Say Yes to GIS
Spatial Analysis in a Health and Inequality Curriculum

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Agenda

What does spatial analysis add to the study of Health Inequalities? How can it be integrated into a health studies curriculum?

Why choose ArcGIS as our spatial analysis tool? What are some logistical issues to consider?

What are the basics of teaching ArcGIS in this context?

What was the result (successes and challenges)?
Epidemiology: a branch of medical science that deals with the incidence, distribution, and control of disease in a population.

Social Epidemiology: the subfield of epidemiology that investigates the social determinants of health, or how social conditions and inequities “get under the skin” to create unequal patterns of disease in a population.
Why use a spatial analysis tool to teach a course on inequities in health?
Spatial Analysis & Epidemiology
Tailoring the curriculum

Preparatory class assignments (lit reviews on particular variables; requires familiarity with available data)

Place specific (Philadelphia)

Getting into the community (Route 23 bus, Field Trips to local org)

Guest speakers (Jake Blumgart, WHYY)

Lab time (6 sessions)

“Disease Detective” Term Projects: Students will be assigned to groups analyzing patterns in the distribution of a particular health conditions in Philadelphia. Students will have an opportunity to rank their preferences among the following topics: opioid-related fatalities, gun violence, obesity, diabetes, low birth-weight, and HIV/AIDS. Projects will contain both individual and group assignments.

Lit Reviews & Theoretical Models (2): Due Feb 23rd & April 6th by 11:59 pm Students will research and produce literature reviews of two social variables in relation to their health condition. The first literature review will be based on a variable selected among those covered in the syllabus, including income, education, poverty, employment, race or ethnicity, gender, sexuality, social capital. The second literature review will be based on a variable chosen by the student, informed by their prior research. Each review will be 4 - 6 pages, double spaced, 12-point font, 1 inch margins, and include at least six (6) peer-reviewed sources, cited in APA style. Students will also create a theoretical model to accompany each lit review. The model will indicate the full causal chain that links the social variable to your health outcome and should fit on a single page or power-point slide.

GIS maps (2): Due April, 24th by 11:59 pm Students create two GIS maps that visually demonstrate the relationship between selected social variables and assigned health state.

GROUP Project: Due April, 24th by 11:59 pm 1. Comprehensive Theoretical Model: Based on a synthesis of each individual’s work, groups will create a comprehensive theoretical model in Philadelphia that includes all group variables. 2. Theory of change: Field Trips will be scheduled for each group to visit a local intervention addressing their issue. Using the field trip/intervention as a case study, generate a diagram representing your theory of change. The theory of change should fit on a single page or power-point slide. 3. Group Presentations: Each group will give a 20-minute presentation of their findings, upload talking points to Moodle, and be asked to field audience questions.
Picking a GIS Tool

ArcGIS Online
Easy to use
Data rich
Accessible

No special equipment, beyond laptops
Account management and other backend issues
Created accounts

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Subscription Status:
- 54,767 credits remaining
- Expires: 07/11/2018
- ID: 7279052743
- Feature Data Store: Standard
- Members per level:
  - 0 of 0
  - 79 of 100
Created groups
Teaching GIS
Unique capabilities of GIS:

- GIS stores related geographic features in separate collections of files called map layers.
- Map layers can be reused easily, assembled into any number of map compositions, and overlaid for analysis.
GIS answers the following:

Location: What is at ...? Where is it?
Condition: What is a feature’s status?
Trends: What has changed since ...?
Patterns: What spatial patterns exist?
Modeling: What if ...?
GIS learning goals:

1. Spatial thinking
2. Finding and adding geographic data
3. Analyzing data spatially
4. Representing data

Labs:
6 sessions - 90 minutes each
Instructional Use of GIS

Lab 1
Spatial problem solving approach:

1. Ask and explore
2. Model and compute
3. Examine and interpret
4. Make decisions
5. Share your results

Lab 1

Instructional Use of GIS

- Level 1: Presentation or demo
- Level 2
- Level 3
- Level 4
- Level 5

Custom project
Directed project
Expanded script
Scripted activity
Instructional Use of GIS

Labs 2 & 3
Lab 4

Instructional Use of GIS

- Level 1: Presentation or demo
- Level 2: Scripted activity
- Level 3: Expanded script
- Level 4: Directed project
- Level 5: Custom project
Labs 5 & 6

Instructional Use of GIS

- Level 1: Presentation or demo
- Level 2: Scripted activity
- Level 3: Expanded script
- Level 4: Directed project
- Level 5: Custom project
Student Projects and Experiences
Successes and Challenges

Evaluations highly positive

practical skill, creativity, group synergy, class synergy, excellent demonstration of course themes

Challenges

Curriculum: initial time investment, slow process of integrating lab themes with course themes, requires focus in single geographic area

Technical Skills: differing skill levels & background with stats, confusion of number and percent, translating between theoretical and spatial analysis (e.g. using gender as a spatial variable), insufficient tools in ArcGIS to create legends, finding data difficult, importing data difficult
Thank You!