Linking Conservation and Development: A Global-scale Analysis of Demographics in High-value Conservation Areas

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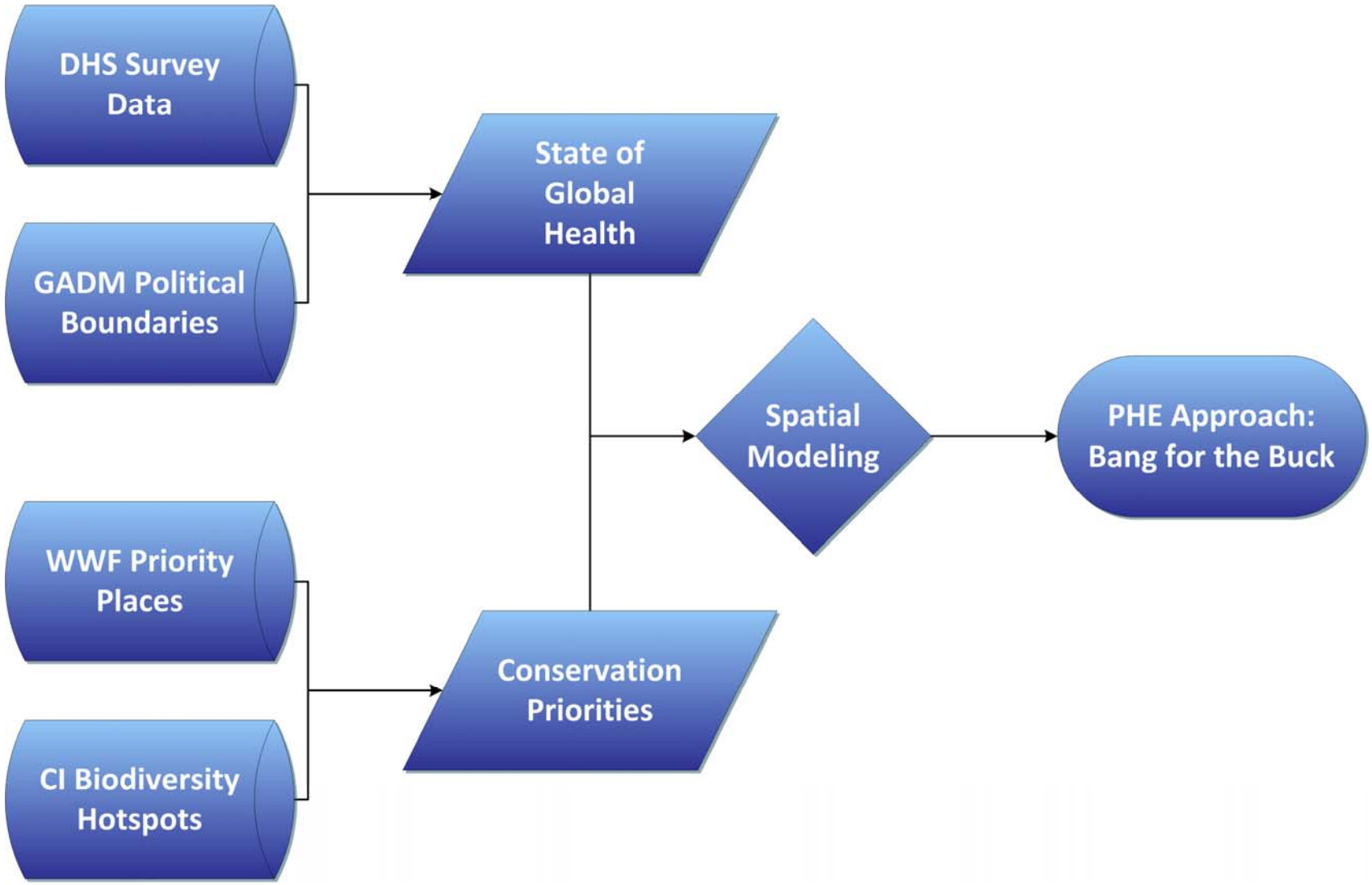
Introduction

- Biodiversity continues to **decline** globally, despite **increasing** investments in conservation
- Given limited funding, it may be wise to prioritize spending to ensure the greatest return on our conservation and development efforts
- Research suggestsinvestments in maternal and child health (MCH) can simultaneously achieve both conservation and development goals

Approach

1. Merge population data from the Demographic and Health Surveys (DHS) with two different approaches to mapping high-value conservation areas:
   - "Biodiversity Hotspots" from Conservation International (CI)
   - "Priority Places" from the World Wildlife Fund (WWF)
2. Model how demographics in high-value conservation areas compare with neighboring areas

Approach

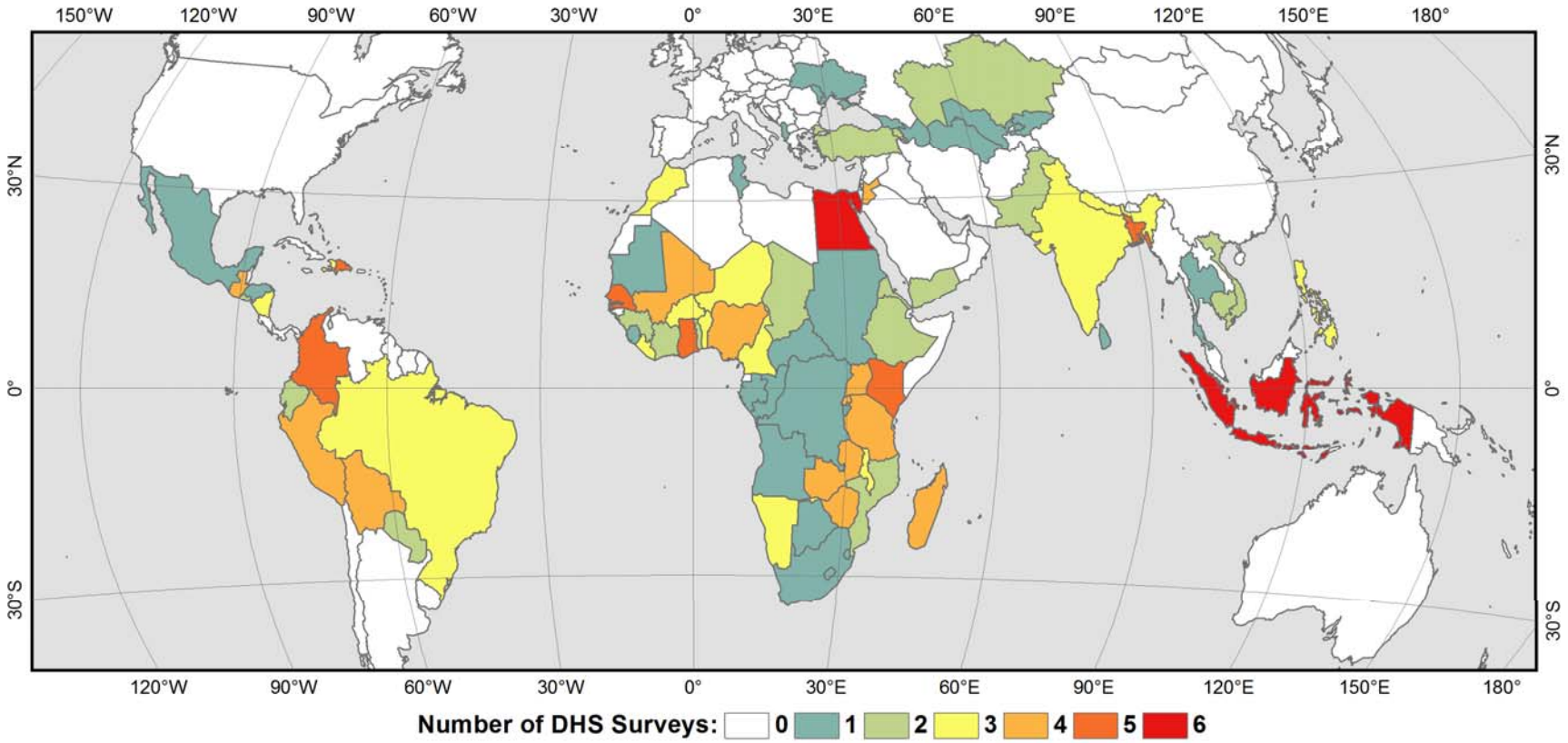

DHS Survey Data
GADM Political Boundaries
State of Global Health
Spatial Modeling
PHE Approach: Bang for the Buck
WWF Priority Places
CI Biodiversity Hotspots
Conservation Priorities

Methods: Spatial Modeling

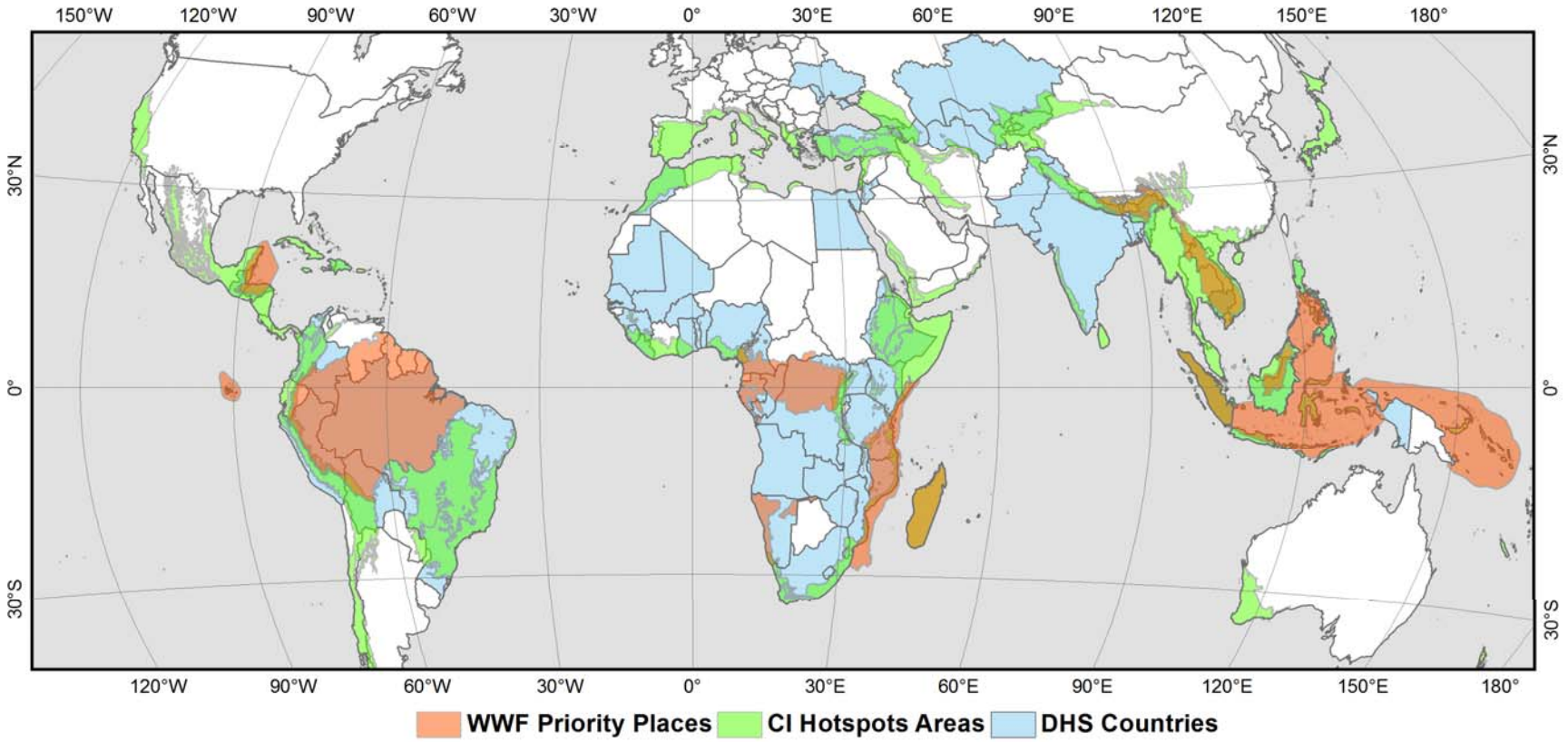
1. Test two alternative indicators of hotspot/priority place proximity
   - Inverse squared distance to CI Hotspot
   - Inverse squared distance to WWF Priority Place

2. Model:
   - Current total fertility rate
   - Unmet need for family planning services

Methods: Distribution of DHS Surveys



Methods: Map of High Priority Conservation Areas



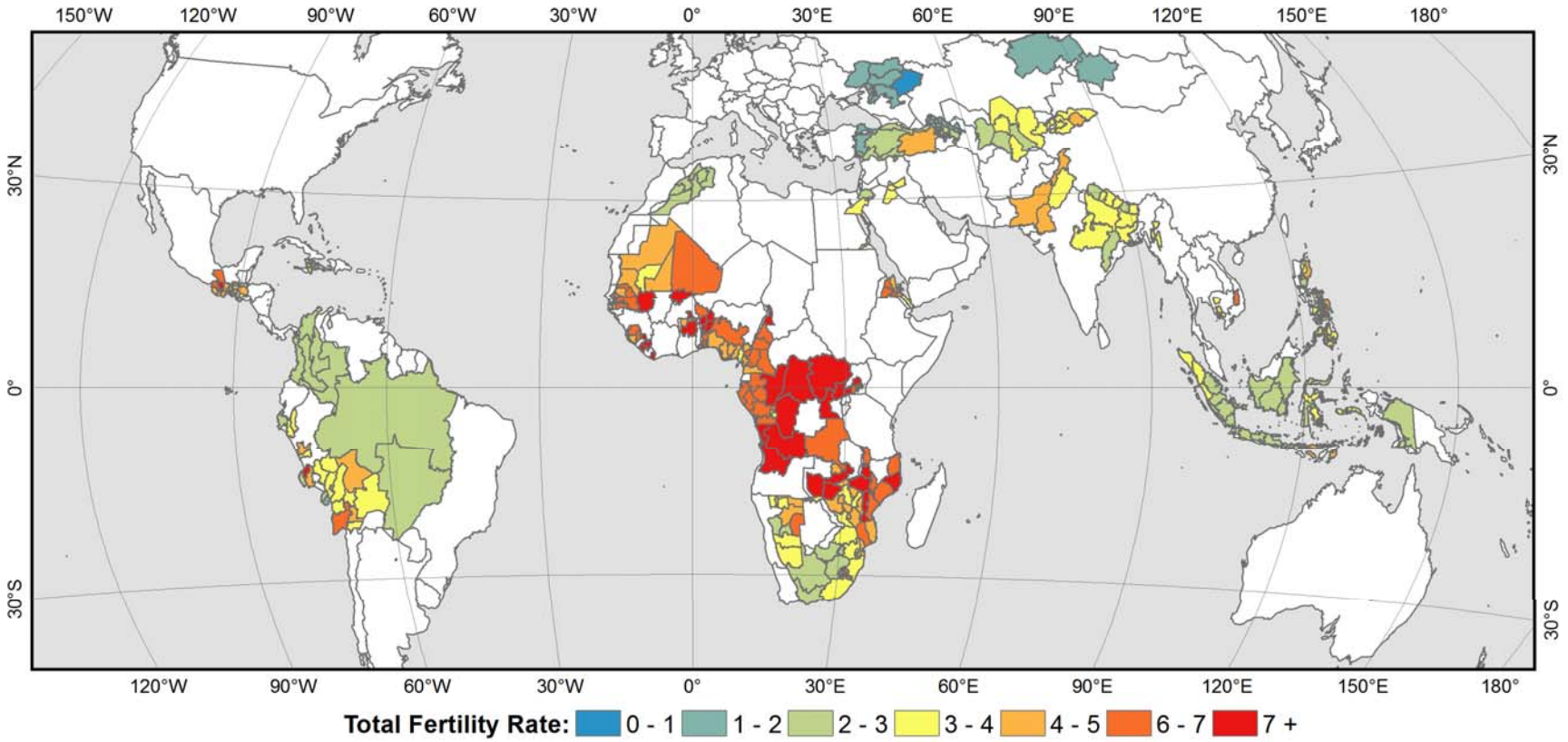
Methods : DHS Data

1. DHS data geocoded from StatCompiler
   – Dataset of 1227 regions in 79 countries

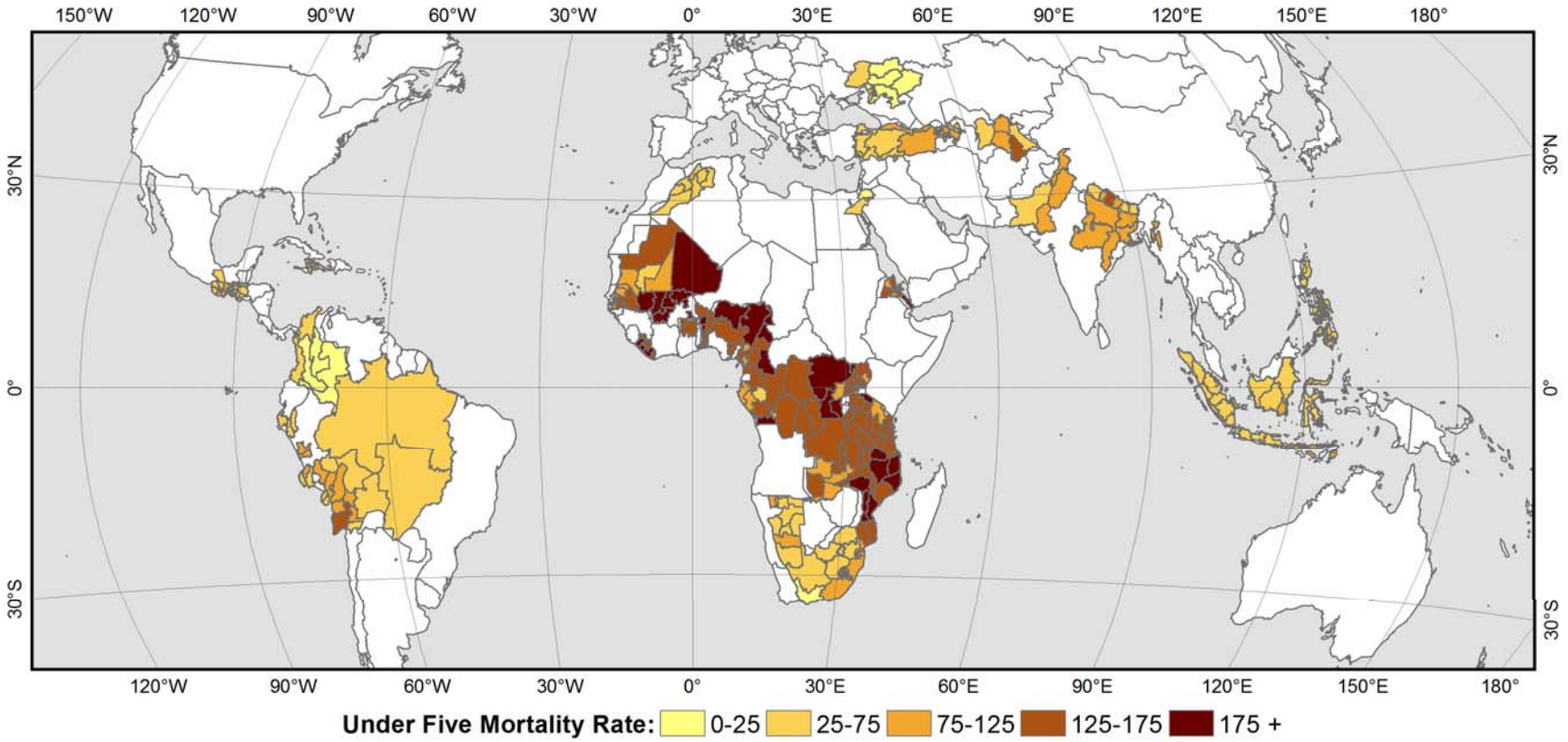
2. Reduce data to include:
   – Maximum of one survey per region (most recent)
   – Only surveys conducted since1996

3. Final dataset of 440 regions from 59 countries

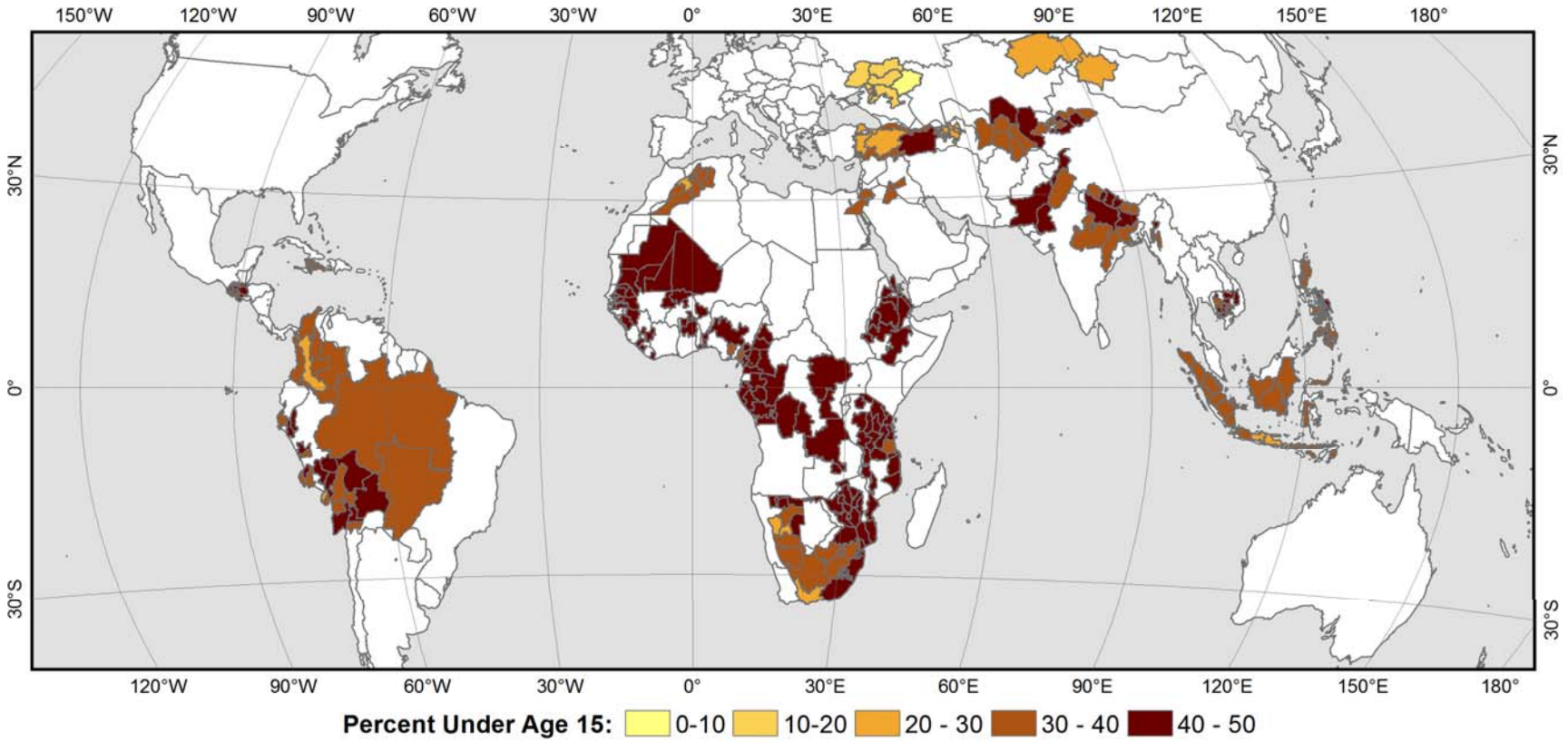
Results: Total Fertility Rate



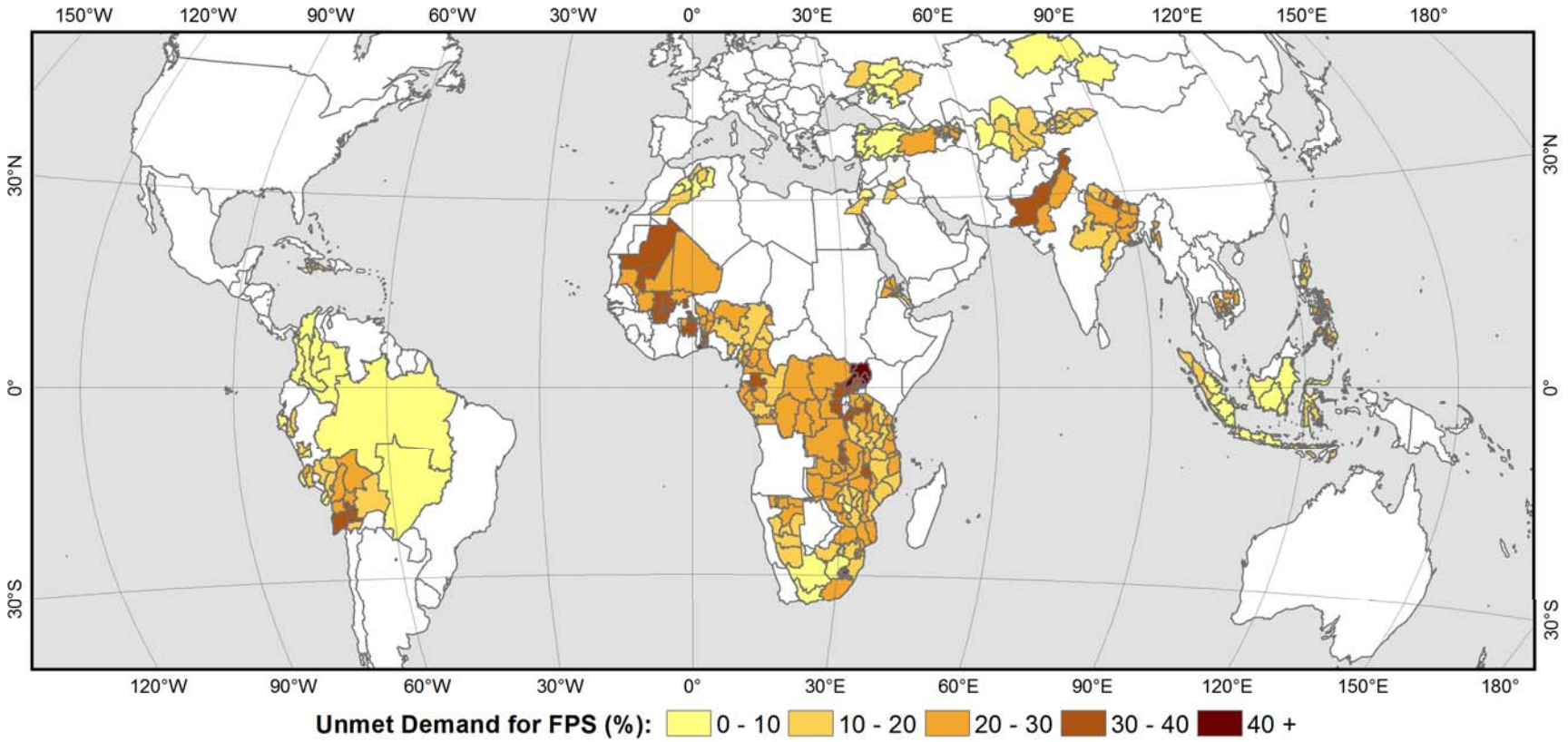
Results: Under Five Mortality Rate



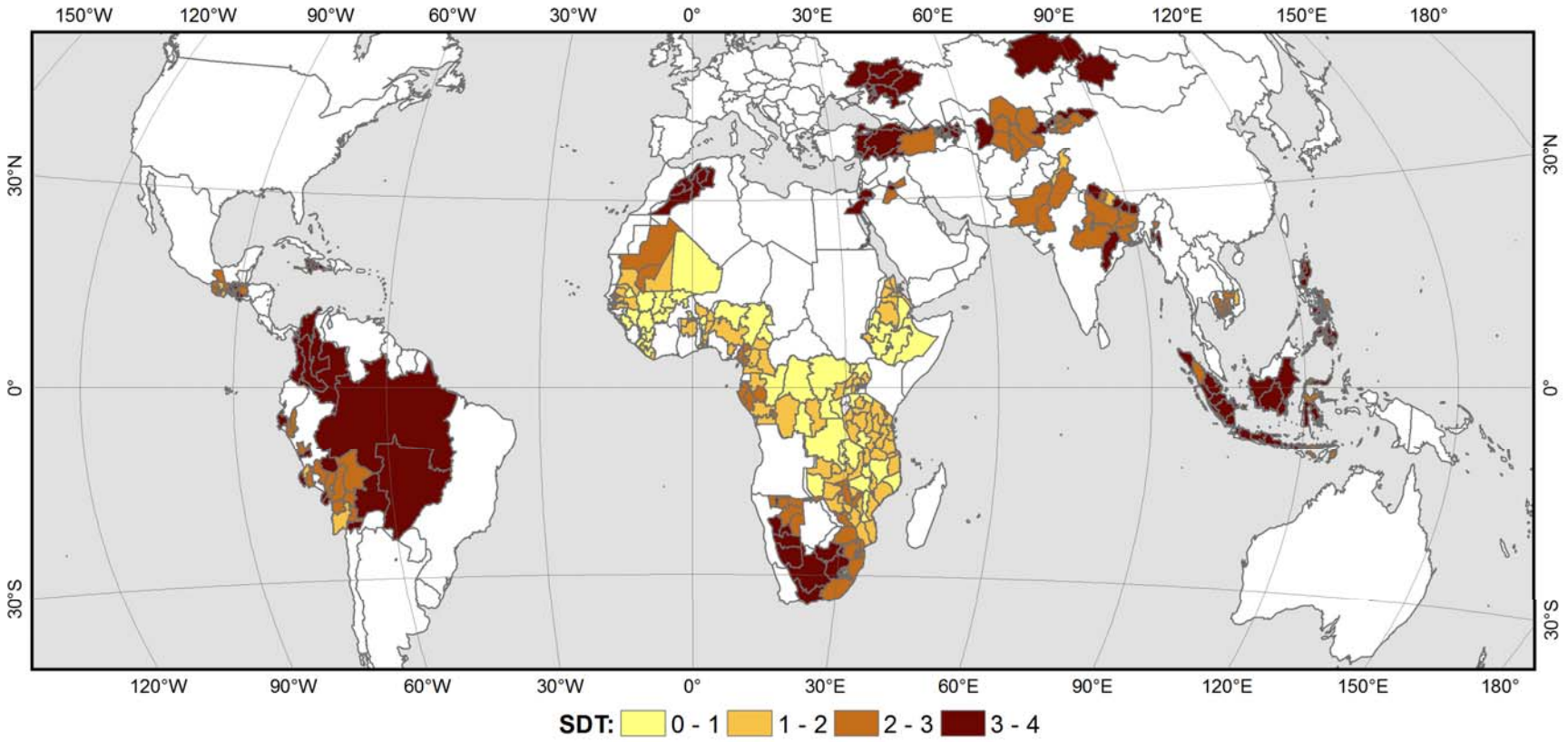
Results: Youth Population



Results: Unmet Demand for Family Planning



Results: Stage of Demographic Transition



Results: Predicting Current Total Fertility Rate

	Coeff.	p-value	Coeff.	p-value
CI Hotspot Inv. Sq. Dist.	-0.227	0.073 .		
WWF Priori Pl. Inv. Sq. Dist.			-0.236	0.056 .
Infant and child mortality rate	0.01	0.000 ***	0.01	0.000 ***
Agricultural employment	0.01	0.000 ***	0.01	0.000 ***
Primary schooling	0.006	0.146	0.007	0.103
Unmet need for FPS	0.037	0.000 ***	0.033	0.000 ***
Wealth	-0.517	0.000 ***	-0.528	0.000 ***
Intercept	3.355	0.000 ***	3.406	0.000 ***

NOTE: Dichotomous continent indicator variables were included, but are not listed here.

Results: Predicting Unmet Need for Family Planning

	Coeff.	p-value	Coeff.	p-value
CI Hotspot Inv. Sq. Dist.	2.207	0.030 *		
WWF Priori Pl. Inv. Sq. Dist.			-2.032	0.049 *
Continent – Asia	-7.334	0.000 ***	-5.18	0.004 **
Continent – Central America	-3.638	0.371	-2.627	0.511
Continent – Europe	-7.431	0.206	-7.717	0.184
Continent – South America	-8.527	0.021 *	-7.73	0.034 *
Agricultural employment	-0.031	0.102	-0.027	0.153
Primary schooling	0.097	0.008 **	0.112	0.002 **
Wealth	-5.879	0.000 ***	-5.962	0.000 ***
Intercept	36.334	0.000 ***	36.747	0.000 ***

Discussion

- CI defined hotspots differ significantly from the WWF Priority Places. WWF tends to include more rural areas, while CI tends to include more urban areas

- Areas near high-value conservation area tend to have lower TFRs than comparable areas

- Areas near the CI Biodiversity Hotspots have higher unmet need for FPS, but for the WWF Priority Places the opposite is true

Conclusions

- High-value conservation areas **do not** have unusually high current total fertility rates at this gross scale of analysis. We know this is not the case at finer scales.

- High unmet need for family planning in the developing world remains **significantly higher** in regions **within** WWF Priority Places

- Africa has **very high** unmet feed for FPS

Conservation may be less sustainable in Africa if it does not consider health

→ PHE

Acknowledgements

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Thank you. Questions?

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End of presentation.

Results: Basic Statistics

Variable	n	Mean	Min.	Max.	Std. Dev.
Inverse sq. distance from CI Biodiversity Hotspot	409	0.49	0	1	0.5
Inverse sq. distance from WWF Priority Place	409	0.24	0	1	0.42
Stage of demographic transition (SDT)	374	1.6	0	3	1.02
Wealth	374	1.59	0	2.88	0.75
Infant and child mortality rate	330	94.67	6.6	262.3	53.57
Total fertility rate	348	4.09	0.9	7.9	1.69
Wanted fertility rate	337	3.34	0.2	7.4	1.56
Unmet need for FPS	315	20.55	3.6	47.4	9.26
Percent lacking antenatal care	344	11.87	0	66.5	13.48
Problems accessing health care	263	71.71	22.5	99.1	16.85
Agricultural employment	310	41.86	0	96.4	28.31

Results: Predicting Unmet Need for Family Planning – Full Table

	Coeff.	p-value	Coeff.	p-value
CI Hotspot Inv. Sq. Dist.	**-0.227**	**0.073 .**		
WWF Priori Pl. Inv. Sq. Dist.			**-0.236**	**0.056 .**
Continent – Asia	-0.472	0.04 *	-0.586	0.006 **
Continent – Central America	-0.262	0.527	-0.486	0.236
Continent – Europe	-0.786	0.143	-0.779	0.155
Continent – South America	0.052	0.879	-0.025	0.941
Infant and child mortality rate	0.01	0.000 ***	0.01	0.000 ***
Agricultural employment	0.01	0.000 ***	0.01	0.000 ***
Primary schooling	0.006	0.146	0.007	0.103
Unmet need for FPS	0.037	0.000 ***	0.033	0.000 ***