Exploring a Spatial Interaction Model for Paediatric Health Facilities

Scenario:

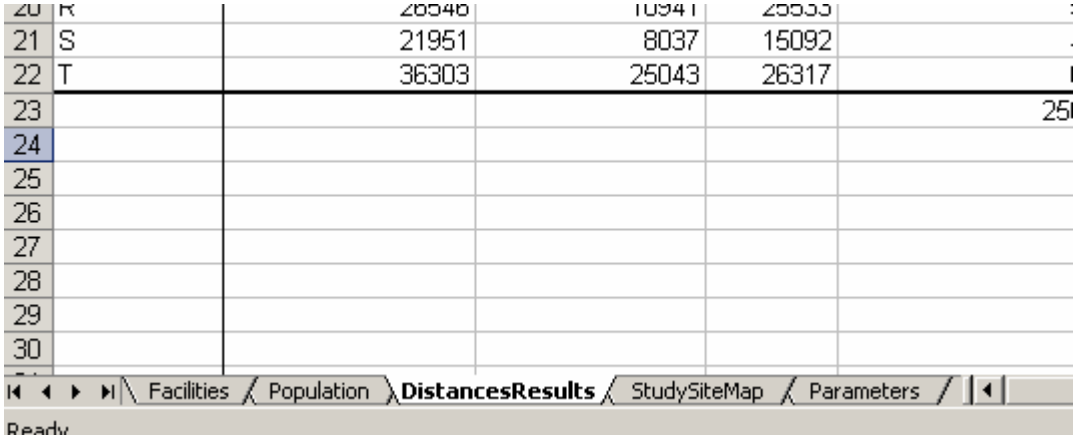
A fictitious region is wishing to expand its paediatric healthcare facilities. At present, there is a specialist, central paediatric unit which offers a wide range of services and a smaller, community-based unit with a more limited range of services.

A simple, spatial interaction model has been developed to help with this problem, which makes use of population data for census tracts in the surrounding area, details of the three facilities, and the distances between facilities and the population.

Your task is to use the spatial interaction model to help identify the most suitable location for the new paediatric centre.

The Model and Data:

The spreadsheet containing the model consists of several worksheets, which you can move between by clicking on the tabs at the foot of the spreadsheet:



The worksheets are as follows:

- **facilities** – this has details of the three different paediatric facilities within the region – the central unit, the community hospital, and the proposed new unit.
- **Population** – this contains the centroids (centre points) of 20 census tracts, together with the number of children under 5 years resident in each tract.
- **StudySiteMap** – this contains a simple map of the study site.
- **Parameters** – this worksheet contains the three parameters that the model is based on.

- **DistanceResults** – this worksheet contains the straight-line (Euclidean) distances between each census tract centroid and the three health facilities. This worksheet also contains the model results in columns E to H. These results are the number of predicted trips per year by children to each of the three health facilities.

Instructions:

- Have a quick look at the study site map and the worksheets of health facility and population characteristics.
- Try changing the location of the proposed new facility, by changing the numbers in the yellow cells in the 'facilities' worksheet. See if you can find a location which maximises the number of trips made to this new facility.
- Try changing the value of the 'friction of distance' parameter (and the other parameters too if you wish) in the 'parameters' worksheet. How does this affect the pattern of trips made in the 'DistanceResults' worksheet?