

## Procedures for Creating the Ghana ABM Data

Step 1: Convert original SPSS format GDHS data into csv formatted file.

Input: GDHS1998Individ\_georeferenced.SAV

Output: DHS98\_Ind.csv

Step 2: Make selection of desired fields, e.g. region, height, weight, household size, etc. (have SPSS name in files)

Input: DHS98\_Ind.csv

Output: DHS98.csv

Step 3: Rename fields, add coded fields (e.g., Flush\_Toilet, NoToilet, etc.), add filter fields (e.g. Region\_Filter, Height\_Filter etc.), and calculate/add BMI field. Filters used for selecting only records with BMI values at later step using ArcGIS. File has all years' data and Master\_Filter filed not used in ABM process.

Input: DHS98.csv

Output: GDHS\_AttrSelectForABM\_wBMI.xlsx

Step 4: Import the 1998 data sheet (DHS98\_Filtered) form the GDHS\_AttrSelectForABM\_wBMI.xlsx file, then filter out records without BMI value.

Software: ArcMap

Input: GDHS\_AttrSelectForABM\_wBMI.xlsx (worksheet: DHS98\_Filtered)

Output: Individuals\_1998\_filteredByBMI (geodatabase table)

Step 5: Calculate land cover based on 1998 cluster points and land cover rasters.

Code: Temp\_Buffer.py

Input: Ghana\_DHS1998\_wInStudyArea (geodatabase feature class),  
c2000\_landsat\_lclu\_map\_version02\_final, c2010\_landsat\_lclu\_map\_version02\_final  
(geodatabase raster files)

Output: Ghana\_DHS1998\_wInStudyArea (geodatabase feature class—same as input file with some fields added)

Step 6: Map selected individuals into EAs based on cluster point locations.

Code: point\_scatter.py

Input: Individuals\_1998\_filteredByBMI (geodatabase table), Ghana\_DHS1998\_wInStudyArea, EA\_ABM\_OID (geodatabase feature classes)

Output: GDHS1998\_Households (geodatabase feature class)

Step 7: Export GDHS1998\_Households feature class as shapefile.

Software: ArcMap

Input: GDHS1998\_Households (geodatabase feature class)

Output: GDHS1998\_Households.shp

Step 8: Create spatial neighborhood files.

Software: OpenGeoDa (or GeoDa for earlier versions)

Input: GDHS1998\_Households.shp

Output: GDHS1998\_Households\_kNN8.gwt, GDHS1998\_Households\_kNN16.gwt, GDHS1998\_Households\_kNN32.gwt, GDHS1998\_Households\_kNN64.gwt

Step 9: Convert gwt files to csv format using R.

Code: GDHS\_GWTtoCSV.R

Input: GDHS1998\_Households\_kNN8.gwt, GDHS1998\_Households\_kNN16.gwt, GDHS1998\_Households\_kNN32.gwt, GDHS1998\_Households\_kNN64.gwt

Output: GDHS1998\_Households\_kNN8.csv, GDHS1998\_Households\_kNN16.csv, GDHS1998\_Households\_kNN32.csv, GDHS1998\_Households\_kNN64.csv

Step 10: Create eigenvectors using SAS.

Code: GHDS\_Eig.sas

Input: GDHS1998\_Households.shp, GDHS1998\_Households\_kNN8.csv, GDHS1998\_Households\_kNN16.csv, GDHS1998\_Households\_kNN32.csv, GDHS1998\_Households\_kNN64.csv

Output: GDHS1998\_Households\_kNN8\_Eigvecs.csv, GDHS1998\_Households\_kNN16\_Eigvecs.csv, GDHS1998\_Households\_kNN32\_Eigvecs.csv, GDHS1998\_Households\_kNN64\_Eigvecs.csv

Step 11: Import eigenvector csv data and merge to feature class.

Software: ArcMap

Input: GDHS1998\_Households (geodatabase feature class),  
GDHS1998\_Households\_kNN16\_Eigvecs.csv, GDHS1998\_Households\_kNN32\_Eigvecs.csv,  
GDHS1998\_Households\_kNN64\_Eigvecs.csv

Output: GDHS1998\_Households (geodatabase feature class—eigenvector fields added)

Step 12: Export data.

Software: ArcMap

Input: GDHS1998\_Households (geodatabase feature class)

Output: GDHS1998\_Households.csv

Step 13: Recode text data to numeric values.

Code: Code\_Values.py

Input: GDHS1998\_Households.csv

Output: GDHS1998\_Households\_ABM.csv