

## Development of Health GIS Applications

**Facility Accessibility Mapper:** Calculates and displays the area surrounding a health facility that meets a user-defined time-travel accessibility criteria. The spatially-enhanced accessibility algorithm accounts for variable walking speed, distance, topography (elevation and slope dynamics), and access to and conditions of roads.

**Facility Survey Analyzer:** Interfaces directly with the comprehensive health facility survey database and digital photographs. Queries, analyses, and comparisons are supported by health facility type, survey data categories, and geographical extent.

**Health Care Gap Analyzer:** Identifies gaps in health care coverage based on availability of basic and specialized services, health care providers, equipment, medicine, and other user-defined parameters.

**Demographic Profiler:** Generates choropleth maps based on key demographics available from the 2004 Yemeni Census. Data can be aggregated to any geographic level selected. Time series mapping available for key indicators that were surveyed in both the 1994 and 2004 Census.

**Service Network Provider:** Illustrates health care service network by specialty in each Governorate according to user-defined parameters.

**Data Integrator:** Incorporates user data directly into the Health GIS. For datasets that lack a common identification (ID) field, this tool attaches an ID field to the user's dataset by matching the name fields in both datasets and evaluates a most likely match. Once the ID field is present, the tool automatically joins the user's data into the Health GIS.

**Supply/Demand Evaluator:** Forecasting aid to estimate supply and demand for health care services based on user-defined futuristic parameters accounting for population dynamics and potential changes in the existing and future health system—such as resources, distribution, public/private availability.

**Risk Assessor:** Incorporates District-level human and environmental health risk data and generates appropriate indices to aid with planning, preparedness, and response to potential health risks.

**Manpower Tracker:** Analyzes the occupations and skill sets of the health cadre across the District compared to local population demographics to determine if staff are deployed optimally across local health facilities.

**Finance and Budget Analyzer:** Produces a recommended allocation of government health care resources on a quarterly basis. The most current Governorate health budgets are compared with national health accounts data, the comprehensive health facility database, and a demographic profile to estimate a recommended optimal allocation of resources for each District.

**Disease Outbreak Monitor:** Tracks cases of a targeted communicable disease over time and space. This tool is versatile enough to track an outbreak over a period of days and/or monitor endemic disease rates that are reported on a monthly or quarterly schedule and can relate number of cases/deaths to population size.

**Immunization Manager:** Integrates monthly/quarterly reports from the District immunization management information system. Identifies locations for deploying mobile support units or reallocating existing resources. Supports querying by period, time series mapping, and aggregate statistics.

**Donor Project Tracker:** Provides spatial overview of regional donor projects. Allows user to visualize where types of projects and funding levels are currently focused, and acts as a tool for needs assessment, targeting and project planning.

**Spatial Coverage Updater:** Interface for updating core GIS datasets as new data are available. Allows for seamless integration of new data so that existing tools are enhanced by new data and the system stays up to date.

Health GIS Applications	Geographic Levels				Data Requirements				Health System Issues				Tools					
	Facility	Village	District	Governorate	Health Info Systems	Health Facility Survey	Census	National Health Accounts	Donor Survey	Health Care Access	Decentralization	Health Finance/Economics	Environmental Health	Maternal & Child Health	Disease Control	Demographics	ArcGIS ArcView Tool	MapObjects Tool
1 Facility Accessibility Mapper	x	x			x					x	x		x				x	x
2 Facility Survey Analyzer	x					x				x	x	x	x				x	x
3 Health Care Gap Analyzer	x				x	x				x	x	x	x		x		x	x
4 Demographic Profiler	x	x	x	x			x						x	x	x		x	x
5 Service Network Provider	x	x	x		x					x	x		x				x	
6 Data Integrator	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7 Supply/Demand Evaluator	x		x		x		x			x	x	x					x	
8 Risk Assessor		x	x	x			x						x	x	x	x	x	
9 Manpower Tracker	x	x	x		x	x				x	x		x		x		x	x
10 Finance & Budget Analyzer	x		x		x		x			x	x						x	
11 Disease Outbreak Monitor		x	x		x							x		x			x	
12 Immunization Manager	x	x	x		x		x						x	x	x		x	
13 Donor Project Tracker			x	x				x		x		x	x	x	x	x	x	
14 Spatial Coverage Updater	x	x	x	x													x	

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