

Yugoslav Journal of Operations Research  
xx (2017), Number nn, zzz-zzz  
DOI: 10.2298/YJOR160617022G

ISSN: 0354-0243

EISSN: 2334-6043. (UGC APPROVED)

## INVENTORY AND TRANSPORTATION COST MINIMIZATION IN THE DELIVERY LOGISTICS OF SWINE FLU VACCINE

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Received: June 2016 / Accepted: November 2016

**Abstract:** In this paper, we present a mathematical model of delivery logistics of swine flu vaccine in a rural area. The objective is to make the medicine available at the Primary health centres of that area in such a way that the total cost (purchasing and cartage) of obtaining the flu vaccination is minimized and the demand of the demand centres is met. One more constraint is taken into consideration: once the bottle of the medicine is opened, it has to be given to a fixed number of patients requiring swine flu vaccine simultaneously failing which the proportion of unused medicine become obsolete and can not be administered to the patients. But if the bottle of medicine could not be used fully at a time then, the unused medicine can be sold back at a discounted price. Under such conditions, our next objective is to determine the size of order that must be placed so that the expected total profit per year is maximized. The methodology to achieve this objective is: first, formulate the problem as a fixed charge capacitated transportation model with bounds on rim conditions to determine the number of units that should be purchased from various distribution centres such that the total cost (purchasing cost + cartage) of obtaining the medicine is minimized. Further, model the problem as an inventory model to determine the size of order.

**Keywords:** Logistics, capacitated, transportation problem, inventory, fixed charge.

**MSC:** 90C08, 90B06.

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ISSN: 0354-0243 EISSN: 2334-6043

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