



Urgent Request for Proposal (RFP):
Evaluating the Supply Chain Cost and
Cost Effectiveness of Drones for Vaccine
Transport in DRC

May 2020



I. Organization Overview

VillageReach is an international non-governmental organization, with headquarters in Seattle, Washington, that works closely with governments to address the challenges of providing health care in low-resource settings. VillageReach's mission is to save lives and improve public health by increasing access to quality health care for the poorest communities at the last mile, or the point at which services are delivered.

VillageReach has been working in the Democratic Republic of the Congo (DRC) since 2015 supporting the improvement of the healthcare supply chain. Currently, VillageReach is working with the DRC government and Gavi, the Vaccine Alliance to integrate drones into the health supply chain in the province of Equateur.

II. Project Overview

Vaccines have the potential to save lives, but in low-resource environments such as the DRC, they are frequently delayed or don't reach people living in hard-to-reach or geographically isolated areas. Equateur province is among the lowest-performing provinces in the DRC when it comes to immunization rates. As of May 2017, only 67 VillageReach has been working with the Government of the Democratic Republic of Congo (DRC) and Gavi, the Vaccine Alliance, to test and integrate drones into the existing health supply chain. We have completed Phase 1, Permissions, Preliminary Design, and Testing in 2019. Phase 1 successfully showed stakeholders that a drone transport system can lead to more timely and consistent bi-directional health product deliveries. Stakeholders expressed interest in rapid scale up to additional health centers and provinces, working towards the ultimate goal of vaccinating all children. Beginning in March 2020, Phase 2 will focus on introducing drone transportation into the routine immunization supply chain to increase vaccine availability at some of the most remote or hard-to-reach health centers in Equateur province for a period of 12 months.

Immediately following the successful Phase 1 demonstration flights, government stakeholders and donors expressed a need for data around the potential effectiveness, costs, and cost-efficiencies of introducing drones into public health supply chains in DRC to inform future investment decisions. Phase 2 will generate robust evidence based on real-world implementation to inform strategic decision-making around the following research questions:

1. How does the introduction of drones into public health supply chains impact the performance of the immunization supply chain in remote areas of Equateur, DRC?
2. What considerations do you need to make related to planning, training and operations to integrating this new mode of transportation into the existing supply network?
3. What are the costs associated with integrating drones into the immunization supply chain in Equateur, DRC? Are drones a cost-effective intervention for future scale-up? If yes, under what circumstances? How do you chose what to deliver via drone verses land based transport?

VillageReach is seeking an evaluation firm or expert to assist in the protocol development, data collection methodology, data analysis and reporting to evaluate the third research question above: **what are the supply chain costs and cost-effectiveness of drone transport for health products in Equateur Province, DRC.** Note that the bi-directional drones will land at the health facilities and return with lab samples and reports, and may transport additional health products on an ad-hoc/as-needed basis, however the focus of the above evaluation will be mainly on delivery of routine childhood vaccines.

We expect results from this assessment to be shared within DRC and globally through presentations and conference abstracts, as well as peer-reviewed journal articles using a *relatively* replicable methodology to influence future financial analysis of implementing drones for cargo delivery in health systems.

III. Schedule of Events

VillageReach will evaluate all responses to this Request for Proposal (RFP). The current estimated timetable for the selection process is summarized below.

Milestone	Completion Date
Release RFP publicly	May 5, 2020
Vendors submit proposals to VillageReach	As soon as possible, applications will be reviewed on a rolling basis.
VillageReach finalizes Vendor selection	May 18, 2020

VillageReach reserves the right to make any changes to the events and schedule at their discretion.

IV. RFP questions

Questions regarding this RFP are encouraged and should be submitted through e-mail to the address listed below in advance of the submission deadline. Should a prospective Vendor perceive any material ambiguity, conflict, discrepancy, omission, or other error in this RFP, the vendor should send a question to confirm or clarify the information in question. The Vendor may request a meeting or conference call with VillageReach to clarify the requirements of this RFP.

Email: procurement@villagereach.org

V. Background

VillageReach has been supporting the government of DRC to strengthen the immunization supply chain in Equateur and other provinces since 2015. Our work on Next-Generation Supply Chains (or *Nouvelle Génération de la Chaîne d'Approvisionnement/NGCA* in French) is

described in *“Increasing Access to Health products in the DRC”*¹ and *“Leading from all levels: building supply chain leadership capacity in Equateur Province, Democratic Republic of Congo.”*²

Currently the provincial Expanded Program for Immunization (EPI or PEV in French) delivers immunization product via two distribution methodologies:

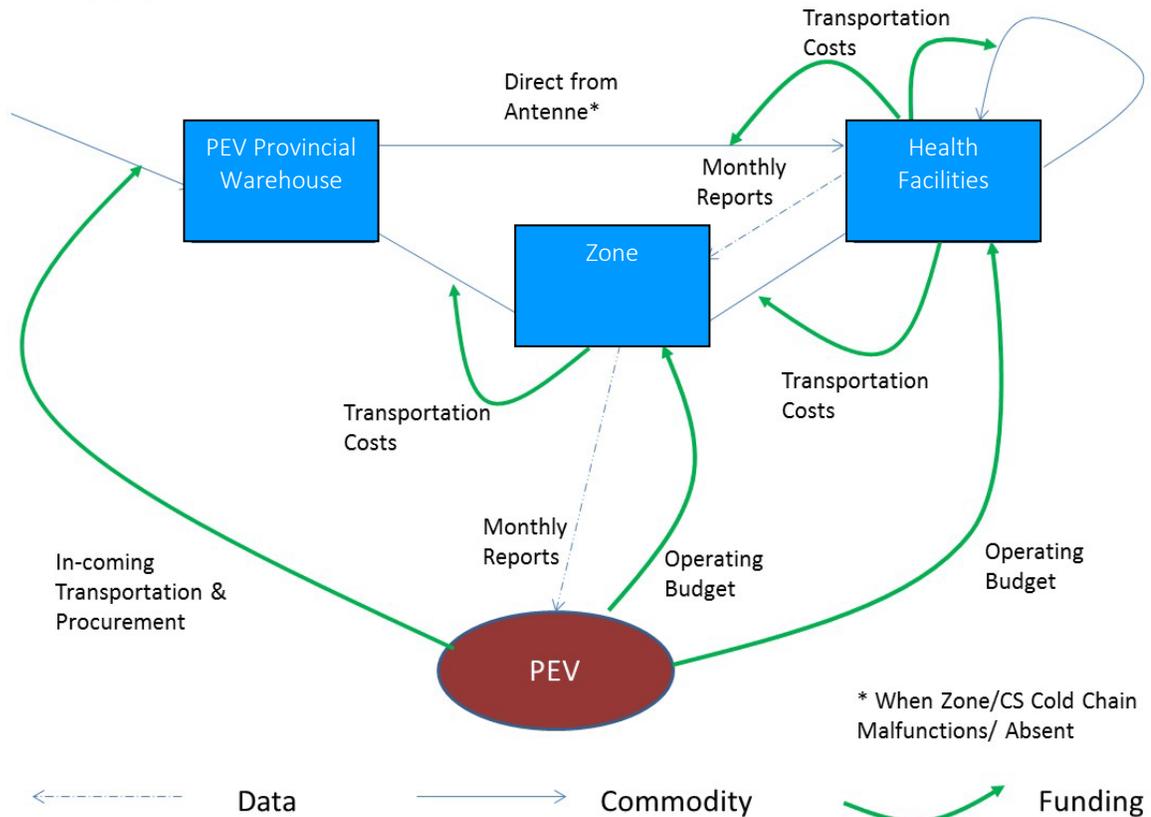
Traditional PEV supply chain

Equateur is divided into 18 health zones each with its own zonal warehouse (BCZS). The traditional PEV supply chain generally operates within these administrative divisions as captured in Figure 1. The **PEV Antenne** in Mbandaka is the central store for vaccines in the province and is the most upstream tier within the provincial PEV supply chain. The administrative center for the PEV is also located at the PEV Antenne which is responsible for procurement (including accompanying transportation costs) for the province and allocating funds throughout the supply chain to support distribution. **Zone warehouses** are generally the next tier in the supply chain as long as these warehouses have functional refrigerators or cold chain equipment (CCE). Zone warehouses sometimes receive an operating budget from the PEV and use this budget among other things for transportation expenses to collect vaccine stocks from the PEV Antenne. The next tier of the supply chain are health facilities that have CCE. The facilities collect vaccine stocks from the zonal warehouse. These facilities collect stocks not only to support their own needs but also to support other nearby facilities that do not have CCE. These facilities typically collect vaccine stocks monthly from the Zone warehouse, sometimes paying out of health workers pockets for transportation. The final tier of the supply chain can be facilities that do not have CCE. These facilities are responsible for collecting vaccines, generally weekly, to support vaccine days or vaccine campaigns from either other facilities with CCE or the Zone warehouse or the PEV Antenne. Information/data flows through the supply chain are generally facilitated by monthly reports from health facilities to Zones and from Zones to the provincial PEV.

¹ <https://www.villagereach.org/wp-content/uploads/2018/09/Increasing-Access-to-Health-Products-in-the-DRC.pdf>

² <https://gh.bmj.com/content/4/5/e001756>

Figure 1 Traditional PEV Supply Chain



Optimized NCGA Supply Chain

Under the NCGA Initiative, supply chain responsibilities are consolidated at the provincial level, where health officials oversee the delivery of vaccines and health products to health centers. Products are delivered directly from the PEV Antenne in Mbandaka to a subset of health centers that have CCE. This provides opportunities for ongoing training and support at the health facility, in addition to Zone level. For instance, supervisory visits from logisticians ensure that personnel are correctly managing stock and reporting on regular intervals. This direct data collection leads to better visibility of stock levels and other performance information from the health centers. Most importantly, it liberates health workers from the time-consuming and costly obligation to collect supplies on their own, allowing them more time to dedicate to their primary duty of delivering care to patients in their communities. VillageReach and the Ministry of Health have been leveraging resources from donors to support direct distribution of vaccines. These resources are used to cover supply chain of vaccines from the provincial warehouse (PEV antenne) to the health facilities and the Zone office.

In the first half of 2019, this NCGA approach was financed by BMGF through VillageReach, who directly paid distribution expenses such as vehicle rentals, fuel, and per diem of the provincial and zonal distribution teams. Currently, direct deliveries are financed by GAVI via

the DPS while VillageReach continues provides technical assistance, but no financial assistance.

Phase 2 Drone Distribution System under NGCA

Building off the principles of NGCA, VillageReach is working with the DRC MoH to integrate drones as a complimentary mode of transportation into the Equateur immunization supply chain. Phase 2 will focus implementing routine drone flight operations for approximately 12 months to ensure frequent and consistent product deliveries by drone to very remote or difficult-to-access communities. While Phase 1 demonstrated that drone deliveries to a rural health center could be conducted, the demonstration flights were limited to one health center that was purposefully selected to be close to Mbandaka, providing relatively easy access for officials and the project teams. In Phase 2, the number of drone delivery sites will increase to 25-35, and the selected sites will be hard-to-reach, often separated by rivers that are impassable during the rainy seasons, or nested deep in the equatorial forest. As a service delivery company, Swoop Aero will provide the drone delivery service, similar to a 3PL.

Previous NGCA Cost Evaluation

When the NGCA Initiative began, VillageReach conducted an activity-based costing study to determine how changes to the supply chain impacted costs. Costs were measured in September 2017 and again in February 2018 after the NGCA Initiative had been fully rolled out in three health zones of Equateur. Peer-reviewed publication is in the final stages but results showed a decrease in total supply chain costs by 34%. The most dramatic reduction in costs was a 40% decrease in transport costs, mostly at the zone and service delivery level. This reduction occurred because health staff were no longer required to travel to the province or to the zones each month to collect vaccines. Transport costs increased slightly at the province level to pay for fuel and delivery services, but since deliveries are now made every two months instead of monthly, the increased costs at the provincial level have been marginal.

Now as we are introducing drones – an additional and novel mode of transportation – into the system, we must again perform a comprehensive supply chain cost and performance evaluation to determine how changes to the supply chain impact cost.

VI. Evaluation Approach and Methodology

The overall aims of this evaluation is twofold: 1) establishing the comprehensive cost associated with introducing drones into the Equateur Immunization Supply Chain, and 2) understand short-term drone transport cost-effectiveness to inform potential scale up to a Phase 3 implementation. Following the assessment of supply chain costs relative to performance, an important deliverable for VillageReach is recommendations for potential scale-up in Phase 3 to the government of DRC. These recommendations may describing the actual costs of drone deliveries for this particular use case in DRC and under what circumstances drones will be cost-competitive when compared to other alternative means of transport, when utilized on a larger scale. Furthermore, guidance on the circumstances that are favorable for drone deployment is

important. The decisions for the government to integrate emergency supply or other use cases will be benefit for Phase 3.

We expect results from this assessment to be peer-review published using a *relatively* replicable methodology to influence future financial analysis of implementing drones for cargo delivery in health systems.

Supply Chain Costing

The first part of the assessment will evaluate the impact of drone deliveries on vaccine supply chain costs, and very likely on lab transport costs, given that lab samples will be sent from health facilities by drone (in other words, drones would transport vaccines one-way, and return with lab samples as needed).

Additionally, we want to better understand and quantify the actual costs of drone logistics operations in general, over the 12 month period, from a governmental perspective. This will take the form of an activity-based operational cost assessment of the supply chain costs for 25-35 health facilities receiving immunization drone deliveries (intervention facilities) as well as control facilities receiving immunization products via traditional modes of transportation (vehicle, boat, motorcycle, walking). The comparison facilities will be agreed upon with VillageReach and the Equateur provincial health division/PEV.

Supply chain costs will be evaluated from the highest tier in Equateur province (Provincial level) down to the point of service delivery (health facility level). Ideally, data would be collected monthly, throughout the 12 month period, to identify trends in costs as the project is implemented, as well as any confounding variables that may act on costs. Separately, we will quantify “start-up costs” associated with beginning drone deliveries such as infrastructure investments, training, community education campaigns, etc. which has be separated from the overall system costs for Phase 3 scale up. The costing methodology used must be in line with standard public health costing methodologies, such as the USAID|Deliver approach³ but may be expanded on.

To address the challenges related to the often ad-hoc or informal supply chains at the subnational levels, an activity based costing approach must be informed by primary data collection at health facility level. ***Primary data collection will be done by VillageReach’s team in Equateur, not by the external evaluator.*** Data collection intervals and methodology (interview vs. time in motion) will be determined based on financial and operational feasibility during the protocol development. When aggregate costing data are unavailable and must be estimated, random and purposive sampling methodologies may be applied where appropriate, with the choice of methodology being dependent on the situation. We expect data to be scarce and expect the costing firm/expert to be flexible with the available data inputs and to advise on the best type of data to collect given the realities on the ground. **Based on previous experience, assessing what is available and then adjusting the approach based on what data are actually available is absolutely necessary.** There is no single government ERP system where this data lives. Data will need to be sourced from multiple systems, DRC health partners and informed estimations.

³ https://publications.jsi.com/JSIInternet/Inc/Common/download_pub.cfm?id=18156&lid=3

This cost evaluation will take place in parallel to the outcome (performance) evaluation, which will be conducted by VillageReach and external evaluators. As part of the outcome evaluation, there will be ongoing data collected on key supply chain indicators, such as availability of vaccines in health facilities; number of stockout days; losses/wastage rates; and monthly average consumption of vaccines (as a proxy for vaccination rates). Additionally, at three or four points during the Phase 2, VillageReach will conduct primary data collection and validation in health facilities served by drones and control facilities not served by drones. This in-depth data collection will happen at baseline (before drone flights begin), once or twice more during the Phase 2, and at the end of the Phase 2 (after 12 months of flights have taken place at each facility). In addition to performance indicators, cost data can be collected at the same time (if possible and within recommendations from the evaluation team.)

Comparing supply chain costs relative to performance to determine cost-effectiveness

We hypothesize that supply chain performance will increase through implementing optimized direct deliveries via drone, versus supply chain performance via traditional modes of transportation. In order to make a fair cost comparison of the two delivery systems, *performance must be weighed relative to cost*. This seeks to make an “apples to apples” cost comparison rather than “apples to oranges”. To elaborate, the costs of the optimized drone delivery system may be significantly higher than the baseline costs of the current system, so we may need to compare costs to a **modeled optimized baseline** using traditional mode of transportation that yields the similar performance. VillageReach finds this to be a major limitation in prior cost evaluations that have been done on drones for medical commodity deliveries to date (*see the additional resources section*).

The methodology for the cost-effectiveness evaluation will be established with external evaluation consultants after the project design workshop in April 2020. Performance indicators may include: product availability, stockout rates, delivery time savings, on-time-in-full deliveries, vaccine utilization/ consumption, health worker efficiency, health worker time spent on logistics functions, satisfaction of health workers and data availability, etc. Using the outputs from this performance evaluation, we are interested in comparing the effectiveness of the transportation systems relative to the costs. As this intervention is only focused on augmenting the health supply chain for a limited period of time (via a new transportation methodology), long term health benefits (such as total lives saved or DALYs/QALYs) are not realistic measurement of effectiveness. We are interested in incorporating more short term, direct supply chain benefits that could be integrated into a cost-effectiveness analysis (listed above). The cost effectiveness analysis must be aligned with the performance evaluation methodology and will be agreed upon between all evaluating parties and VillageReach in June 2020, with baseline data collection expected to commence in ~July 2020.

VillageReach invites the firm to propose a **methodological approach to achieve this objective**. We understand that this methodology may not be fully informed as we await to finalize the project design, but please provide options with the information provided. We are happy to answer any additional questions needed in order to do this.

Financial recommendations for potential scale to a Phase 3

Finally, the third part of the assessment will draw on the outputs from both the costing exercise and the cost vs. performance comparison to develop financial recommendations for potential scale-up of in Phase 3. The outputs of these recommendations should be developed with VillageReach and the DRC MoH but may include: tangible budget figured MoH and partners to use to evaluate scaling up to more delivery sites and/or provinces, break-even point between cost, distance, payload and speed of execution, recommendations for the best example of a commercial model for scale up, minimum data requirements for future evaluations and cost data limitations, etc.

VillageReach invites the firm to propose a potential methodology for this part of the cost evaluation. We understand that this methodology may not be fully informed until you conduct more in-depth discussions with VillageReach, the drone company and the MoH. We are happy to answer additional questions.

For the above proposed evaluations, VillageReach will work closely with the evaluation team to determine the feasibility of the proposed methodologies relative to the DRC context. Additionally, the evaluation team can propose alternative methods for data collection and analysis.

VII. Location of Services

VillageReach seeks the services of an experience evaluator or evaluation firm to provide the associated services needed to conduct a cost and cost effectiveness evaluation in Equateur province, DRC. Proposed applications are not required to reside in or travel to DRC for this evaluation. If applicants do not reside in DRC, they must be able to advise the VillageReach evaluation team remotely. **The proposed evaluation is tentatively scheduled to be conducted between June 2020 and October/November 2021.**

VIII. Proposal Submission Instructions

A prospective vendor should prepare any offer simply and economically, giving a straightforward, concise picture of that vendor's ability to satisfy the requirements of the RFP. Expenses incurred in the preparation of the vendor's Information in response to this RFP are the vendor's sole responsibility.

Interested vendors are requested to submit an application, which includes a description of how the applicant will adhere to the above, as well as provide:

- Proposed evaluation methodology
- History of past work and references
- Key personnel to be assigned to this project and their CVs or qualifications
- Itemized budget for the work proposed. Please do not include physical data collection costs in the proposed budget. All cost incurred for physical data collection will be incurred by VillageReach.

- Any other information that responds to the requirements outlined in this RFP

Each prospective vendor shall include a statement in the documentation that the entire document (including scope and prices) contained therein are firm for not less than three months from the date of the quotation.

All submissions will be accepted electronically in advance of the date listed in the schedule of events at the following address:

Email: procurement@villagereach.org

IX. General Conditions

This RFP is not an offer to contract. The issuing of this RFP does not commit VillageReach to award a contract to any vendor, even if all requirements stated in this RFP are met, and will not limit our right to negotiate in our best interest.

This RFP will be sent to multiple vendors. VillageReach reserves the right to enter into separate contracts with multiple vendors if it desires to do so.

VillageReach shall not be responsible or liable in any manner for any risks, costs, or expenses incurred by any prospective vendor in responding to this RFP, including but not limited to the selected vendor(s).

X. Right of Rejection

VillageReach reserves the absolute right to reject any and all offers for any reason or for no reason whatsoever. We reserve the right to reject any response either completely or in any part. Without limiting the generality of the foregoing, VillageReach may reject any offer which fails to follow the RFP Information outline, which is submitted on forms that contain printed terms of stipulations, which is conditional, qualified or incomplete in any manner or which contains any irregularities of any kind.

XI. Right of Modification or Withdrawal

VillageReach reserves the absolute right to withdraw this RFP at any time or to modify this RFP by one or more addenda issued through the same methods as the original RFP release to whom VillageReach issued this RFP. VillageReach shall incur no liability whatsoever to prospective vendors by reason of such withdrawal or modifications.

We reserve the right at any time to discontinue the RFP process, and enter into discussions and/or negotiations with any one vendor if such action is in our best interest.

VillageReach reserves the right to modify any estimated requirements prior to signing the Agreements with the selected vendor(s). No prospective vendor shall have a claim on VillageReach in the event any estimated requirements are modified for whatever reason.

Any quantities of equipment or other information referenced herein are estimates and do not constitute a commitment.

XII. Confidentiality of Proposals

VillageReach routinely handles all information submitted in response to an RFP with care, uses it only for evaluation purposes, and restricts access to a minimum number of persons. VillageReach assumes no obligation and shall incur no liability regarding confidentiality of all or any portion of a quotation or any other material submitted in response to this RFP unless VillageReach has expressly agreed in writing to protect specifically identified information.

In the RFP Response, the responses must be clearly stated. The evaluation team will not search for answers and explanations.

XIII. Prerequisites for Doing Business

All vendors responding to this RFP must understand and accept the following VillageReach requirements:

Any vendor entering into a business partnership with VillageReach must:

- Be stable and financially healthy
- Have adequate personnel to provide responsive service and quality maintenance and support
- Provide adequate warranties or other legal recourse upon product or service failure
- Vendor payment will be linked to performance according to achievement of project milestones.

XIV. Additional Resources

VillageReach Publications

[Costing commodity delivery for obstetric emergencies in Malawi, VillageReach, 2019](#)

[Costs Associated with the Use of Unmanned Aerial Vehicles for Transportation of Laboratory Samples in Malawi, VillageReach, 2016.](#)

[The economic and operational value of using drones to transport vaccines, 2016.](#)

Other Publications

[Uncrewed aircraft systems versus motorcycles to deliver laboratory samples in west Africa: a comparative economic study, 2019.](#)