MHDI: Human Development Index-like Small Area Estimates for Africa computed from IPUMS-International integrated census microdata

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MHDI is highly correlated with UNDP's HDI at the country level. MHDI comes from the census facilitating analysis for small areas.

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"Africa is the continent that could benefit the least from the [MHDI] methodology presented in this paper given the scarcity of census data in that region of the world."

--Permanyer, World Development, 2013

- Not true!!! Yes, there is a scarcity of African census data—but the bigger problem is *access*.
- Good news: 74% completed 2010 round census (vs. 55% for 2000)
- Bad news: only 30% facilitate access to census microdata.
- Biggest holdouts (by population): **NIGERIA, ALGERIA, ZAMBIA, & ZIMBABWE**
- Best practice: *Egypt, South Africa, Kenya, Uganda,* etc.

Join IPUMS now along with 100+ other National Statistical Institutes
Nigeria, Zimbabwe? Why be the last? Poor statistics? Poor access?

*** Commercial Break ***

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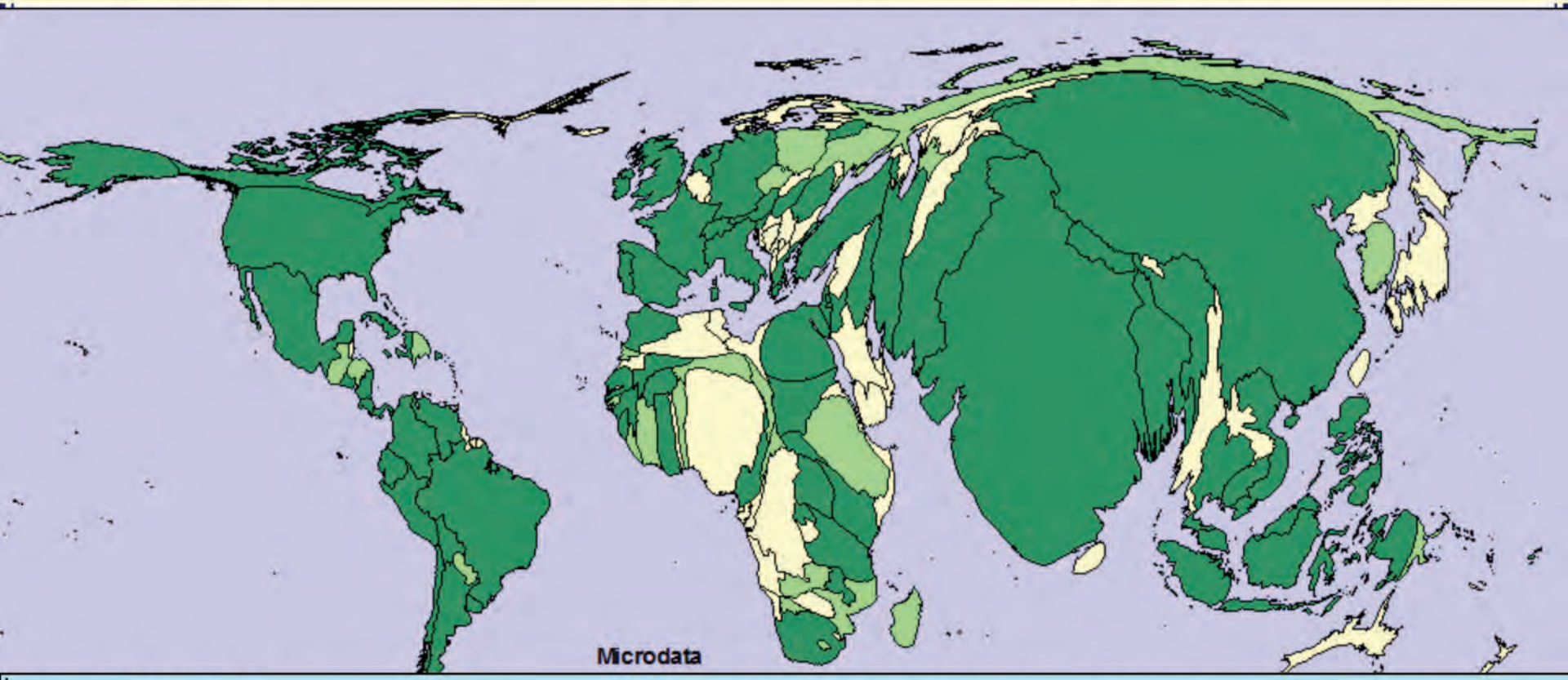
IPUMS-International: 2013 cartogram (weighted by population)

dark green = anonymized, harmonized and disseminating

74 countries, 238 samples, 540 million person records

bright green = integrating (25 countries, 75 censuses, 100 mill.)



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IPUMS-International shares African Center for Statistics Portal: http://ecastats.uneca.org/aicmd

African Integrated Census Microdata
AICMD

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PROJECT
- About AICMD
- Partners

DATA
- Apply for Access
- Create Extract
- Download or Revise Extract
- Citation

DOCUMENTATIONS
- Sources documents
- Metadata

RESOURCES
- African Microdata Inventory
- Microdata Handbook

IPUMS-Africa: Status of country's participation and condition of microdata

AICMD envisages to collecting and distributing census data from Africa for to support for Social and Economic Research. Its goals are to:

- Collect and preserve data and documentation
- Harmonize data
- Disseminate the data absolutely free!

IPUMS entrusted copies of all African census documents to ACS
Now, ACS maintains the site, updating with new docs ASAP

IPUMS International

African Census Microdata integrated into one database

African Center for Statistics Portal: http://ecastats.uneca.org/aicmd

AICN

Select Samp

Variable documenta
(more information

- All Samples
- Egypt
- Ghana
- Guinea
- Kenya
- Malawi
- Mali
- Morocco
- Rwanda
- Senegal
- Sierra Leone
- South Africa
- Sudan

All Samples		
Egypt	2006	1996
Ghana	2000	
Guinea	1996	1983
Kenya	1999	1989
Malawi	2008	1998	1987
Mali	1998	1987
Morocco	2004	1994	1982
Rwanda	2002	1991
Senegal	2002	1988
Sierra Leone	2004	
South Africa	2007	2001	1996
Sudan	2008	
Tanzania	2002	1988

June 2013: Kenya 2009, Burkina Faso (1985-2006), Cameroun (1976-2005). June 2014, 15, 16 … Nigeria?, Zimbabwe?

IPUMS-International: Online Data Analysis (SDA)

https://international.ipums.org/international/sda.shtml

MINNESOTA POPULATION CENTER, UNIVERSITY OF MINNESOTA

IPUMS International

Home | Select Data | FAQ | Contact | Login

PROJECT

About IPUMS-I
How to Cite IPUMS-I
User Registration and Login

DATA

Browse and Select Data
Download Your Data Extract
GIS and Other Data Files
Analyze Data Online

SAMPLES

Sample Descriptions
Variance Estimation
Source Documents

IPUMS Online Data Analysis System

The IPUMS online analysis system uses high-speed tabulation software developed at UC-Berkeley's Computer-assisted Survey Methods Program.

Click on any of the links below to get started. See the instructions page for information on using the system.

NOTE: The statistics produced by the online analysis system are derived from sample data. They may not match official published statistics.

Single-Sample Datasets

Argentina	2001	1991	1980	1970
Armenia	2001			
Austria	2001	1991	1981	1971
Belarus	1999			
Canada	2001	1991	1981	1971
Chile	2002	1992	1982	1970	1960

Analyze census samples: one sample, one country, one region

5 steps: Login. Select: sample(s), procedure, variables, filters. Run

SDA [Use classic interface] Selected Study: **Africa 1982-Present**

Analysis | Create Variables | Download | Codebook | Getting Started

Africa, 1982-present: 28 samples 55 million person records

Variable Selection: Help

Selected: age View

Copy to: Row Col Ctrl Filter

Mode: Append Replace

- Household - Appliances, Mechanicals, Other Amenities
- Household - Dwelling Characteristics
- Household - Other
- Household - Constructed Household
- Person - Technical
- Person - Constructed Family Interrelationship
- Person - Demographic
  - relate - Relationship to household head
  - related - Relationship to household head
  - age - Age
  - age2 - Age, grouped into intervals
  - sex - Sex
  - marst - Marital status
  - marstd - Marital status
  - consens - Consensual union
  - polygam - Polygamous union
  - agemarr - Age at first marriage or union
  - subfnum - Subfamily membership number

SDA Frequencies/Crosstabulation Program

Help: General / Recoding Variables

REQUIRED Variable names to specify

Row: edattan

OPTIONAL Variable names to specify

Column: sex

Control: sample

Selection Filter(s): age(25-34) × *Example: a*

Weight: wtper - Person weight

TABLE OPTIONS

Percentaging:

☑ Column ☐ Row ☐ Total

☐ Confidence intervals Level: 95 percent

☐ Standard error of each percent

N of cases to display:

☐ Unweighted ☑ Weighted

☐ Summary statistics

☐ Question text ☐ Suppress table

☑ Color coding ☐ Show Z-statistic

☐ Include missing-data values

CHART OPTIC

Type of chart:

Bar chart opti

Orientation:

Visual Effect

Show percent

Palette: Co

Size - width: 6

Tabulate: Educational attainment by sex. filter: 25-34 year olds

20 seconds to tabulate 7,046,636 valid cases (84,172,211 persons).

https://sda.international.ipums.org/cgi-bin/sdaweb/hsda3

Change number of decimal places to display

Statistics for all valid cases

Cells contain: -**Column percent** -Weighted N		sex			
		1 Male	2 Female	9 Unknown	***ROW TOTAL***
edattan	0: NIU (not in universe)	**.2** 100,650.0	**.2** 72,380.0	**.0** .0	***.2*** *173,030.0*
	1: Less than primary completed	**37.4** 15,085,009.6	**49.0** 21,488,057.7	**69.0** 200.0	***43.5*** *36,573,267.2*
	2: Primary completed	**33.7** 13,569,413.2	**28.5** 12,512,606.4	**3.4** 10.0	***31.0*** *26,082,029.6*
	3: Secondary completed	**22.0** 8,879,942.6	**17.6** 7,718,849.3	**13.8** 40.0	***19.7*** *16,598,831.9*
	4: University completed	**5.1** 2,070,245.8	**3.8** 1,687,021.5	**10.3** 30.0	***4.5*** *3,757,297.3*
	9: Unknown	**1.5** 602,830.2	**.9** 385,204.6	**3.4** 10.0	***1.2*** *988,044.7*
	COL TOTAL	***100.0*** *40,308,091.3*	***100.0*** *43,864,119.5*	***100.0*** *290.0*	***100.0*** *84,172,500.8*

Color coding:	<-2.0	<-1.0	<0.0	>0.0	>1.0	>2.0	Z
N in each cell:	Smaller than expected			Larger than expected			

Allocation of cases (unweighted)

934,094

Female disadvantage schooling completed
<u>ages 25-34:</u>
Primary .92
Secondary .87
University .81

Imagine analyzing census microdata for all Africa…
To build it: Endorse MOU. Entrust data. Integrate. Disseminate.

*** End of Commercial Break ***

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IPUMS International

MHDI – Municipal Human Development Index measuring change in HDI within & between countries

1. Introduction: HDI for small areas measured with one source
2. Methodology
   - Data: census microdata for 13 African countries (24 censuses)
   - Definitions: Health, Education, Standard of Living, Inequality
3. Results
   - Between countries: highly correlated with UNDP's HDI.
   - Within countries: pinpoint districts with greatest need
   - Inequality in MHDI: pattern of inequality strikingly different
4. Conclusions
   - MHDI is an informative measure for academics and policy makers
   - Particularly pertinent for Africa – Human Development is critical
   - Obstacle: lack of access to census microdata of African countries
     - ACAP (Pennsylvania) – lack of cooperation
   - Invitation to African Statistical Agencies to open access (IPUMS)

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MHDI – Municipal Human Development Index measuring change in HDI within & between countries

1. Introduction: HDI for small areas measured with the census

- Is Africa's "statistical tragedy" a matter of "Poor Numbers" or a lack of access to the numbers that exist?
- Census – detailed coverage at local level to pinpoint leaders and laggers
- Microdata - unit records of persons and households make possible detailed analysis of local level data
- IPUMS – integrates census microdata over time (1960s – present) and space
  - 100+ countries endorsed IPUMS MOU
  - 74 countries microdata integrated into the IPUMS database
  - AICMD maintains the mirror portal for all of Africa
- MHDI – Human Development Index for municipalities (districts)

Technical details: I. Permanyer (2013), Using Census Data to Explore the Spatial Distribution of Human Development, World Development http://dx.doi.org/10.1016/j.worlddev.2012.11.015

MHDI – Municipal Human Development Index measuring change in HDI within & between countries

1. Introduction
2. Methodology
   - Harmonized (integrated) census microdata samples (IPUMS/AICMD)
   - Table 1: 24 censuses representing 13 countries
   - Table 2: a few samples (e.g., Egypt) omitted for lack of "Children Surviving" in the census. (For 2020 round, include fertility module!)
   - Method – standard, normalized HDI with tweaks – See Permanyer. World Development (2013 http://dx.doi.org/10.1016/j.worlddev.2012.11.015)
     - Health: % surviving children in administrative district (CS/CEB, normalized)
     - Education: 2/3*Adult Literacy Ratio + 1/3*Gross Enrollment Ratio
       Adults = age 15+. GER = % aged 15-24 completing primary schooling
     - Standard of living: average amenities/household for each administrative district.
       "core" – amenities common to all countries (water, electricity, sanitation)
       "country specific" – use as many amenities as possible within each country
     - Inequality decomposition by factor components (Gini indices based on districts)
3. Results
4. Conclusions

Table 1. Basic information on the samples included in the analysis.

Country	Year	Population	Sample density	Administrative Units		
				Name	Levels	Number
Ghana	2000	18,941,330	10%	Districts	2	110
Guinea	1996	7,290,710	10%	Prefectures	2	34
Kenya	1989	21,481,960	5%	Districts	2	31
Kenya	1999	28,150,940	5%	Districts	2	69
Malawi	1987	7,986,690	10%	Districts	2	24
Malawi	1998	9,913,930	10%	Districts	2	26
Malawi	2008	13,419,770	10%	Districts	2	31
Mali	1987	7,853,840	10%	Comunes	3	221
Mali	1998	9,913,300	10%	Comunes	3	221
Morocco	1982	20,257,460	5%	Province/prefecture	2	63
Morocco	1994	25,880,520	5%	Province/prefecture	2	60
Morocco	2004	29,654,400	5%	Province/prefecture	2	60
Rwanda	1991	7,429,180	10%	Province	1	11
Rwanda	2002	8,433,920	10%	Province	1	12
Senegal	2002	9,945,620	10%	Department	2	34
Sierra Leone	2004	4,942,980	10%	Districts	2	14
South Africa	1996	40,578,357	10%	Municipalities	3	284
South Africa	2001	44,769,106	10%	Municipalities	3	225
South Africa	2007	47,173,595	2%	Municipalities	3	225
Sudan	2008	38,206,344	15%	Districts/counties	2	202
Uganda	1991	16,598,197	10%	Districts	2	113
Uganda	2002	24,974,490	10%	Districts	2	129

13 countries, 24 censuses

Most samples = 10%. Administrative units: 2 levels; 10-250 units

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   - Method – standard, normalized HDI at district level with tweeks
     - Health: % surviving children in administrative district (CS/CEB, normalized)
     - Education: 2/3*Adult Literacy Ratio + 1/3*Gross Enrollment Ratio
       Adults = age 15+. GER = % aged 15-24 completing primary schooling
     - Standard of living: average assets/household for each administrative district
     - Inequality decomposition by factor components (Gini indices based on districts)
       Which components contribute the most/least to inequality?
3. Results
4. Conclusions

MHDI – Municipal Human Development Index measuring change in HDI within & between countries

1. Introduction
2. Methodology
3. Results
   - Between countries – great variability from South Africa to Mali
     - Highly correlated with UNDP – HDI (r = .94) – (next slide)
     - [illegible]
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   - [illegible]
     - [illegible]
     - [illegible]
     - [illegible]
4. Conclusions

Table 3 (summary): MHDI by country and census round					
	1975-84	1985-94	1995-2004	UNDP HDI	2005-14
South Africa			0.70	0.63	0.82
Morocco	0.46	0.56	0.64	0.45	
Kenya		0.50	0.51	0.42	
Senegal			0.51	0.37	
Ghana			0.50	0.43	
Tanzania		0.45	0.48	0.35	
Uganda		0.34	0.47	0.37	
Sudan			0.46	0.37	
Malawi		0.30	0.36	0.34	0.41
Rwanda		0.37	0.34	0.30	
Sierra Leone			0.29	0.29	
Guinea			0.26	NA	
Mali		0.17	0.21	0.24	
Source: IP					

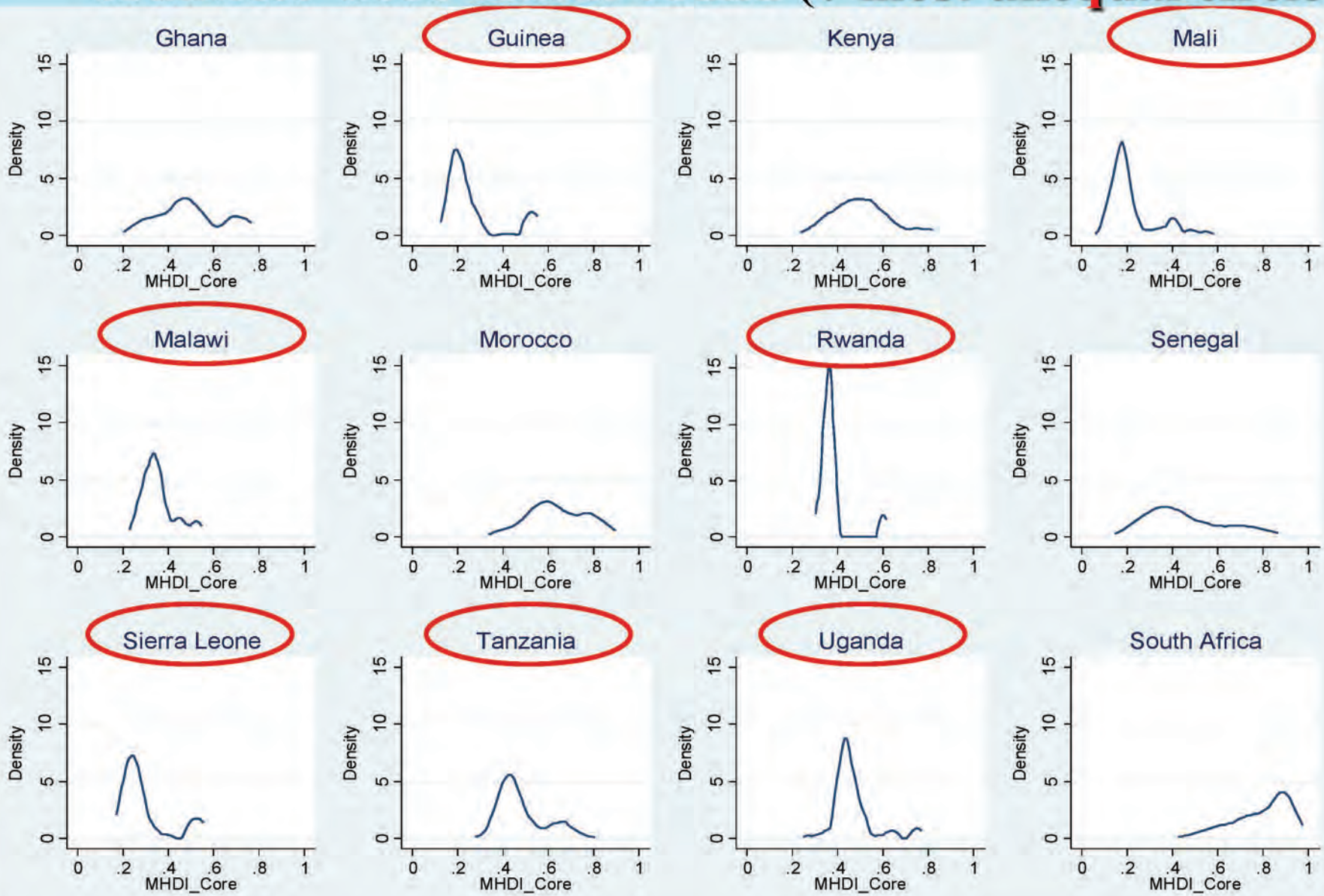
r = .94 MHDI is highly correlated with UNDP's HDI
MHDI comes from the census; NSIs take stewardship

IPUMS International

MHDI – Municipal Human Development Index measuring change in HDI within & between countries

1. Introduction
2. Methodology
3. Results
   - Between countries –
     - Highly correlated with UNDP – HDI (r = .94) –see previous slide
     - MHDI has bigger range and can be computed for every census (with fertility module)
     - Contribution of Education, Health, and Amenities differs greatly by country.
     - NSB can take charge of its numbers instead of solely relying on UNDP
     - MHDI can be computed from health and other surveys.
   - Within country
     - Improvement over-time, except not Rwanda (1991-2002—deterioration of health index) or South Africa (2001-2007 also deterioration due to rising mortality).
     - "Bumps" in distribution might be due to urban-rural divide
     - Inequalities. very high: Guinea, Malawi, Mali, Rwanda and Sierra Leone. Relatively low: Kenya, Morocco and South Africa (next slide)
4. Conclusions

Figure 7. Density functions of MHDI for 12 African countries 2000 census round (7 most unequal circled)



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MHDI – Municipal Human Development Index measuring change in HDI within & between countries

Conclusions

- MHDI is an informative measure for academics and policy makers
- Particularly pertinent for Africa – Human Development is critical
- Obstacle: lack of access to census microdata of African countries
  - ACAP (Pennsylvania) – lack of cooperation
- Invitation to African Statistical Agencies to open door to IPUMS
  - Nigeria: National Bureau of Statistics - General Household Surveys
  - Zimbabwe: ZimSTATS
  - Ghana: entrust 2010 census microdata as soon as data processing is complete

- *"Delay is the deadliest form of denial."*
  – C. Northcote Parkinson (1957)

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Thank you!

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