

Project evaluation 

Integration of surveillance of priority zoonotic diseases into the existing polio eradication program in Ethiopia: processes, opportunities, successes, and challenges

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Integration of surveillance of priority zoonotic diseases into the existing polio eradication program in Ethiopia: processes, opportunities, successes, and challenges

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Abstract

Zoonoses are a major public health concern. The Ethiopia CORE Group Polio Project (CGPP) integrated active surveillance of the Priority Zoonotic Diseases (PZDs) using the existing polio infrastructure. The purpose of this review was to explore the processes, opportunities, successes and challenges of the integration of PZDs surveillance and response into the polio program. It documents reviews of reports, minutes, desk review of CGPP secretariat staff and interview of field-level coordinators. The project started with development of integrated plan of Polio and Global Health Security (GHS) project. The project team assembled technical experts from the CGPP Secretariat and partner to develop a revised and harmonized training guide and manual for the frontline community volunteers. The project trained 168 government surveillance staff from both human and livestock health sectors using a one health approach training of trainers. In 2020, the trained professionals further trained 5,481 community members, 2,808 frontline human health workers, and 1,589 animal health assistants (AHAs). Following the training, the project launched field activities and monitoring. In 2021, the project volunteers reported 263 PZDs alerts through the Open Data Kit system. In addition, 70 one health task force teams were established at Woreda, zonal and regional levels. The project community volunteers visited 683,479 households and reaching 1,765,584 people in financial year (FY) 2021 alone. Major opportunities for integration included budget integration, the existence of trained community surveillance volunteers, established linkages between frontline workers and community volunteers, and the existence of mapped cross-border activities. On the

other hand, problem of delayed in an integrated monitoring mechanism was the challenge for the implementation of one health approach.

Project evaluation

Introduction

The interaction between humans, animals, and the environment plays an important role in the emergence and spread of infectious diseases [1]. One category of infectious diseases are zoonoses, which are naturally transmissible from vertebrate animals to people or from humans to animals [2]. In nature, approximately 61% of the human pathogens are a major public health concern and lead to mortality in humans [3]. In addition, zoonotic diseases have the greatest impact in communities that keep livestock in low- and middle-income countries leading to a high morbidity and mortality in humans [4]. Zoonotic diseases spread and adapt to a new environment easily due to a number of interlinked ecological, economic, political, and social factors that operate at different levels [5]. A series of spillover incidents starting in animals may end up in humans as small outbreaks and then the pathogen adapts leading to human-to-human transmission [6].

Zoonotic illnesses are caused by a complex interaction of factors that might put humans, animals, and the environment in danger. People with direct contact with animals, especially people with a weakened immune system who handle pets or animals [7], including children under the age of five, put their hands and other objects in their mouths and do not always wash their hands thoroughly or frequently [8]. Humans routinely exposed to wild or domestic animals [9] are at significant risk for zoonotic diseases [10]. The presence of improper pet or environment care, such as handling a cat box, a pet with an infection, or bedding contaminated with urine, vomit, or excrement, are all red flags [11]. Furthermore, contact with young animals (puppies, kittens) or

any contact with a non-traditional pet (any pet other than a dog or cat). Examples of non-traditional pets include wild animals, exotic animals such as monkeys, ferrets, rats, mice, reptiles (snakes, lizards, and turtles), and birds are among them (including chicks and ducklings). Any interaction with farm animals or their surroundings (such as hay and barns) predisposes humans to zoonotic disease infections [12]. This may be common in pastoralist communities in developing countries such as Ethiopia. In response to this challenge, the one health approach has been advocated as the global framework for strengthening the collaboration and capacities of the different sectors and partners involved in health service delivery.

One health is a collaborative, multisectoral, and transdisciplinary approach that works at the local, regional, national, and global levels to achieve optimal health outcomes by understanding the interconnections between humans, animals, plants, and the environment in which they all live [13]. There is abundant evidence that no single sector or department can sufficiently manage public health challenges in any country, region or continent [14]. Experience from the fight against Ebola and the highly pathogenic avian influenza in the past few years demonstrated the effectiveness of multisectoral, multi-agency approaches [15], and government agencies, including those involved in human, animal, and environmental health, are assembled through one health coordination mechanisms [15]. One health is a critical approach that combines animal and human health and the environment. It is a severe and rising danger to global health, the global economy, and worldwide security. International efforts to mitigate the effects of emerging illnesses by focusing on post-emergency outbreak control, quarantine, medication and vaccine development need to be better integrated into one health. Newly emerging infectious diseases have caused widespread mortality and morbidity across cultural, political, and national boundaries, causing severe damage due to delays in detection and

response and increased global urbanization and connectivity [16].

Efforts to integrate priority animal diseases into the relatively well-organized human health sector requires a significant effort. It is useful to document challenges to integration to identify the origins and causes of disease emergence at local and regional levels from which zoonotic diseases may be captured in the disease surveillance, prevention, and control programs earlier in the chain of emergence, closer to their source, and more effectively limiting their subsequent spread and socioeconomic impacts. Therefore, this paper aims to describe the processes, opportunities, success, and challenges during priority zoonotic diseases (PZD) surveillance integration in Ethiopia's existing polio eradication program [17]. The priority zoonotic diseases were previously selected by a team of experts from different sectors and disciplines in the government [18].

Integration is aimed at accelerating decision-making processes and improving coordination thereby increasing the efficiency of the system. In a health surveillance system, integration has been defined as the sum of all surveillance activities which add up to the broader surveillance system. This may include many functions using similar structures, processes, and personnel. While integration within one sector is a common mechanism, "one health" surveillance integration places emphasis on surveillance activities that span multiple sectors including human, animal, and environmental health, and benefit from cross-fertilization and exchange to promote health for all [19].

Community-based surveillance contributes substantially to disease surveillance and the polio eradication initiative in Ethiopia. Starting in April 2019, CGPP Ethiopia began to contribute to the implementation of the global health security (GHS) project with funding from USAID. The GHS is addressed through implementing different action packages including detection, prevention, and control of zoonotic diseases. Therefore, CGPP has

integrated community-based surveillance (CBS) of prioritized zoonotic diseases into its polio project CBS infrastructure. Zoonotic disease prioritization is done based on standard indicators by key sector representatives [18]. In Ethiopia, the ministries of health, agriculture, environment, and wildlife participated in the prioritization of zoonotic diseases. Based on the nationally identified PZDs, the project chose to focus on anthrax, rabies, and brucellosis, working within the polio infrastructure [20]. CORE Group Polio Project (CGPP) Ethiopia conducted active PZD surveillance. Under this surveillance, several cases were reported, verified, investigated and responded to by both project and government health professionals in the human and animal health sectors. However, the surveillance for PZDs surveillance is not well-practiced and is very rarely done at the community level within the country. Therefore, the objective of this paper was to describe the processes, opportunities, successes, and challenges faced during the integration of surveillance of the selected PZDs using the existing polio surveillance program in Ethiopia. The CGPP regularly documents and shares PZDs surveillance experiences and integration of the USAID global health security project with the polio project.

Methods

Project area and setting: the CORE Group Polio Project (CGPP) in Ethiopia operates in 80 rural, pastoralist, and semi-pastoralist border woredas (districts) across the five regions of Gambella (13 woredas), Southern Nations, Nationalities, and People's (SNNP) (9 woredas), Oromia (11 woredas), Somali (27 woredas), and Benshangul-Gumuz (20 woredas) regions. These project areas are in hard to reach, areas bordering to South Sudan, Somalia, Kenya and Djibouti. The CGPP Secretariat is based at the Consortium of Christian Relief and Development Associations (CCRDA) and works closely with five international PVOs; Catholic Relief Services (CRS), Save the Children (SC), World Vision (WV), International Rescue Committee (IRC) and Amref Health Africa, and four local NGOs; Pastoralist Concern (PC),

Ethiopian Orthodox Church Development and Inter-Church Aid Commission (EOC-DICAC), Ethiopian Evangelical Church Mekane Yesus Development and Social Service Commission (EECMY-DASSC), and Organization for Welfare and Development in Action (OWDA) [21]. The ministry of health (MOH), CCRDA, World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), and Rotary International are also vital partners of CGPP Ethiopia. CGPP Ethiopia currently covers a population of 6,243,221, with 2,988,630 people under the age of fifteen, 218,513 children under the age of one, and 973,942 children under the age of five (Figure 1).

Community-based health volunteers recruited from the communities they serve receive training, mentoring, supervision, and assistance from CGPP. The CVs are not paid, but are given incentives such as project branded gowns and umbrellas and bags to carry supplies and instructional materials. The communities accept and trust them as they are part of villages, they serve. The CGPP expects CVs to work four hours a week (two hours per day and two days in a week) at a minimum [22-24].

Data collection and analysis technique: FY 20 to FY 21 data were collected from each implementing partner through conducting document reviews of existing project reports, weekly minutes of the CGPP secretariat and desk review of CGPP secretariat staff. In addition, field-level project coordinators were interviewed using open ended questions to verify the ground level project implementation process, successes, opportunities and challenges. The questionnaires were shared through email to all the 13 CGPP project zonal coordinators and their responses were summarized and checked with their bimonthly and quarterly reports. The CORE Group Telegram® and Open Data Kit (ODK) data-sharing platforms, bi-monthly and quarterly reports were used to review the existing data. All nine project partners' reports and minutes were reviewed and the five CGP-GHS secretariat technical staff experiences were included. The response from study

participants were grouped and regrouped and their information were organized based on the major themes namely processes, successes, opportunities, and challenges.

Discussion: process, successes, opportunities and challenges of the integration

Process of integration of priority zoonotic diseases surveillance

Harmonization of activity plans and budgets: the CGPP GHS Project is mainly focused on community-based surveillance for PZDs. The first steps during the integration of the Global Health Security (GHS) project into the existing polio project were activity planning and budget harmonization. The salaries of the already established staff, with responsibilities for both the polio and GHS projects, were split between the two projects in the main budget. One technical staff member, dedicated to the GHS project was fully funded by the GHS budget. Previously, the salary of all the project staff was covered by the polio budget. It was possible to allocate the GHS budget for project interventions and the staff salary to be covered by polio as it was. However, the CORE Group Secretariat made sure that the field staff salary was covered by both polio and GHS projects. Showing the contribution of GHS project for the staff salary helped the project staff to be accountable for the newly integrated GHS project. The staff managed the two projects in an integrated a way. In addition, different partners were mandated to categorize which activities needed to be covered by the GHS project and which ones were to be under the polio project budget. All levels of training on CBS were planned to be covered by the GHS project and the polio budget was more allocated to monitoring activities.

Development of the community-based surveillance training guideline and manuals for the priority zoonotic diseases: the CGPP team assembled an expert review team from the CGPP Secretariat and partner organizations to develop a

revised and harmonized training guide and manual. The team members had strong backgrounds in public health, monitoring and evaluation, communication, pediatrics and surveillance. The team reviewed and built upon the initial CBS training manual used for CGPP's Agence France-Press (AFP) surveillance. The other purpose of the team was the development of case definitions which was critical to the development of an integrated CBS system. The experts developed a community case definition for each of the PZDs. The development of case definitions for the different PZDs required experience and a detailed knowledge of community-based surveillance and the target diseases. Finally, the training manuals validated and approved by human and animal health experts divided into four clusters (Assosa, Diredawa, Hawassa and Jima). During the validation process, the anthrax case definition was modified. The newly developed and old training guidelines and manuals were merged prior to the start of the training of trainers (TOT) on CBS. Among the six project targeted diseases the anthrax community case definition is defined as "a person who gets ill within seven days after eating meat of livestock with fever, tremors, difficult of breathing or close contact with animals that have bleeding from nose, mouth and anus following death. Animals characterized by fever, tremors, difficult of breathing, blotting and then sudden death with frequent bleeding from nose, mouth and anus". The CBS manual on PZD was translated into three main local languages; Amharic, Oromia, and Somali. The language selected was based on the regional government official language. A total of 10,000 CBS manuals were printed and distributed to different woredas, zones and regions in the project areas.

Training of trainers: once the integrated CBS manual was developed, the project organized a TOT for government human and animal surveillance workers at regional and zonal levels. CGPP project implementing partners also participated in the training. The TOT training was

organized in four clusters in Jimma, Assosa, Diredawa, and Hawassa towns. A total of 168 participants attended the multidisciplinary and multisectoral TOT training. These included 43 professionals from livestock health, 47 from human health, and 78 from CGPP project implementing partners' organizations. The human and animal experts who took part in the TOT worked on surveillance. CGPP's prior experience focused on surveillance for human diseases. The trainings addressed the causative agent, magnitude of each disease, treatment, control, prevention, community definition, surveillance and reporting mechanisms for six diseases; AFP, measles, neonatal tetanus, anthrax, rabies and brucellosis. The TOT was used as an opportunity for experts from the animal health sector to validate the CBS training manual and the community case definitions for the PZDs. Valuable feedback was collected and incorporated during the final review and printing of the training manual. The trainees went back to their locality and cascaded the CBS training to woreda and frontline human and livestock health workers.

Cascade training for frontline workers: the other phase of the integration of PZDs into the community-based surveillance system was the delivery of cascaded training to CVs and frontline human and livestock health workers. The objective of the training was to promote community-based surveillance for vaccine preventable diseases surveillance (VPD) and PZDs. The participants were trained on each disease's etiology, cause, transmission, the community case definition, treatment, diagnosis, surveillance of the targeted diseases, prevention and control. The program utilized the existing government community structure in each of the project locations. The project worked with government health development army volunteers in the Benishangul Gumuz Region while working with project trained community volunteers (CVs) in all other project areas. CGPP trained the CVs in the new PZD surveillance techniques and deployed them to their communities to provide health promotion

and prevention interventions. However, regions like Benishangul Gumuz Region utilize the Health Development Army (HDAs) rather than CVs. Therefore, trainings and interventions in this region utilized HDAs instead of community volunteer.

In the financial year 2020/2021, a total of 5,481 community members, 2,808 frontline human health workers and 1,589 animal health assistants (AHAs) were trained (Figure 2). The CVs were trained at the district/woreda level. However, as the government does not allow had volunteers to work outside their own communities, the health development army leaders (HDALs) were trained by the health extension workers (HEWs) and AHAs at the kebele/village level. The trained HEWs and AHAs provided CBS training for 2,220 health development army leaders in the CGPP implementing partners, International Rescue Committee (IRC) and World Vision Ethiopia (WVE), implementation areas. The training was delivered at no cost since they were held at the health post levels. Paying HDALs is also forbidden by the government. This however, requires a great deal of organization and supportive supervision. The trained frontline workers participated in health education on VPDs and PZDs, active surveillance and disease reporting (Figure 2).

Project monitoring: following the training phase, the planning of project implementation and monitoring were the final steps of the startup of the project integration. The major consideration was to follow the implementation of the one health approach. This meant including the government livestock and environment staff in joint supportive supervision visits and review meetings. The supervision and review meetings were planned on a monthly basis at health post and animal clinic levels. The CORE Group Secretariat developed supervision checklist for the PZDs that have been used by field level supervisors. One of the keys focuses of supervision was to ensure that the training was cascaded. In addition, sharing of information amongst the human and animal health technicians on priority

zoonotic diseases was assessed. The supervision confirmed that training of key actors was carried out as planned by the project.

Opportunities for the integration: the planning for integration of PZDs surveillance into the existing community-based polio project began in November 2018. The integration officially began in April 2019 with an intensive review of the project budgets and activity plans. The interview as well as the document review showed the integration into an already existent CBS program had a number of key advantages as discussed below.

Budget synchronization: CBS generally increases the sensitivity of existing surveillance systems. Since the project had already allocated funds for AFP surveillance in the polio project, it was possible to add zoonotic diseases at a relatively low additional cost. Likewise, the GHS budget allowed the project to increase the number of trained CVs per village there by benefiting both zoonotic and polio disease surveillance. Although the main the addition of CBS funds was the reason for integrating the two budgets, the synergies created went beyond CBS. For instance, the costs of both the technical and monitoring support from experts from government and partners were integrated to be the same cost. The printing and distribution of the CBS training manual, reporting forms, the salaries of the project focal persons, transportation and other areas were shared between the polio and GHS budgets.

Existence of trained community volunteers: the CORE Group Polio Project and its implementing partners established a CBS system in 2003 using trained CVs. More than 10,000 CVs have since been trained on community-based surveillance for APF, measles, number needed to treat (NNT) and other WHO targeted diseases through the polio project. The training of community volunteers on surveillance is highly resource intensive. Additionally, this workforce of volunteers now possesses practiced skills and have experience working in the communities. Therefore, the ability to tap into this already established network is a

key resource for the integrated PZD surveillance work. This has provided access to a highly trained and competent CBS system. The CBS system utilizes house to house visits and visits to key social places and health related locales including churches, mosques, holy water, traditional healers, etc. Volunteers were given additional training to refresh their knowledge, skills and add on the ability to identify PZDs.

The strong linkages between CVs and frontline workers are a key strength of CGPP, and another resource available for integration. These already established relationships improve effectiveness and efficiency of the community-based interventions. These linkages led to better practice and documentation of joint planning, presence of regular monthly activity reporting and attendance at monthly review meetings, essential activities for program implementation at the community level. Leveraging these linkages saves resources and allows for more timely an efficient implementation of project activities.

Mapping of cross-border sites: in October 2012, CGPP strategically shifted its implementation areas to the international border areas which are hard to reach, pastoral and porous. The communities living in those areas have routinely crossed the border for different purposes, sometimes with their animals. The CGPP conducted cross-border mapping in 35 districts to provide information for routine immunization, immunization campaigns, and surveillance. Around 147 kebeles, 134 health facilities, 185 crossing points and 314 villages on international border areas in the 35 project districts were mapped. Locations were mapped using a global position system (GPS) and information was stored in the CGPP ODK server to be utilized for surveillance efforts and planning. The CGPP community volunteers were then able to provide integrated community-based surveillance for both human and animal cases, and provide community education at the crossing points.

Successes of integration of priority zoonotic diseases surveillance

Achievements from surveillance of priority zoonotic diseases: community-based surveillance occurs when members of a community actively participate in detecting, reporting, responding to and monitoring health events in their communities. Information discovered during surveillance should be shared with the local health authorities. Community-based surveillance helps detect outbreaks early, helps control outbreaks, and saves lives [25]. The trained CVs conducted regular suspected case search for AFP, measles, neonatal tetanus, anthrax, rabies, brucellosis and animal die offs in house-to-house visits and visits to traditional healers, and holy water sites. When CVs found suspected cases of the targeted diseases, they reported them to the nearby human and livestock health facilities using paper-based forms, a telephone or in person. The health workers validated the suspected cases to ensure that they matched the case definitions. Specimen samples were collected for validated cases and sent for laboratory diagnosis. Besides collecting a sample and taking it to the local facilities, they reported to the CGPP field officers to visit the suspected case for project related action.

The CGPP field officer completes the case investigation and reports the case using the ODK platform on the project server. This information is also shared through the national government system as well as to the CGPP headquarters (HQ) and donors. One key component of the CBS surveillance system is its high degree of sensitivity. It is structured with the purpose of identifying all potential cases that meet the community case definition and with the understanding that some suspected cases will meet the community case definition, but will not meet the clinical case definition. This improves the chances that all potential cases are captured and that nothing is missed. When cases meet the clinical case definition, samples are collected. If they do not meet this definition, no samples are taken. It is the mandate of the trained health professionals to

accept or reject cases reported by the CVs after validating them using a clinical case definition.

In FY 2021, CGPP trained CVs reported 263 PZDs alerts through the ODK system (Figure 3). The main PZD cases reported were animal bites (rabies) followed by anthrax (Figure 3). To our knowledge the CGPP is the first to conduct CBS for PZDs using trained community volunteers in Ethiopia. Our experience, successes and challenges of this pilot of CBS for PZDs have been shared using different data sharing mechanisms. CGPP has worked closely with human and livestock sectors to ensure that investigations and response are mounted in response to reported cases of PZDs (Figure 3).

Establishment and support one health task forces: in Ethiopia, a one health platform was started recently with working groups established at different levels. These working groups are expected to design, develop, implement, review, and follow the progress or status of the one health platform at the federal level. The National One Health Steering Committee (NOHSC) has been established as the core central point for one health issues at the national level. Under the NOHSC, there are technical working groups devoted to anthrax, brucellosis, communication, emerging pandemic threat (EPT), and rabies. The steering and working group platforms are expected to be cascaded down to the subnational levels. Very few partners have been working at the subnational level on one health coordination mechanisms and because of this, the OH platform could not move beyond the national level. Since 2020, CGPP, through its implementing partners, supported and strengthened the regional one health taskforces. In addition, CGPP established Zonal and woreda one health task forces (OHTF) (Table 1).

The main objective of establishing the OHTF at the sub-national level was to bring the human, animal, environment, and other OH stakeholders and partners together to discuss and implement joint OH activities. The project plans to establish seven

zonal and 80 woreda level OHTFs. So far, along with implementing partners CGPP established 70 OHTFs. These include 63 at the woreda level and seven at the zonal and regional levels (Table 1). The task forces have their own terms of reference. They have a committee that is led by a chair, co-chair, and a secretary who must be from human health, the livestock office and the environment sectors while other sectors or partners are members of the taskforces. At the woreda level where the environment is in the department of agriculture, the human and livestock health have been leading the taskforce as chair and co-chair on a rotating basis. The OHTFs promote the allocation of funds for PZD surveillance and interventions. They also evaluate the status of One Health activities in each sector, search for resources and strengthen the multisectoral approach in the prevention and control of the PZDs. *For instance, one of the interviewees explained that in one of the CGPP project woredas, the Godere woreda OHTF members, allocated funds for rabies vaccination and the management of stray dogs. They also mobilized transportation and other resources from different sectors for mass dog vaccination. In addition, one of the interviewees mentioned that in Sheko woreda the one health taskforce allocated 180,350 Ethiopian money from the revolving fund to support anthrax drug purchase and rabies vaccination.*

Community engagement: the CORE group polio project engaged communities to address problems using several key intervention categories including community awareness-raising and knowledge, attitude, and health behavior interventions. In addition, the community did house-to-house visits to identify suspected cases. For example, in 2021, CVs visited 683,479 households providing health education to 1,765,584 people. The CGPP utilized several community engagement strategies including community conversation/dialogues, coffee ceremonies, and the engagement and training of influential religious and clan leaders to address VPD and PZDs. In this community engagement strategies, challenges were raised

and solutions suggested on how to prevent and control VPDs and PZDs (Figure 4).

Cross border interventions: the CGPP has been working in hard-to-reach pastoralist communities. More than 50% of the project areas are international border areas which requires cross border collaboration for prompt information sharing and outbreak response. CGPP organized several cross-border coordination meetings between CGPP Ethiopia and CGPP Kenya to discuss polio and GHS project activities among communities that share borders. The meetings engaged government officials from the animal and human health sectors, and other sectors from both countries. The objectives of the cross-border meetings were to establish cross border one health platforms, establish data sharing mechanism and take corrective measures based on the information. Topics discussed included sharing of surveillance data, contacts and personal addresses; how to conduct joint integrated outbreak response campaigns; the coordination of cross border review meetings and conducting osynchronized polio campaigns. Action plans were drawn up and reviewed at each of the cross-border meetings and information sharing between the two countries has been initiated though this still needs to be strengthened. CORE group implementing partners have established 12 major crossing points for regular cross-border child vaccination. This intervention is very costly and requires prior mapping information of the crossing points. This is a very innovative approach which needs further advocacy for resource mobilization. There is also a need for expanded animal vaccination and animal diseases surveillance.

Integrated outbreak investigation and response training: in the Somali region, lack of coordination among the livestock and human sectors was among the main challenges during outbreak investigation and response. In response, the CGPP Secretariat organized an integrated training program, targeting both the human and livestock staff to discuss their challenges and improve collaborative outbreak management. The training

focused on addressing gaps and reached consensus to improve these challenges moving forward. In 2020, during routine surveillance in the Galadi Woreda, Dollo Zone, Somali Region, a CGPP trained community volunteer reported the sudden and unexplained deaths of camels. A joint zone and woreda outbreak investigation and response team travelled to the outbreak site. The team collected samples from sick and dead animals. The suspected cases report written by CVs were verified as a true event. The CGPP implementing partner working in the area supported sample collection and transportation and facilitated the trained community volunteers to educate the community on the control and prevention of anthrax. The CVs taught the community members to avoid eating the meat of animals that had died, not to drink raw milk, to avoid contact with the bodies of dead animals and to properly bury dead animals. In September 2021, The CGPP GHS project brought the human and livestock surveillance experts together from regional to health center levels for multisectoral outbreak investigation and response training. The training was given by national Ethiopian Public Health Institute (EPHI) and ministry of agriculture surveillance experts. It was the first training to bring the two sectors for PZDs outbreak management together at the ground level.

Challenges of integration: almost all of the field project coordinators and filed reports showed the integration faced challenges that summarized as follows.

Delayed multisectoral after action review: after action reviews (AAR) are a structured review or debriefing process for analyzing what happened, why it happened, and how things can be done better by the participants and those responsible for the project or event [26]. After-action reviews are useful for reflecting upon a project during and after its completion. Sharing the results from your AAR can help future teams learn your successful strategies and avoid pitfalls you have worked to overcome [27]. The CGPP provided reports to the next level of government for outbreak

investigation and response but no AAR was conducted. Timely multisectoral approaches for AAR are important for future prevention and control of zoonotic diseases outbreaks in animals and humans. The NOHSC organized an AAR in 2022 to review the camel death outbreak but this was long after the actual outbreak and failed to provide a timely documentation of lessons learned and recommendations.

COVID-19 pandemic: because of the pandemic, the CBS cascade training was not completed as planned and the training conducted during the pandemic was considerably more expensive due to requirements for reduced participant numbers to ensure safe physical distance between participants. This required a greater number of training sessions and greater facilitator costs as well as the need for more transportation. Due to movement restriction CVs house to house visit and community health education were reduced in FY 2021 as compared to the FY 2021.

Gaps in project monitoring: after the training was provided, the mentoring and monitoring of the implementation of project activities were the most important planned activities. The monitoring helps to assure the implementation of planned activities as per the plan and provides opportunities to take corrective action for any deviation of the project plan. Joint monitoring contributes to the achievement of project objectives which ultimately improves animal and human health. Implementing partners were fully aware of the fact that GHS has to be addressed through the one health approach. However, field staff of some implementing partners organized joint supportive supervision with only the human sector. The same phenomena were seen during project review meetings. Generally, the field staff has taken more time to practice the one health approach since they previously worked only with the human health experts.

Conclusion

CORE Group Polio Project (CGPP) pioneered community based VPD surveillance in 2003 and similarly pioneered in the integration of PZDs community-based surveillance in April 2019 in the country. During the integration process, CGPP followed several steps such as activity and budget harmonization, developing integrated CBS training guideline and manual, delivered TOT and cascaded trainings and project monitoring. Budget synergizing and existence of trained community volunteers were the opportunities for integration. Integrated surveillance, establishing regional and district one health teams, community engagement and outbreak reporting and response were some of the successes of the project integration. Documenting the process, opportunities, challenges and successes provides insight for others to implement similar interventions and provides lessons for the integration of other interventions into the CGPP model.

Competing interests

The authors declare no competing interests.

Authors' contributions

Muluken Asres Alemu developed data collection tool and facilitated the data collection, summarized reports, analyzed and summarized issues in the form of results, and incorporated comments forwarded from co-authors and editors; Filimona Bisrat gave prior direction on the manuscript title, facilitated the write up, and commented the document; Innocent Rwego, Kathy Stamidis, and Lee Losey provided helpful and valuable technical supports, shape and edited the document; Negussie Deyessa guided how the manuscript to be outlined, enrich the document with helpful references and supported on the organization of the document. All the authors have read and agreed to the final manuscript.

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Table and figures

Table 1: the number of one health taskforces established at sub-national level by CGPP implementing partners

Figure 1: map of CORE group polio project intervention areas (source-CORE group polio project 2017)

Figure 2: number of people trained on VPD and PZDs in the CGPP project areas in 2020-2021

Figure 3: suspected priority zoonotic disease alert cases reported by community volunteers

Figure 4: number of households visited and people reached during community engagement session

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Table 1: the number of one health taskforces established at sub-national level by CGPP implementing partners

Implementing partners*	No. of target woreda	No. of OHTF established	Remark
Amref health Africa	7	7	One of these is a zonal OHTF
Catholic relief service	15	10	Seven woredas are from Siti Zone and three woredas from Metekel Zone
EECMY-DASSC*	12	12	Three woreda OHTFs are in SNNPRd and 9 woreda OHTFs are in Gambella Region
EOC-DICAC\$	13	7	One is Borena Zone OHTF; all OHTFs here are from Borena Zone, Oromiya Region; a OHTF has not been established in Kelem Wolega Zone due to local security conflict
International rescue committee (IRC)	12	10	Two zonal OHTFs and four woreda OHTFs from BGRf and four district OHTFs from Gambella Region established
Organization welfare development actor (OWDA)	10	10	100% of the district OHTF established
Pastoralist concern (PC)	5	5	100% of the district OHTF established
Save the children (SC)	5	5	100% of the district OHTF established
World vision (WV)	4	4	100% of the district OHTF established
Total	83	70	

SNNPRd: Southern Nations, Nationalities, and Peoples Region; BGRf: Benishangul Gumuz Region; EECMY-DASSC*: Ethiopian Evangelical Church Mekane Yesus-Development and Social Service Commission; EOC-DICAC\$: Ethiopian Orthodox Church Development Inter-Church Aid Commission; OHTF: one health task forces; CGPP: CORE group polio project

ETHIOPIA



Figure 1: map of CORE group polio project intervention areas (source-CORE group polio project 2017)

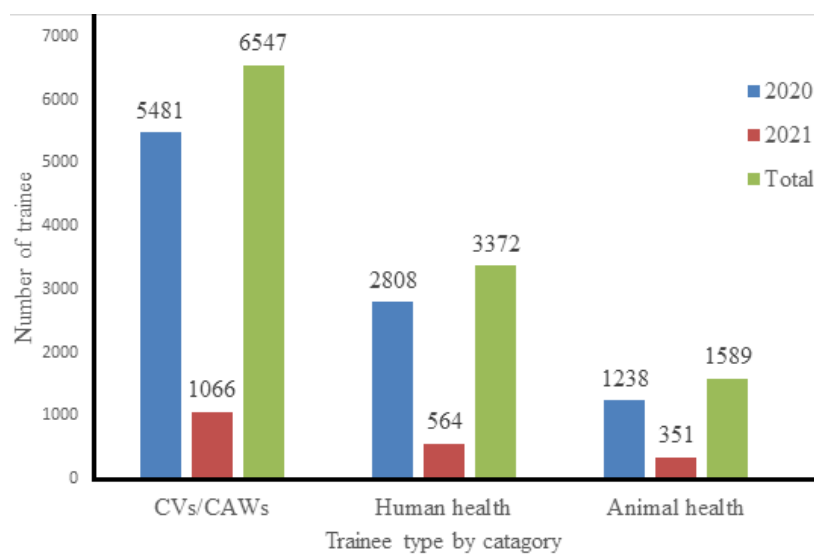


Figure 2: number of people trained on VPD and PZDs in the CGPP project areas in 2020-2021

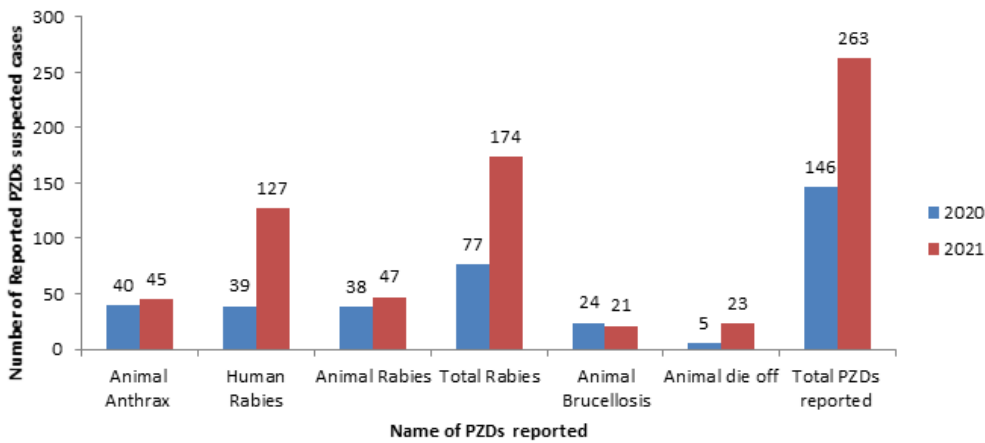


Figure 3: suspected priority zoonotic disease alert cases reported by community volunteers

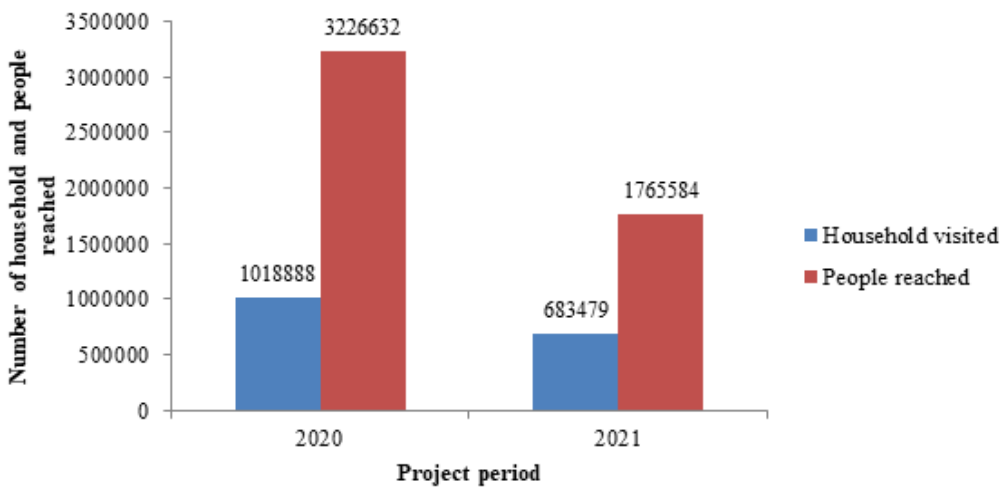


Figure 4: number of households visited and people reached during community engagement session