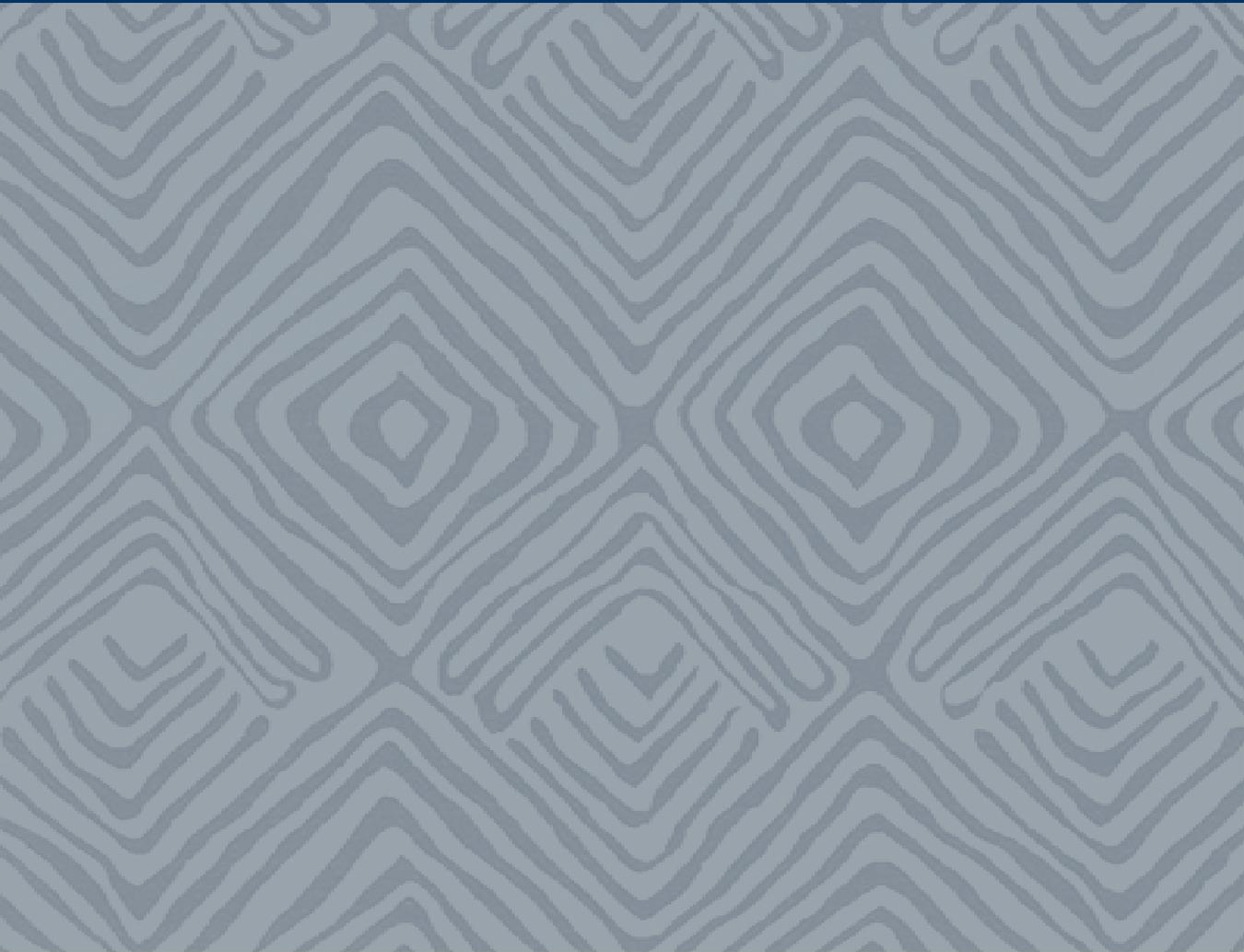
⁹IPCA training figures have been updated to exclude training totals from other partners, which were erroneously included in previous reports. Individual training beneficiaries have been counted only once—even if they received both KSKS and SQS training from JSI.

¹⁰JSI trained an additional 2,391 individuals in non-clinical positions between KSKS and SQS. These included: Lab Technicians, Lab Aids, Vaccinators, Registrars, Security, Dispensers, Non-Clinical Officers-in-Charge, Cleaners, and Nurse Aids.

¹¹The total number of facilities supported with IPCA surveillance interventions was 165; of those, 159 (96%) submitted regular surveillance reports as of the end of project.



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