Reviewer's report

Title: Methodological Aspects of a GIS-based Environmental Health Inspection Program used in the Athens 2004 Olympic and Para Olympic Games

Version: 2 Date: 31 March 2005

Reviewer: Maged Nabih Kamel Boulos

Reviewer's report:

It is obvious that quite a bit of work went into the exercise described in this paper, which is a real one executed in preparation for the Athens 2004 Olympic and Para Olympic games. The topic is interesting, but quite traditional—nothing really novel here. However, it is worth publishing (after substantial revision) because of the importance of the exercise settings—Olympic games and similar mass gatherings.

The current manuscript draft needs to be more clearly written so that it is informative to the reader. This is especially important since this is a methods paper (the authors are focusing on the “methodological aspects” of their exercise). Some key citations on related work (about a system used in the 2002 Olympic Winter Games in Salt Lake City, USA) are missing and should be included in the revised manuscript. Also, better maps (figures) should be submitted, as the current ones have many problems and are not suitable for publication.

Specific Comments/ Major Compulsory Revisions

1. In several places throughout the manuscript, in the abstract (under Methods and Results) and on pages 6, 8 and 10, we are told about "a needs assessment survey using several questionnaires", "Nineteen standardized questionnaires", "standardized questionnaires used during on-site visits", "standardized checklists and sampling forms", "Nineteen checklists", and "several reporting forms". The terminology used (questionnaires, standardized questionnaires, checklists, standardized checklists, sampling forms, reporting forms) and the figure of 19 (used for standardized questionnaires and checklists) leave the reader confused about the nature and purpose of these data collection instruments and whether they are all the same or different. It would be helpful if the authors could revise their terminology and provide more details about their data collection instruments. Also, any questionnaires/checklists/forms used could be submitted as additional information to be published with the paper (BMC submission system allows additional information files to be uploaded using the 'Additional Material files' button in the manuscript submission process “check 'Instructions for Authors').

2. Standard GIS terminology should be used for the GIS functions described in this paper. For example, "a circular range of 1,000, 500 and 300 meters" (page 9 and also Figure 2) should be described as "buffers". The GIS process of buffering (building zones “buffers or corridors” around features) is a very useful and standard GIS function. The user enters the desired buffering distance, and then the GIS builds the buffer outward from the selected feature or features.

3. Methods: The authors mention "algorithms" used to estimate the workload of each county and to partition counties into sections with equal workloads. The actual "algorithms"/software functions used remain very vague to this reviewer. Some parameters have been estimated, e.g., inspectors driving at about 10 Km/h, but no calculation details/justifications have been given for those estimates, and there is no mentioning of how exactly they have been incorporated into the "algorithms". How distances were measured? Were factors like traffic congestion/bottlenecks, one-way streets, and no-parking zones taken into account, and how? Page 14 mentions
"unpredictable factors" and no attempt has been made to even qualify those factors/provide some possible examples (although the authors are rightly acknowledging these "unpredictable factors" as one of the limitations of their study).

This reviewer was expecting to read about some standard GIS network analysis/routing functions when those "algorithms" were mentioned. Such functions can consider many of the above mentioned attributes in the search for optimized inspection routes/equal workload partitions, such as one-way streets, rate of travel (speed limit/traffic condition), road type and condition, or other barriers that prevent continued movement. A related GIS feature, the isochrone function, allows us, departing from some starting location, to identify all geographically reachable areas and routes in all directions based on some user-defined criteria, e.g., after traveling less than 10 km, or less than 10 min. There are numerous health/healthcare applications for this type of topological operations, such as emergency response routing. ESRI ArcView/ArcGIS Network Analyst extension allows such functions, provided suitable base street network data are available (for MapInfo, the tool is known as Drivetime).

4. Abstract (page 2): "several applications have already been reported in the literature"
Consider revising this sentence. There are many GIS applications reported in the literature rather than several. The following two reviews can be used as a proxy to the large number of GIS applications that have been described in the biomedical/public health literature:
http://www.soi.city.ac.uk/~dk708/JBl1015a.pdf

5. Abstract (page 2) and Discussion section (pages 12 onward): "there are no reports for the use of GIS in previous Olympic Games"
This is not an accurate statement. In fact, GIS formed a very important component of RODS, the Realtime Outbreak and Disease Surveillance system that was used in the 2002 Olympic Winter Games in Salt Lake City, USA. More information about RODS can be found in the following two references:

6. Page 10: "Using databases from Epi Info 2002" â€“ Please provide more details about the nature/origin/content of those databases. Also, please mention the publisher/URL of Epi Info (CDC - http://www.cdc.gov/epiinfo/).

7. Page 10: "Using databases from Epi info 2002 and its GIS component (â€¢) we were able to display the inspection results in color codes according to the categorical score received by each premise" â€“ This could have also been done in ArcView 3.2 (which you have also used in your exercise â€“ page 7). Please explain/provide details of why you have used Epi Map instead.

8. Discussion â€“ page 13: This is not really a discussion of the authors' results. It is an incomplete literature review of the potential benefits and applications of GIS (references 7-15). This part of the discussion should be moved to the Background/Introduction sections of the manuscript. The authors should instead discuss the other potential uses of GIS during such large events like the Olympic
games, e.g., in emergency preparedness and for managing, dispatching and routing ambulance vehicles. The GIS component of the RODS system that was used in the 2002 Olympic Winter Games in Salt Lake City, USA (see references above) should also be discussed here as another example of GIS applications that could be helpful in Olympic games and similar mass gathering events.

9. Figures are of a very low resolution and the font size used for map legends is too small/looks unprofessional. Figure 1 shows an unexplained red circle near the centre. The maps also offer too much detail (resulting in confluent map features), and since they are not interactive/zoomable maps (as they were in their native GIS application from which the static figures have been generated), it is recommended that the authors zoom in to some representative areas on these maps and use those areas as their paper figures to clearly demonstrate what they have done (they can also use those 'zoom in' areas as map insets). Colour-blind-friendly schemes are also recommended (especially for Figure 3 â€“ the light green colour). Please revise the map colours so that they are consistent with Cynthia Brewer's recommendations (see: http://www.colorbrewer.org/). Vischeck (http://www.vischeck.com/) can be used to test the new figures prior to resubmission (see screensho on next page).

Current Figure 3 in Vischeck. Note how the corresponding "light green" dots in the deuteranope version cannot be easily distinguished from the street network background.

10. There are also some typos/language errors, though overall, the writing of the manuscript is acceptable. For example, page 8: "the best premises with respect to public health risks" (rephrase to something like "premises posing the lowest public health risks"), page 10: "using a several reporting forms", page 12: "automatically" (double 'a' at the beginning of 'automatically'), page 14: "has proven its value whenever was tested", etc.

Minor Comment

1. Introduction (page 5 â€“ last para) and literature review: It is always desirable to use/relate to the traditional classification of GIS services, which comprises two broad types of GIS applications that also reflect the two traditions in health geography (geography of disease and geography of healthcare systems). These two application types are health outcomes and epidemiology applications, and healthcare delivery applications. The latter type includes the health service and resource allocation/management applications of GIS. There are also studies at the interface (overlap) between epidemiological and healthcare delivery applications, for example in relation to healthcare commissioning and needs assessment. See: Boulos MN, Roudsari AV, Carson ER. Health geomatics: an enabling suite of technologies in health and healthcare. J Biomed Inform. 2001 Jun;34(3):195-219. http://www.soi.city.ac.uk/~dk708/JBI1015a.pdf

Statistical review: No
I declare that I have no competing interests

--Maged N.K. Boulos
31 March 2005

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article whose findings are important to those with closely related research interests
Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

I declare that I have no competing interests