UN-ESCAP Stats Café

Accessing and Using Subnational Population Statistics

Linda Peters, Esri
How to use GIS to Analyze Subnational Population Data

- ArcGIS as an Integrated System to Respond to COVID-19
- GIS Tools for Data Science and Spatial Analysis
- Esri Programs to Support your Work
COVID-19 Is Creating Massive Health & Business Challenges on a Global Scale
Where is the disease spreading?

Who & where are the vulnerable populations?

How effective are social distancing policies?

What is the impact of these policies?

Where do I need to deploy additional resources?
Health, Demographics and Statistics

Aid in understanding and response
GIS

A Complete System for Understanding and Responding to Pandemics

Integrating All the Data, Activities and Missions . . .
. . . Empowering Collaborative Action
An Integrated System for Managing COVID-19 Response

- Understand community risk
- Measure social distancing effectiveness
- Manage resources and select sites
- Communicate with the public

Understanding the Impacts of COVID-19: Five Steps

Step 1: Map the Cases
Step 2: Map the Spread
Step 3: Map Vulnerable Populations
Step 4: Map Your Capacity
Step 5: Communicate with Maps

Modeling & Analysis

Workflows

GIS Apps

Disease Spread (CHIME Integration)
Modeling & Spatial Analysis

Pattern Detection
Finding Statistically Significant Clusters & Patterns

Modeling Prediction
Predicting Geospatial Events/Phenomena

Site Selection and Resource Allocation

Helping Understand, Predict and Make Decisions . . .
. . . at Many Scales
Information Model for COVID-19 Response

Demographics
  Cases
Persons Tested
Hospitals
Forecasted Demand
Social Distance Restrictions
Mobility
Alternate Care Sites
Test Sites
Information Model for COVID-19 Response

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Cases
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Socioeconomic
Age
Race
Health Conditions
Vulnerable Populations
Lifestyle Segmentation (Tapestry)
Population / Housing Density
Spatial Analysis: Site Selection

- Testing Sites
- Treatment Sites
- Food Distribution Sites
A Two-Step Approach

1. Calculate Population Demand

2. Perform location-allocation analysis

Model the spread and impact of disease
Population Demand (learn how here)
Location-Allocation (learn how here)

Inputs:
- candidate locations
- risks
- facilities info (e.g., number of beds, ventilators)
- staffing info (doctors, nurses)
- road network or crow fly distance calculations
Summary of Actions

• Implement COVID-19 Information Model (prepare GIS data layers)
• Analyze health and demographic data (understand community risk)
• Model the Spread Of Disease (Spatial /Temporal modeling)
• Measure social distancing effectiveness (leveraging mobility data)
• Determine When and Where Hospital System Capacity is Exceeded
  - Forecast Impacts on Hospital Bed, ICU, and Ventilator Capacity
• Perform location analytics to
  - Identify optimal testing and treatment sites
  - Allocate resources (beds, equipment, personnel, ...)

Total Confirmed: 8,365,567
Total Deaths: 193,700
Total Recovered: 47,208
COVID-19 GIS Hub

Get maps, datasets, applications, and more for coronavirus disease 2019 (COVID-19).

Check back often—these resources will be updated with new information as it becomes available.

https://coronavirus-resources.esri.com
Americas: Montserrat
ArcGIS Solutions for Coronavirus

solutions.arcgis.com/#covid19

- Response
- Business Continuity
- Testing Sites
- Recovery Metrics
- Force Readiness
- Hospitalization and PPE
- Dashboards

- Other Tools:
  - Hubs
  - Economic Vulnerability analysis
  - Contact tracing
  - Proximity tracing
  - CHIME and CDC Surge models to forecast hospital peak capacity
Moving ahead with Esri GIS

Esri programs
  • Statistics Modernization Program
  • Disaster Response Program

Request Assistance and Explore Resources:
  www.esri.com/disaster

Request Assistance via Email:
  disaster_help@esri.com
COVID-19 Response Package

- Announced April 1st, WHO Member States and GOARN partners can request a free **COVID-19 Response Package:**
  - ArcGIS Solutions for Coronavirus Response
  - the ArcGIS Hub Coronavirus Response template,
  - ArcGIS Pro Advanced
  - ArcGIS Online
  - ArcGIS Insights

  until 31 December 2020