Mathematical Model of Blood Collection Routing Problem

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Abstrak

ABSTRAK
The scarcity of blood that is still happening today is the result of a combination of high blood needs and the difficulty of recruiting and maintaining donors. There is no research discover the substitute that can replace the role of blood, therefore the only source is from donations or blood donors. Approximately 80% of total blood donations collected by American Red Cross are come from blood drive events. Because blood has 6-hour spoilage time, donated blood at various donation locations must be collected and sent to a blood center for processing in less than 6 hours. This research study the Maximum Blood Collection Routing Problem (MBCRP). This problem is the extension of Vehicle Routing Problem with Time-Window (VRPTW) by considering the spoilage time limitation in blood. A mathematical model with objective to maximize total blood collection is built to cope with this problem. The mathematical model will be tested for verification and validation. The model is written in a computer programming language using AMPL software and is solved using the CPLEX solver. Furthermore, the results of verification and validation tests will be evaluated to see the applicability of the model.