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A STUDY OF MEDICAL EQUIPMENT DONATIONS: RECIPIENT EXPERIENCES

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INTRODUCTION

Poorly executed medical equipment donations create major problems for developing countries. In 2011, the World Health Organization (WHO) published a series of organizational guidelines for equipment procurement and donation [1]. However, recent studies suggest that equipment donation practices are sometimes generating little benefit to donation recipients [2-4].

The International Outreach Committee of the Canadian Medical and Biological Engineering Society (CMBES), in partnership with the Ghana Biomedical Engineering Association, conducted a study to better understand the medical equipment donation practices of Canadian organizations, and to share best practices to help improve donation effectiveness. We surveyed and interviewed Canadian donor organizations as well as Ghanaian health facilities that were the recipients of medical equipment donations. Findings from the survey of Canadian organizations have been previously reported [5-7]. In this paper we focus on the perspectives of recipient hospitals in Ghana.

METHODS

A survey tool consisting of thirty-five questions was developed to gather information from Ghanaian recipient hospitals about their experiences receiving medical equipment donations. Four questions collected information about the respondent. The remaining questions were a mix of multiple choice questions and open-ended long answer questions on topics such as: types of medical equipment received,

communication with the donor before and after the donation, discussion of equipment needs, level of support from donors in terms of provision of training, manuals and supplies, maintenance and availability of spare parts for donated equipment, logistics such as shipping and customs, and common challenges encountered with donations.

Twenty eight health facilities were visited across the country, and their survey responses were collated. A geographically representative sample of health facilities was chosen; at least two facilities were visited in each of Ghana's ten regions. We also sought to ensure that facilities receiving donations from Canadian organizations were well represented in the sample, and that a range of hospital types were chosen (government, teaching, mission, etc.). Survey questions were administered in person and on paper by a research assistant ("surveyor"); in some cases, the surveyor would wait on respondents to fill out the survey and in other cases the survey was administered as an interview and the surveyor filled in responses. Before conducting the survey, all respondents were given an introductory letter explaining the project.

A wide range of personnel within the health facilities were surveyed, but all had fair knowledge on medical equipment donations to the facility. Positions held by survey respondents included clinical engineers, hospital administrators, human resources, supply officers, nurses and clinical staff in charge of wards, equipment managers, medical directors, etc.

RESULTS AND DISCUSSION

A wide range of different equipment types have been donated to recipient facilities (**Figure 1**) below. Donated equipment ranges from consumables to life support equipment, with the greatest type of donations falling in the medical supplies category.

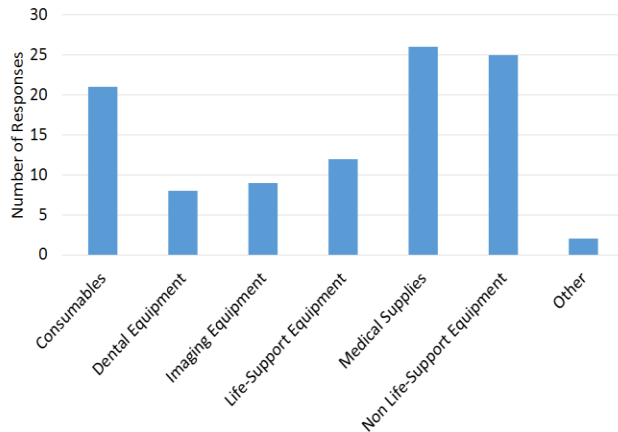


Figure 1: Distribution of types of donated equipment received - Facilities were asked to provide a selection of equipment classes normally received as donations.

An important element of the equipment donation process that we wanted to learn about was communication between donors and recipients, particularly when it came to the identification of equipment needs. When asked about the last donation received, 96% of respondents reported that there was communication with the donor agency before the donation was shipped, and 86% reported that the donor discussed their needs or asked what their greatest needs were in advance. Equipment needs were requested or identified in several different ways, either through a form or survey given by the donor (18%), a wishlist submitted in advance by the recipient hospital (18%), or just via direct communication between the donor and hospital administrators (11%). In a couple of cases (7%), the donor actually came to the hospital to discuss the needs of the hospital in person.

Two-way communication between the donor and recipient to identify needs prior to delivery is extremely important for a donation

to be effective. 7% of respondents added that this communication enabled them to make additional requests, some for very specific parts (e.g. fuses), allowing them to better operate medical devices they already had. The communication of equipment needs, however, did not always result in needs being met. One hospital mentioned that despite supplying a list of needed equipment, those items were not included in the shipment. 11% said they were not consulted at all about the equipment they needed, and one hospital commented that they had received a “surprise package”.

Upon receipt of donated medical equipment, most donor organizations provided on-site support (**Figure 2**). The types of support provided were installation, verification, user training and service training with service training being provided the least and verification being provided the most as evident (**Figure 2D** and **Figure 2B** respectively).

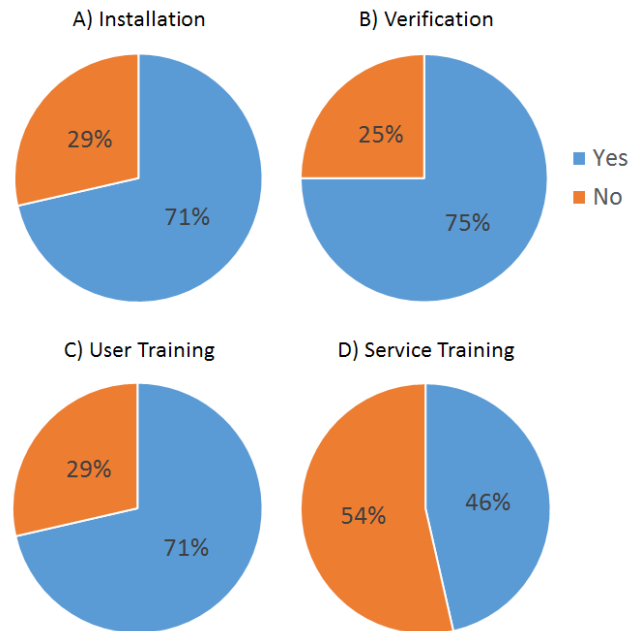


Figure 2: On-site support for donated equipment – Recipient facilities were asked if donor organizations provided A) installation assistance, and B) verification of functionality. They were also asked if donor organizations provided C) user training, and D) service training. Yes = blue, No = orange. Recipient responses are given as a percentage.

When asked about common problems encountered with medical equipment donations, the most common problem mentioned was a lack of spare parts (57%), followed by lack of operating and/or service manuals (32%) and issues with consumables, either lacking or expired (21%). Not one organization reported that they had received spare parts for every piece of donated equipment (**Figure 3**). In addition to the lack of spare parts, there was also a distinct lack of support material such as manuals and consumables provided by the donor organizations (**Figure 4**).

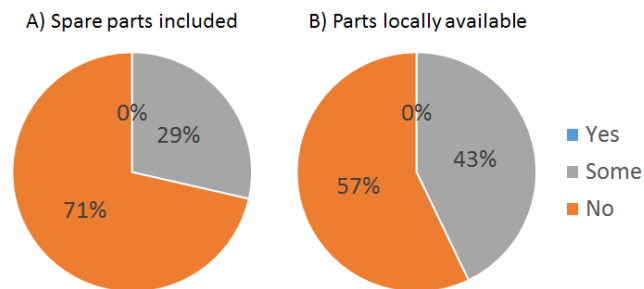


Figure 3: Spare parts inclusion – Recipients were asked if they received A) spare parts from the donor organizations, or B) were able to acquire spare parts locally. Yes = blue, Some = grey, No = orange. Recipient responses are given as a percentage.

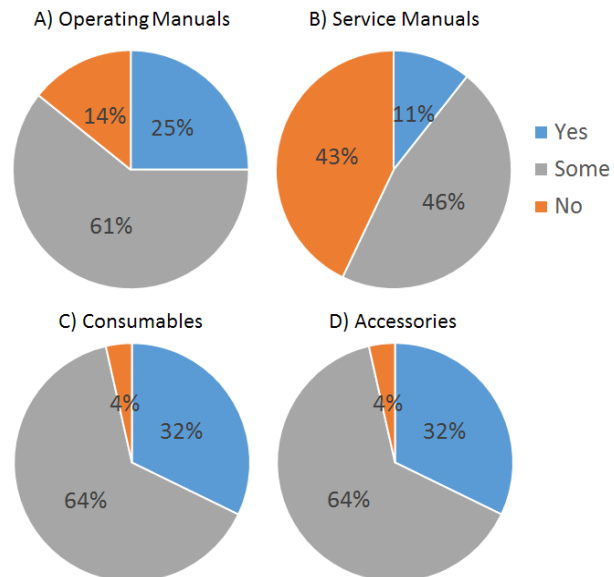


Figure 4: Support materials for donated equipment – Recipient facilities were asked if the donated equipment included A) operating manuals, B) service manuals, C) consumables, and D) accessories. Yes = blue, Some = grey, No = orange. Recipient responses are given as a percentage.

Other common problems encountered included: power issues (e.g., the equipment was meant for the wrong voltage, or was too sensitive to power fluctuations), the equipment arrived faulty, or the equipment was not durable or appropriate for the setting (e.g., the climatic conditions influenced the functioning of some equipment).

Recipients were also asked to describe in their own words what they thought could be done to improve the effectiveness of medical equipment donations to Ghana. The following are some illuminating responses:

- "Thorough needs assessments of beneficiary facilities should be done. Equipment donated must meet these needs."
- "All donations must go with initial user trainings and monitoring by the donors as to the functionality of the equipment."
- "Should make available consumables and if possible link users to sources of this items they can be procured by users when it's finished."

- "Tax exemptions on these equipment. Removal of bureaucratic barriers."

Despite the challenges and common problems encountered, when asked whether donated medical equipment benefited their organization 100% responded positively. Donated electronic medical equipment allowed greater efficiency and accuracy for diagnosis, therefore reducing the burden and load on the nurses and staff, and allowing for better quality of care. 48% of respondents answered that donated equipment helped in cost reduction, with 51% stating that donated supplies either reduced the burden on health care providers or helped with patient management. Furthermore, one of the facilities noted that medical equipment allowed for reduction in premature fetal mortality rates.

SUMMARY AND CONCLUSIONS

In summary, the major challenges reported by donation recipients in Ghana included: a general lack of service training for technical staff, poor communication, and a lack of spare parts to maintain the donated equipment. Despite these concerns, in general, recipients felt that donated medical equipment benefits their facility in diverse ways: e.g., facilitating service delivery to clients/patients, reducing workload, more accurate diagnostic information, and improved productivity of health workers.

Any donation initiative should be part of an on-going partnership consisting of three core elements: consultation; planning and process; and follow-up and monitoring. In an effort to bridge the gap and improve the effectiveness, between donations practices and recipient needs, the CMBES has created a video to help disseminate these best practices [8].

REFERENCES

[1] "Medical device donations: considerations for solicitation and provision. (WHO Medical device technical series)," World Health Organization, Geneva, 2011. Accessed: Feb. 29, 2016. Available at: <http://apps.who.int/medicinedocs/en/d/Js21561en/>.

[2] F. Zomboko, S. Tripathi, F. K. Kamuzora, "Challenges in Procurement and Use of Donated Medical Equipment: Study of a Selected Referral Hospital in Tanzania," *International Refereed Research Journal*, Vol. 3, pp.41- 48, October 2012.

[3] S.R. Howie, S.E Hill, D.Peel, et al., "Beyond good intentions: lessons on equipment donation from an African hospital," *Bull WHO*, Vol. 86, pp.52-56, 2008.

[4] L. Perry and R. Malkin, "Effectiveness of medical equipment donations to improve health systems: how much medical equipment is broken in the developing world?" *Med Biol Eng Comput*, Vol.49, pp.719-722, 2011.

[5] S. Mirzazadeh, B. Bradley, B. Gentles, Y-L. Cheng, "Improving the effectiveness of medical equipment donations from Canada to developing countries: A survey." Proceedings of the 2014 Canadian Medical and Biological Engineering Society Conference (CMBEC37). Vancouver, Canada: 21-23 May 2014.

[6] N. Adjabu, B. Bradley, B.I Gentles, C. Mirzazadeh, "A study of medical equipment donations from Canada to developing countries: progress and challenges." Proceedings of the 2014 Appropriate Healthcare Technologies for Low Resource Settings Conference (AHT 2014). London, UK: 17-18 Sept 2014.

[7] B. Gentles, B. Bradley, S. Mirzazadeh, "A Study of the Challenges of Donating Medical Equipment to Developing Countries." Presentation at the World Congress on Medical Physics and Biomedical Engineering (IUPESM2015), Toronto, Canada: June 2015.

[8] "Donations - Understanding Challenges & Best Practices." Canadian Medical and Biological Engineering Society (CMBES). Available at: <https://www.youtube.com/watch?v=R27CPPAwL1Y>. Toronto, Canada: Oct 2015.