Perinatal Assistance Network Planning Via Simulation

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Consider a geographical region where population is distributed in health districts. In the same region there exists a three-tiered neonatal care network, which includes birth centres for supplying respectively basic assistance, mild pathology care and neonatal intensive care. Each mother-to-be is admitted to a facility serving the level corresponding to the expected newborn conditions; newborn transfers from a lower to a higher-level facility are effected if the newborn conditions worsen. Each district has a known probabilistically distributed demand for each of the three perinatal care levels previously mentioned and each facility is characterized by a capacity, i.e., the amount of patients who can be simultaneously admitted there. A discrete stochastic simulation model describing mothers and newborns movements from districts to birth centres and among centres has been built up, with the aim of revealing lacks and inadequacies in the assistance network and of obtaining useful suggestions about suitable network resizing in order to improve service quality and reduce trouble due to distance. The model has been implemented in MicroSaint Student on a personal computer and applied to Veneto region in North-East Italy but its use may be extended to other similar situations.