

**Environmental Change and Infectious Disease
Transmission**

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Geographic Information Systems:

Applications to Infectious Disease Research and Reduction

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Technical issues in deciding on a GIS

- A. Spatial scale to be studied
- B. Resolution of spatial data sought
- C. Software/hardware needs
- D. Costs vs. benefits

Technical issues in evaluating remote sensing needs

- A. Environmental measures being sought
- B. Relevant details of transmission system
- C. Spatial variation in environment
- D. Goals of RS data use: description, prediction and intervention
- E. Costs vs. benefits

Have we advanced the science to address Migration, Urbanization and Health?

Some Impressions:

- RS/GIS applications have characterized time-space patterns of population and land-use. Challenge: can we better use these data to uncover underlying processes?
- Most of our discussion focused on the technology of data gathering and display, rather than its application to problem solving. (Need is considerable, especially in underdeveloped countries.) But, limited use of RS/GIS in ANALYSIS of Migration, Urbanization and Health.

Can the science be used to influence policy?

- Maps and images useful to impress policy makers of importance of problems. (But we don't need GIS to make maps.)

Can these tools be used to better understand what actions are recommended?

- Most modeling has characterized past time-space patterns of migration and disease, e.g.
 - human pop. density and epidemic patterns (Cliff)
 - deforestation, migration and malaria (de Castro)
 - maps of mosquitoes, maize, and malaria (Spielman)
 - various examples (Kitron)
 - etc.

Can these patterns be used to anticipate (forecast?) future risk, and hence affect prevention policy. Will policymakers believe it?

Science to policy? - cont.

- **Application of RS/GIS to land use planning needs seems obvious.**

Does this imply adequate understanding of how human health will be affected?

- **Technological solutions to WHICH problems?**

How will finer spatial and spectral resolution, for example, improve analyses of health risk and intervention policy?

Science to policy? - Some questions

- **Do we understand more about disease dynamics from spatial analyses and if so how does this translate to practice?**
- **How do we balance focus on Policy issues of RS/GIS data versus on the role of RS/GIS data in affecting Health Policy?**
- **Do visualizations provide policy-related "value added" that goes beyond what is often already known?**
- **Should we be concerned that many efforts tend to be Method- or Data-driven rather than Problem-driven?**
- **How do we address the challenges of capacity building in developing countries where the health problems are the greatest?**