How does consolidation of blood production and distribution services impact hospitals?

What is this research about?
Canadian Blood Services is a not-for-profit organization whose mission is to manage the supply of blood and blood products in Canada, except for the Province of Québec. The majority of Canadian Blood Services activities relate to collection, production, testing, and distribution of transfusable products (red blood cells, plasma, and platelets). In recent years, to optimize its operations, Canadian Blood Services has looked at consolidating a number of its blood production and testing centres. This consolidation plan necessitates changes in the transportation network between production facilities and hospitals which need reliable access to blood products. The purpose of this research was to evaluate the new consolidation plan for the Maritimes (consisting of the Provinces of Nova Scotia (NS), New Brunswick (NB), and Prince Edward Island) with respect to product availability for hospitals. Weather, particularly in winter, was thought might interfere with deliveries and negatively impact the availability of blood for NB hospitals.

What did the researchers do?
In the Maritimes, the consolidation plan was to relocate production/distribution facilities from Saint John (NB) and Halifax (NS) to a single site in Dartmouth (NS) and to have a stock-holding facility in Saint John (NB). Because services within NS will be unaffected by the consolidation plan, the researchers did experiments to evaluate and compare expected service levels only for hospitals within NB supported through Saint John under the “current” and “to be” distribution network. One analysis focused on a physical test of the proposed air delivery system to hospitals located in northern NB. The physical test ran in 2011 and involved a comparison of 700 bus shipments, 400 air shipments, and 500 courier deliveries. A second analysis used computer simulation models to evaluate service levels for hospitals in the south of NB which will be supplied by a dedicated Canadian Blood Services ground run. The simulation included three models to look at different logistics arrangements and to determine the amount of inventory necessary at a Saint John stock-holding unit to accommodate disruptions caused by weather or other factors.

What did the researchers find?

- Results indicate that simulation can be used to represent blood supply chain operation in the Maritime region.

- Both the physical test and the simulation models show that product availability for the hospitals in NB will not be adversely affected by the plan to consolidate production facilities in Dartmouth.

How can you use this research?
Weather will always impact the blood transport network. However, this study shows that by careful inventory, contingency, and operational planning, these impacts can be minimized. Blood operators can use this...
research to make decisions when developing new operational strategies that may affect their distribution network. Hospitals can use this research to assess the impact of changes to production and distribution methods for blood products in their region.

About the research team: Dr John Blake is an Engineer at Canadian Blood Services and an Associate Professor in the Department of Industrial Engineering at Dalhousie University. His research interest is in the application of Operational Research techniques to health care problems. Mathew Hardy is a MASc student with Dr Blake and a Canadian Blood Services technician. Dorothy Harris is a medical laboratory technologist with 31 year experience in transfusion medicine and is the Canadian Blood Services’ hospital liaison specialist in Atlantic Canada. Michelle Rogerson is trained as a medical laboratory technologist and is the Canadian Blood Services’ Director of Product & Hospital Services and oversees national production planning and inventory management. Gail Samaan is a medical laboratory technologist with 36 year experience in hematology and transfusion medicine and is the Manager of Production for Canadian Blood Services in New Brunswick.

This Research Unit is derived from the following publications:


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