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The True Cost of Delivering COVID Vaccines: South Sudan

By July 18, South Sudan was able to administer the 60,000 doses of COVID-19 vaccine they had in stock through a series of smart investments in delivery, training, and social mobilization coordinated with several different partners. As new doses are projected to arrive in country in August, South Sudan continues to reinforce gaps in the health systems to make COVID-19 vaccinations possible without disrupting existing health services.

CARE’s estimated delivery costs from “tarmac to arm”¹ for vaccines in these areas are **\$9.97 per dose of vaccine administered, or \$22.22 per person fully vaccinated.**²



\$22 per person
Cost to deliver COVID-19 vaccines in South Sudan.

This is **six times more expensive** than current global estimate for delivery costs. For some actors providing vaccinations in South Sudan, the cost has been as high as \$20 per dose administered when they include all costs. That’s because the health system in South Sudan is fragile, and it was already struggling to deliver even routine services. South Sudan is one of many health systems around the world that will need additional personnel, resources, and infrastructure to effectively deliver COVID-19 vaccines to at-risk populations, especially in hard-to-reach areas. The exact cost will continue to evolve as new vaccines arrive in country and the country vaccinates new groups of people.

In fragile health systems, it costs 6 times more (or higher) to deliver COVID-19 vaccines than current projections estimate.

No one is safe until everyone is safe. **We must fund additional delivery costs for weaker health systems** to ensure that we stop the COVID-19 pandemic and reduce the spread and emergence of new variants. It also makes the best use

¹ “From tarmac to arm” includes only the costs of last-mile delivery of the vaccine, and excludes the price of purchasing vaccines or delivering them from the manufacturer (in this case, in India) to South Sudan.

² The WHO estimates the cost of delivering the second vaccine is 1.2 times the original dose to account for extra wastage of doses.

of the billions of dollars we have already invested in COVID-19 vaccines.

CARE in South Sudan

CARE South Sudan aims to deliver 135,000 COVID-19 vaccines, covering Pariang County, Yida, Abiemnoum, Wau, and Boma. As of July 18, 2021, CARE had vaccinated 3,798 men and 1,668 women within weeks of receiving doses. This speed is possible because of pre-existing relationships with the Ministry of Health and local health service providers in South Sudan, previous investments in mobile health care—including vaccination campaigns—and extensive work preparing communities to ensure they are ready to take the COVID-19 vaccine when it is available. This gives CARE a unique position to understand the costs of delivering vaccines in South Sudan.

South Sudan Context

South Sudan serves as a critical example of the investments we need to make in national health systems to ensure that everyone is safe from COVID-19. While South Sudan prepares for the arrival of new COVID-19 vaccines—hopefully in August—and planning the logistics of more mobile vaccination campaigns, they are bracing for an influx of the Delta variant that has been detected in neighboring Uganda.

South Sudan **lost 132,000 vaccine doses** because they needed more investment in vaccine delivery costs.

Without an additional investment in vaccine **delivery** to patients at the last mile, by May of 2021 South Sudan had to return 72,000 doses that they could not effectively deliver and destroy 60,000 expired doses that expired. In contrast, smart and consistent investments in delivery in June and July meant that South Sudan was able to deliver their remaining vaccines before the expiration date of July 18. There are 60,000 more doses projected to arrive in August, and it is critical to continue these investments in delivery.

While the first round of COVID-19 vaccines were largely administered in health centers, subsequent rounds will need to be more mobile and go to rural areas. Even the current round of vaccines had highly variable costs, up to \$20 per dose in some cases. This will present additional logistics needs to reinforce the gaps in the existing health system and ensure that essential health services are not disrupted. Additionally, depending on which vaccines arrive in August, there may be additional investment needs in infrastructure or retraining staff.

Investing in the cost of delivering vaccines to the 20% of people most at risk by the end of 2021, and to 80% of the population as quickly as possible, is the only way to slow the pandemic. In the case of South Sudan, that requires a minimum of \$63 million invested in delivery alone—potentially as high as \$126 million. South Sudan cannot do it without extra investment in delivery. That must be **grants, rather than loans with interest**.

What is included in these costs?

The strategy for COVID-19 vaccines in South Sudan is designed to reinforce, support, and extend the existing health system in South Sudan and ensure that investments allow continued health services—such as emergency care and maternal and child health—while adding the support needed to include COVID-19 vaccination campaigns. Rather than setting up a temporary parallel system, the COVID-19 vaccination work fills gaps that health centers and the Ministry of Health have identified in their current capacities. These efforts will not only ensure health care now and vaccine coverage today, but will also provide long-term sustainability in the health system to prevent and respond to future pandemics and health needs.

Additional vaccinators and service providers to fill gaps in the system: South Sudan already had low vaccine coverage—about 50% of the children who need vaccines get them—and not enough vaccinators or health workers to cover the existing needs, much less launch a whole new campaign with vaccine reaching a different

population. Rather than overburdening the system by diverting existing staff, or creating a short-term group of vaccinators who focus exclusively on COVID-19, CARE is supporting 191 additional vaccinators—including 46 who are focusing on COVID-19 vaccines, who receive the same training as long-term staff and rotate between doing routine childhood vaccinations and participating in the COVID-19 campaign. This ensures quality training and fair working conditions for all vaccinators, and that health workers can get a break from COVID-19 conditions to improve worker wellbeing. These new staff will remain a part of the South Sudanese health system and continue to reinforce health services in the long term.

Community education and mobilization. The budget includes support to community health volunteers who help organize the community vaccination campaign, and who work with community members before vaccines arrive to ensure that people understand why vaccines are important and that they are safe. Working with community leaders, hosting launch ceremonies to help people understand why vaccines are important, and having regular meetings with local government officials to make sure that the vaccination plans are on track are all part of the budget that make it more likely people will get vaccines. The budget also includes a range of communications materials—from fliers to billboards—to ensure that people have the information they need.

Additional support staff. After working to identify gaps in the existing system, the COVID-19 vaccine budget includes funding for drivers to help transport vaccines, supervisors who support vaccination teams, volunteers who help enforce social distancing at the vaccination site, medical staff on hand in case of emergencies.

Daily compensation for people working on COVID-19 vaccines. In line with the salary rates set out by the Ministry of Health, CARE is paying vaccinators \$5.50 a day for 5 days each month that they are engaged in COVID-19 vaccinations. Volunteers, social mobilizers, drivers, and security personnel are all getting the \$5.50 every day they work on COVID-19 vaccines. Supervisors make \$14 per day, and medical staff get \$30 per day to support the vaccination teams. These rates are equal with salaries across the health system with MoH guidance so as not to create inequalities and gaps between health worker and creating a disadvantage for essential health workers providing routine services.

Salaries for health care workers. Neither the CARE budget nor the CVIC tool includes full-time salaries for existing health workers.³ However, those salaries are an opportunity cost that we must account for, as both new staff and existing health workers are involved in COVID-19 vaccines interwoven with their existing duties. This is designed to ensure that health workers can ensure the delivery of COVID-19 vaccines without disrupting their regular duties, whether those are childhood vaccinations, pre-natal checkups, or routine health services.

Training and Logistics. Training costs \$30 per day per person—including vaccinators, volunteers, and social mobilizers. Logistics include fuel for vehicles, Personal Protective Equipment, coordination costs, and other supplies. As new vaccines arrive in South Sudan, the training cost may go down as vaccinators become familiar with the work. This could change if new vaccines—Pfizer or Moderna—arrive in country and new training is required for staff on the new vaccines. At the same time, logistics costs will rise as the vaccines need to move from a center-based delivery to more mobile delivery in rural, harder to reach areas.

Vaccine tracking. The budget includes a range of materials—from vaccine cards, consent forms, and tracking forms—to ensure that people have a record of their vaccinations and that the health system can set up follow-up appointments and track doses of vaccine. These costs are currently covered by the Ministry of Health and UNICEF, rather than a part of CARE's budget, but are a critical component of the delivery costs.

³ CARE only supports frontline health workers in the areas where we provide health services. Full time health care staff are employed by the Ministry of Health, and covering those salaries is the Ministry of Health's responsibility.

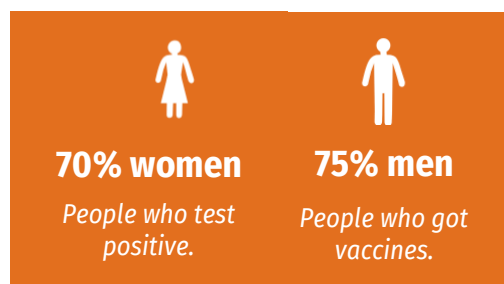
Who is covered in these costs?

There are two primary modes for delivering vaccines: based out of health centers and as mobile vaccine campaigns. In South Sudan, the first round of COVID-19 vaccines have largely been delivered out of health centers. As new vaccines come into South Sudan, that will pivot to more mobile based delivery models to reach at-risk populations without access to a health center. In both cases, the personnel requirements are designed with an eye to reinforcing the long-term strength of the health system and filling existing gaps.

The mobile model assumes that a 4-person vaccination team can vaccinate 80 people per day and will work for a 5-day campaign to vaccinate 400 people. This covers 2 days for a social mobilizer to work with a community before vaccinations arrive to ensure that people are ready to receive vaccines. The costs also include salaries for team supervisors, county supervisors, and medical officers who support multiple vaccination teams.

Center-based delivery model must fill existing personnel gaps and adding staff to cover demands of including COVID-19 vaccines without disrupting childhood vaccinations, sexual and reproductive health services, or emergency medicine. Center based teams vaccinate fewer than 80 vaccines a day over more days.

Gender equality



Gender equality is a critical investment area to both support frontline health workers—70% of whom are women—and to ensure that vaccines reach everyone who needs them. In South Sudan, **more than 70% of people testing positive for COVID-19 are women, but more than 75% of people getting vaccinated are men.** Women are more likely take care of the sick, and wait at water points and other places where they could be exposed to COVID-19, which increases the rates of COVID-19 among women. However, a combination of social norms that put women last for access to

services and additional mobility restrictions for women makes it hard for them to travel to health centers. There is also a mistaken but persistent belief that COVID-19 primarily affects men, which means that women have less access to vaccines. Finally, many women are reluctant to get the COVID-19 vaccines because they are concerned it will make them infertile. We need to design specific interventions to ensure that **women can fairly access the COVID-19 vaccine and feel safe and confident doing so.** Investments must also take into account the design of community mobilization and education campaigns in order to overcome the barriers women face getting vaccines. Without that investment, we will never vaccinate enough people to curb the pandemic.

Triangulating the results

Using the budget from CARE's vaccine delivery micro-plan, paired with the South Sudan COVID-19 National Deployment and Vaccination Plan from February 9, 2021, CARE also completed the UNICEF [COVID-19 Vaccine Introduction and Deployment Costing \(CVIC\) Tool](#) to cross check the results of CARE's estimates in the areas where we work. The CVIC tool is the internationally accepted basis for calculating full delivery costs in each context. Working from the basis of existing WHO estimates and complementing them with CARE's costing data, that tool provides a cost of \$21.84 per person fully vaccinated. That gives us confidence that CARE's \$22 estimate is an accurate reflection of the true delivery costs in South Sudan. Confirming with other organizations delivering vaccines, some saw costs as high as \$20 per dose, which implies CARE's estimate is on the low end of reasonable investments, and even more investments will be required as the vaccine delivery situation evolves.

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Annex 1: Calculating personnel salary opportunity costs.

Including fair salaries for frontline health workers costs \$0.90 per dose or \$1.80 per person fully vaccinated. We have calculated that figure using the following data and assumptions.

Population to vaccinate. South Sudan aims to vaccinate 2,400,000 people by the end of 2021.

Vaccination teams: Each vaccination team is 4 people and can vaccinate 80 people per day. That implies that each person on the team can vaccinate 20 people per day.

- 20 people per day x 20 working days per month times 6 months = 2,400 doses of vaccine per worker.
- To vaccinate 2,400,000 people within six months (or administer 4,800,000 doses of vaccine). That requires 2,000 members of vaccination teams working for 6 months.
- An average salary for a health worker at this level is \$300 per month. $\$300 \times 2,000 \text{ people} \times 6 \text{ months} = \$3,600,000$

Supervision and support for vaccinators: Additionally, each team and each county has a supervisor that supports the teams. There are also medical officers that provide support to teams.

- Two team supervisor for every county = 158 team supervisors
 - Team supervisors get \$450 per month
 - $\$450 \times 158 \text{ supervisors} \times 6 \text{ months} = \$426,000$
- One county supervisor for county = 79 county supervisors
 - County supervisors make \$580 per month
 - $\$580 \times 79 \text{ county supervisors} \times 6 \text{ months} = \$274,920$
- One medical officer for every state = 10 medical officers
 - Medical officers make \$580 per month
 - $\$580 \times 10 \text{ medical officers} \times 6 \text{ months} = \$34,800$

Total additional costs for supervisory and medical officer salaries = \$736,320

Total costs. Total personnel costs = \$4,336,320. $\$4,336,320 \text{ personnel costs} \div 4,800,000 \text{ doses} = \0.90 per dose . **Additional personnel costs are \$0.90 per dose or \$1.80 per person fully vaccinated.**