

Accepted Manuscript

Location of low-cost blood collection and distribution centres in Thailand

Pornpimol Chaiwuttisak, Honora Smith, Yue Wu, Chris Potts, Tasanee Sakuldamrongpanich, Somchai Pathomsiri

PII: S2211-6923(14)20042-7

DOI: <http://dx.doi.org/10.1016/j.orhc.2016.02.001>

Reference: ORHC 99

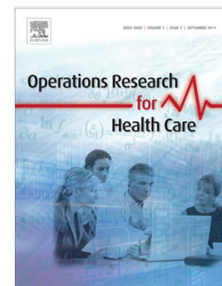
To appear in: *Operations Research for Health Care*

Received date: 17 October 2014

Accepted date: 26 February 2016

Please cite this article as: P. Chaiwuttisak, H. Smith, Y. Wu, C. Potts, T. Sakuldamrongpanich, S. Pathomsiri, Location of low-cost blood collection and distribution centres in Thailand, *Operations Research for Health Care* (2016), <http://dx.doi.org/10.1016/j.orhc.2016.02.001>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Location of low-cost blood collection and distribution centres in Thailand

Pornpimol Chaiwuttisak^{a,*}, Honora Smith^a, Yue Wu^a, Chris Potts^a, Tasanee Sakuldamrongpanich^b, Somchai Pathomsiri^c

^a CORMSIS, University of Southampton, Highfield, Southampton, SO17 1BJ, UK

^b National Blood Centre, the Thai Red Cross Society, Bangkok, Thailand

^c Civil and Environmental Engineering department, Mahidol University, Thailand

Abstract

Decision making on facility locations for blood services has an impact on the efficiency of supply chain and logistics systems. In the blood supply chain operated by the Thai Red Cross Society (TRCS), problems are faced with amounts of blood collected in different provinces of Thailand being insufficient to meet demand. At the present time, TRCS operates one National Blood Centre in the capital and twelve Regional Blood Centres in different provinces to collect, prepare, test, and distribute safe blood. A proposal has been made to extend this network of blood centres using low-cost collection and distribution centres. Increasing numbers of fixed collection sites can improve access for donors. In addition, some facilities will be able to perform preparation and storage for blood that hospitals can receive directly. This paper addresses the selection of sites for two types of facility, either a blood donation room only or donation room with a distribution centre. A range of investment budgets is investigated to inform the strategic plan of this non-profit organisation. We present a novel binary integer programming model for this location-allocation problem based on objectives of improving the supply of blood products while reducing costs of transportation. Computational results are reported, using real life data, that are of practical importance to decision makers.

© 2014 Published by Elsevier Ltd.

Keywords: Blood supply chain, Location analysis, Developing countries

1. Introduction

The locations of suppliers, processing plants and distribution centres are critical to the efficient running of any supply chain network: this is especially important when transporting perishable products such as blood. Moreover, the essential nature of the blood supply chain in delivering blood products to hospitals brings special problems in developing countries, such as Thailand where budgets are limited. This paper introduces a new location-allocation model for the siting of low-cost blood collection and distribution centres that are planned to provide an extended service to an existing network of regional blood centres in Thailand.

* Corresponding author.

Email address: molchaiwuttisak@outlook.com (Pornpimol Chaiwuttisak)

Download English Version:

<https://daneshyari.com/en/article/7543601>

Download Persian Version:

<https://daneshyari.com/article/7543601>

[Daneshyari.com](https://daneshyari.com)