

EFFECTIVENESS OF DRONE TECHNOLOGY ON ACCESS TO BLOOD AND ITS PRODUCTS IN THE EASTERN REGION OF GHANA - A CROSS-SECTIONAL STUDY

MT72

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INTRODUCTION

The research addresses the challenge of inadequate blood supply, particularly in developing countries like Ghana, where blood demand exceeds availability. To tackle this issue, the government of Ghana has partnered with Zipline, an aerial logistics company, in 2019, to employ drone technology for blood delivery and other medical products. The study aims to evaluate the impact of this intervention in the Eastern region of Ghana. It also highlights the broader global context of blood shortages, the importance of voluntary donors, and the need for sustainable national blood systems, emphasizing the critical role of policies and legal instruments in ensuring safe and adequate blood supply.

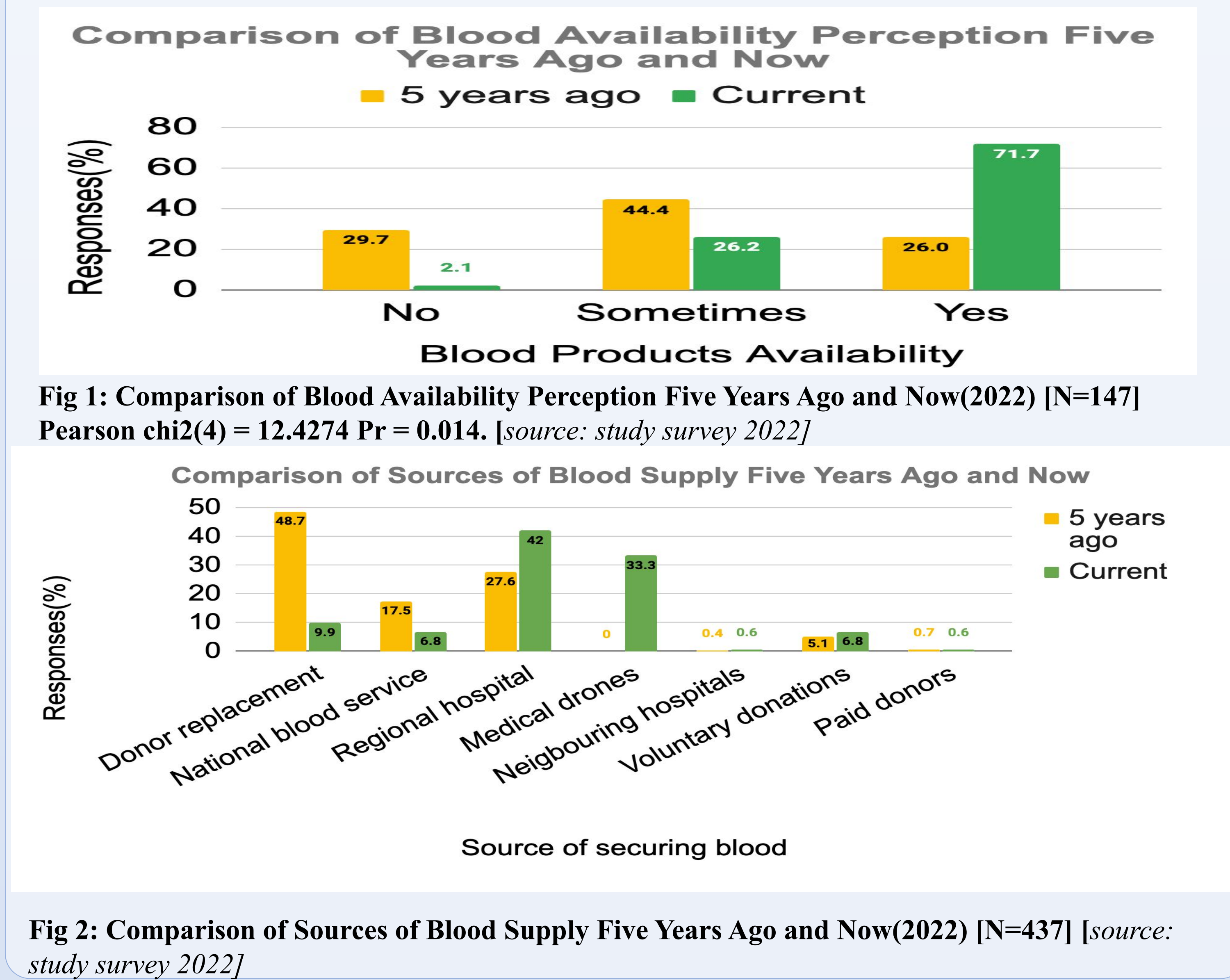
OBJECTIVES

- Specific Objectives
- To assess the role of aerial logistics (medical drones) in access to safe and sufficient quantity of blood products
  - To assess the clinical outcomes of on-time access to blood products for transfusion
  - To assess empowerment of service providers to provide blood transfusion services to the population

METHODOLOGY

Study Design	Sampling Method/ Data Collection	Inclusion and Exclusion Criteria	Data Analysis	Ethical Approval Number
Cross sectional	Secondary data were purposefully collected from 16 transfusion facilities in the Eastern region of Ghana, data on blood products delivered by the first drone distribution centre(DC) in the region	All Ghana Health Service transfusion facilities within the catchment of the first drone DC were included in the studies and non-transfusion facilities were excluded from the studies	Descriptive and inferential statistics were applied to the data set.	CHRPE/AP/72 0/22

RESULTS



Which of the following options provides you with fast, safe and reliable blood?

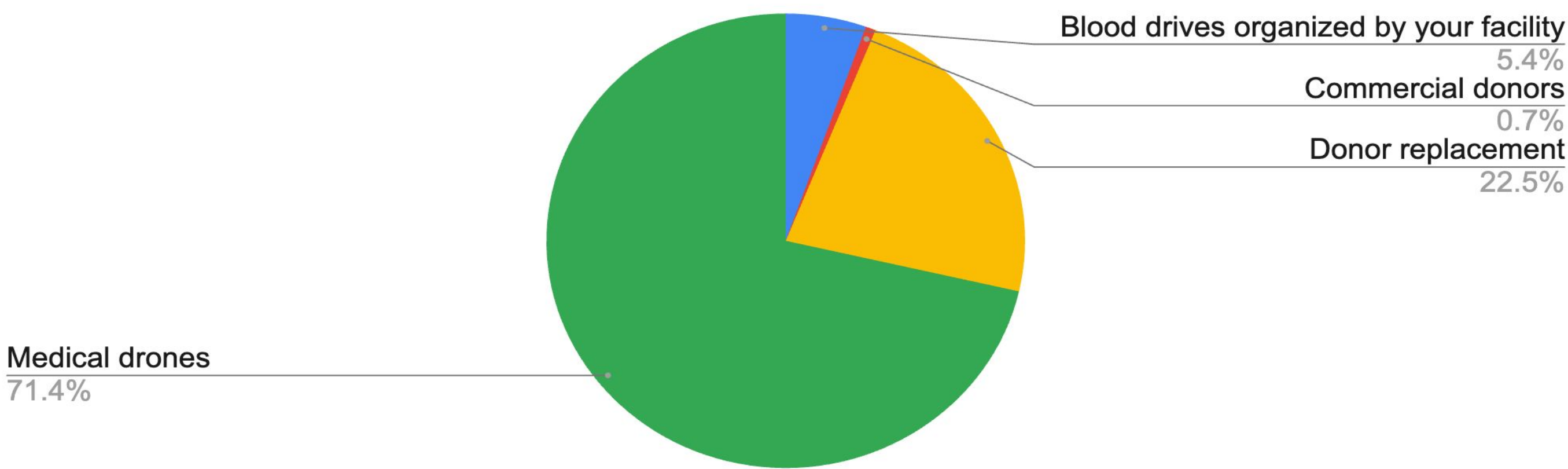


Fig 3: Proportion of blood sources that provide fast, safe and reliable blood products [N=149] [source: study survey 2022]

- The sources participants use to secure blood for transfusion services has expanded from the traditional sources to include neighbouring health facilities and medical drones. The latter saw an exponential usage after its implementation.(fig 1)
- A comparison between the responses for blood availability five years ago and now showed a significant difference with  $p < 0.05$  (fig 2)
- 71.4% mentioned that the medical drones provide them with fast, safe and reliable blood (fig 3)

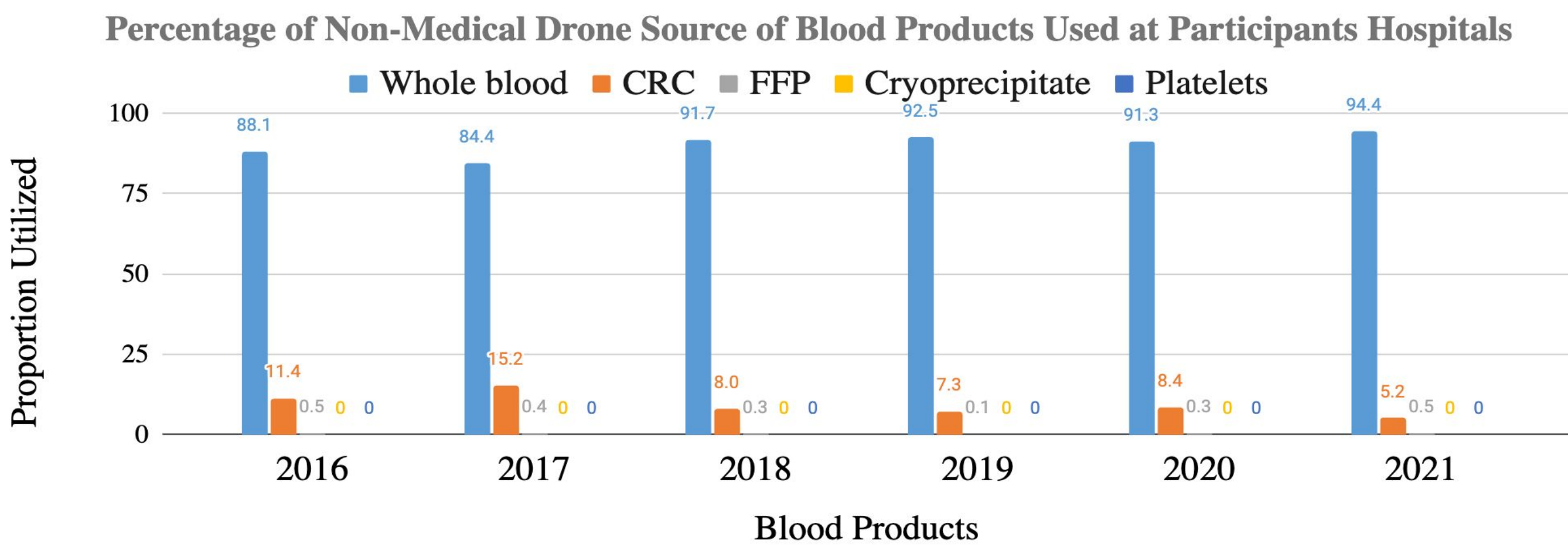


Figure 4: Proportion of blood products utilization from traditional sources [N=35466] [source: health facility laboratory record, 2022]

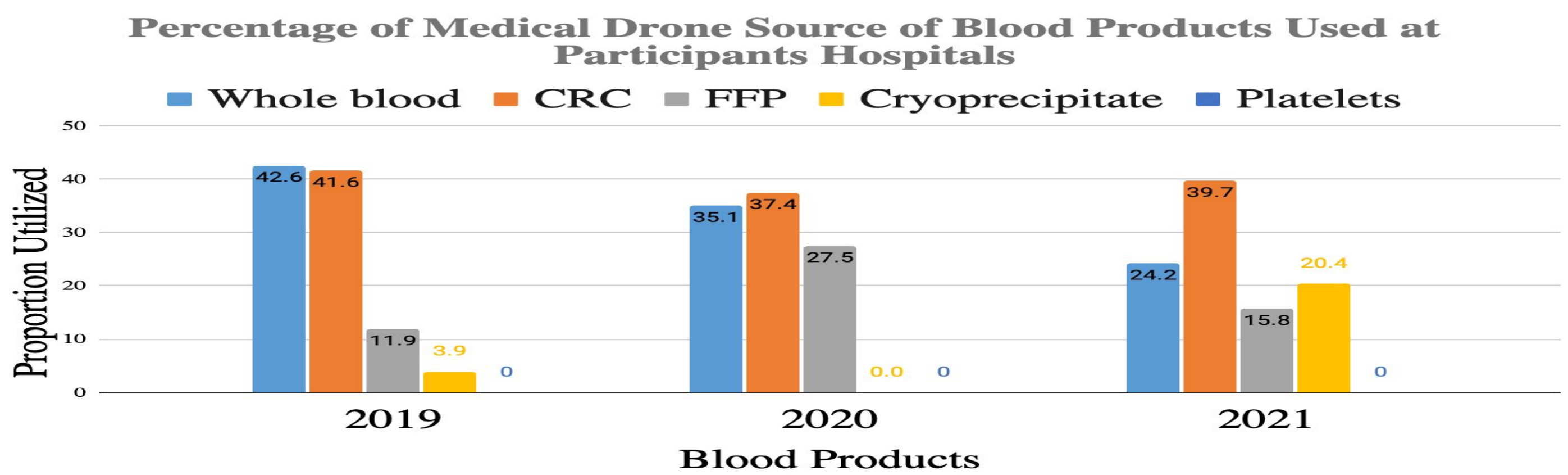


Figure 5: Proportion of blood utilization from medical drone delivery [N=1169] [source: medical drones delivery record, 2022]

Approximately 90% of the blood consumed from non-medical drone source were whole blood and less than 10% were CRC and FFP as shown in figure 4 while the proportion consumed from medical drone source were as follows; 34% whole blood, 40% CRC, 18% FFPs, and 8% Cryoprecipitate as shown by figure 5.

CONCLUSION

Medical drones offers fast, safe and reliable blood products, promoting the national blood policy on safety and quality to improve clinical outcomes of blood transfusion

The medical drones service offering fast, safe and reliable blood can be attributed to speedy autonomous robust drones, as well as the source of blood stocks (from the national blood service)

The medical drones have improved availability and access to blood products within the Eastern region

The drone technology has been effective in improving access and availability to blood products within the Eastern region

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Barro, L., Drew, V. J., Poda, G. G., Tagny, C. T., El-Ekiaby, M., Owusu-Ofori, S., & Burnouf, T. (2018). Blood transfusion in sub-Saharan Africa: understanding the missing gap and responding to present and future challenges. *Vox sanguinis*, 113(8), 726–736. <https://doi.org/10.1111/vox.12705>

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