

Ecography

ECOG-03625

Murray, K. A., Olivero, J., Roche, B., Tiedt, S. and Guégan, J.-F. 2018. Pathogeography: leveraging the biogeography of human infectious diseases for global health management. – *Ecography* doi: 10.1111/ecog.03625

Supplementary material

Appendix 1

Table A1. Example data types and sources for the biogeographic analysis of human infectious diseases

Layer (Box 2)	Data type	Examples and sources
Geographic (G) / Environment (E)	Topo-hydrography:	GTOPO30 (US Geological Survey, 1996; https://ita.cr.usgs.gov/GTOPO30); Hydrologically conditioned DEM of HydroSHEDS (http://hydrosheds.cr.usgs.gov)
	Climate	WorldClim (http://www.worldclim.org)
	Forests	Global Forest Change (http://earthenginepartners.appspot.com/science-2013-global-forest); African forest atlases of the World Resources Institute (http://www.wri.org/tags/forest-atlas).
	Land-cover/land-use layers	GlobCover (GC) Land Cover version 2.1 database for 2005-2006 (Bicheron et al., 2008; http://due.esrin.esa.int/page_globcover.php) MODIS Land Cover (Global Land Cover Facility; http://www.landcover.org/data/lc/)
	Physical geography	Free GIS data (https://freegisdata.rtwilson.com/) - a categorised list of links to over 300 sites providing freely available geographic datasets
	Soils	FAO soils: http://www.fao.org/soils-portal/soil-survey/soil-maps-and-databases/harmonized-world-soil-database-v12/en/ World Soil Database: http://webarchive.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/ World Soil Information: http://www.isric.org/data/data-download
Reservoirs / hosts (R)	Species distributions	IUCN link
	Printed distribution atlases	Global atlases (worldwide handbooks based on presence polygons) Mammals: Wilson & Mittermeier (2009) Birds: del Hoyo et al. (1992)
	Continental distribution atlases	Mammals: Mitchell-Jones et al. (1999) for mammals in Europe (50×50-km gridded presences) Kingdom et al. (2013) and following volumes for mammals in Africa (presence polygons). Birds: Cramp et al. (1980) and following volumes for birds in the Palaearctic region (presence polygons) Hagemeijer & Blair (1997) for breeding birds in Europe (50×50-km gridded presences and abundance; see web platform at http://s1.sovon.nl/ebcc/eoa/ and http://www.ebba2.info/) Brown et al. (1982) and following volumes for birds in Africa (presence polygons).
	National atlases	Arnold HR (1993) in the United Kingdom (10×10-km gridded presences) Fayard et al. (1984) in France Palomo et al. (2007) and similar atlases by Dirección Nacional para la Biodiversidad in Spain (10×10-km gridded presences).
	Online occurrence databases	Global Biodiversity Information Facility (GBIF, http://www.gbif.org/) Mammal Networked Information System (MaNIS, http://manisnet.org/) ORNIS (http://www.ornisnet.org/) Vertnet: (http://www.vertnet.org/index.html)
Vectors (V)	Information databases	VectorBase (https://www.vectorbase.org/) MosquitoMap (http://www.mosquitomap.org/)

		VectorNet (https://vectornet.ecdc.europa.eu/)
Pathogens (P)	Human disease alerts / reports (includes pathogen specific information)	GIDEON link WHO Weekly Epidemiological Record link HealthMap (http://www.healthmap.org/en/)
	Global burden of disease (includes some pathogen specific information)	Institute for Health Metrics and Evaluation (http://www.healthdata.org/gbd/data)
	Vector borne disease information	VecNet (https://www.vecnet.org/) VectorNet (https://vectornet.ecdc.europa.eu/)
	Animal disease reports	EMPIRES (http://empres-i.fao.org/eipws3g/) WAHIS (World Animal Health Information System) Interface - providing access to information on reported disease events, disease distribution maps and disease outbreak maps. link
Human (H)	General information	FAO GeoNetwork (http://www.fao.org/geonetwork/srv/en/main.home)
	Human population	LandScan™ 2008 High Resolution Global Population Data Set (UTBattelle, LLC, operator of Oak Ridge 13 National Laboratory) MODIS 500-m Map of Global Urban Extent for 2001-2002 (Schneider et al., 2009; 2010).
	Human geography	Free GIS data (https://freegisdata.rtwilson.com/) - a categorised list of links to over 300 sites providing freely available geographic datasets
	Socioeconomic data	SEDAC (http://sedac.ciesin.columbia.edu)
Disease (D)	Disease data and maps	Global Health Atlas (http://apps.who.int/globalatlas/dataQuery/default.asp) USGS Disease Maps (https://diseasemaps.usgs.gov/) GIDEON (http://www.gideononline.com/infectiousdiseases/maps/) Global Incident Map (http://outbreaks.globalincidentmap.com/) CDC List of Maps (https://wwwnc.cdc.gov/travel/yellowbook/2016/list/maps) Worms and Germs Map: Companion animal and equine infectious disease mapping (http://www.wormsandgermsmap.com/) Global Atlas of Helminth Infections (GAHI http://www.thiswormyworld.org/data/about-the-download-data) Atlas of Human Infectious Diseases (https://infectionatlas.org/) ECDC E3 Geoportal: https://e3geoportal.ecdc.europa.eu/SitePages/Home.aspx Demographic Health Survey https://dhsprogram.com/
Other	General list of GIS spatial datasets	Wikipedia (https://en.wikipedia.org/wiki/List_of_GIS_data_sources)
	Host-pathogen associations	EID2 (Wardeh et al., 2015) (https://www.nature.com/articles/sdata201549) HPIDB 2.0 (http://hpidb.igbb.msstate.edu/); Ammari et al., (2016) (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4930832/) Phi-Base (http://www.phi-base.org/) PHIDIAS (http://www.phidias.us/introduction.php)