



IPUMS
GLOBAL HEALTH

Challenges and Solutions to Combining Data from IPUMS Global Health Surveys

Anna Bolgrien, Miriam King, Devon Kristiansen

University of Minnesota, USA

IPUMS

Zoom logistics

- Webinar is being recorded and will be posted
- Real-time closed captions are being auto-generated
- Turn on/off by clicking “CC” button in Zoom controls
- Send questions about Zoom directly to host via chat (IPUMS)
- Submit content questions with Q&A tool
- Will post written Q&A document (and any webinar specific files) following webinar

A note on uncertainty...

***Trump Administration Ends Global
Health Research Program***

The Demographic and Health Surveys were the only sources of reliable information in many countries on metrics such as mortality, nutrition and education.

... and our commitment to researchers

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

4796138925825634972846961
2862514197341212569321437
3154782418936587121934598
928386935389276967
347914272938424
1528421687663928948718289
691487252529174676465
5362593217875927823
7195729383237294576
8647386435958721659837
3252147916274181421539898
9419829869181421539898
83616915956471533739484
192542468192542468
6847213321491953612146
56387674584239428652587
7291936394565417649172642
3874291562789679316431925
5938724619628951479254386

- Web based data dissemination
- Survey & census microdata
- Harmonized variables
- Easily accessible documentation
- FREE
- Based at University of Minnesota

IPUMS.ORG



IPUMS GLOBAL HEALTH

Data Collections

IPUMS DHS

DEMOGRAPHIC AND HEALTH SURVEYS

Integrated Demographic and Health Surveys from The DHS Program, currently covering Africa and South Asian surveys from the 1980s to the present.

[GET DATA](#)

IPUMS PMA

PERFORMANCE MONITORING FOR ACTION

Integrated PMA surveys on fertility, contraception, hygiene, and health, administered frequently to monitor trends in select high-fertility countries.

[GET DATA](#)

IPUMS MICS

MULTIPLE INDICATOR CLUSTER SURVEYS

Integrated MICS surveys covering child health and well-being.

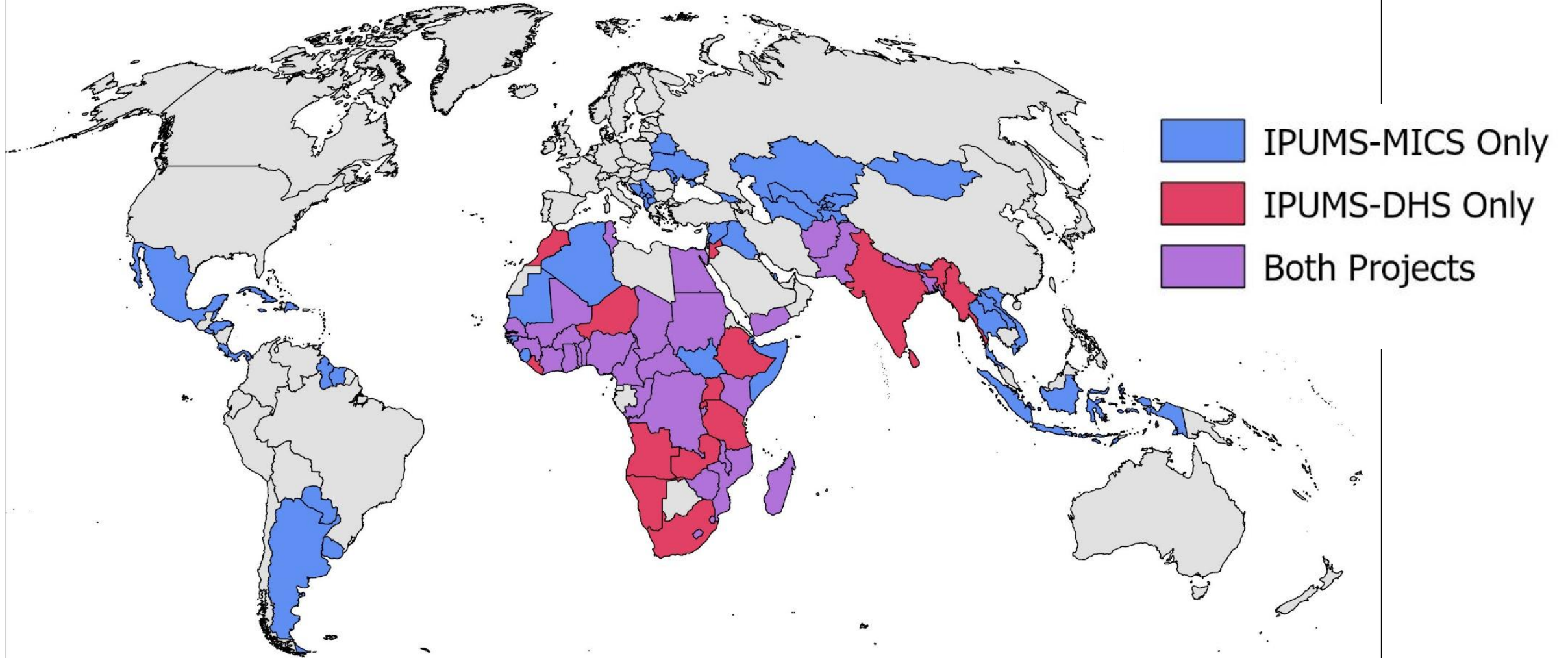
[GET DATA](#)

IPUMS DHS, MICS, and PMA

- Nationally representative household surveys
- Predominantly Low- and Middle-Income Countries
- Focus on women's and children's health and wellbeing

	DHS	MICS	PMA
Countries	51	89	11
Samples	233	211	200
Variables	20,000+	1000+	9000+
Years	1980-(2023)	2005-	2013-2024
Frequency	5-10 years	5-10 Years	Annual

Countries harmonized in IPUMS DHS and IPUMS MICS



UNITS	IPUMS DHS	IPUMS MICS	IPUMS PMA
Household Members	X	X	X
Household	X	X	
Women (15-49 years)	X	X	X
FGMC Daughters	X	X	
Calendar	X		X
Births	X	X	
Children (0-4 years)	X	X	X
Children (5-17 years)		X	
Men (15-49+ years)	X	X	
Service Delivery			X
Infant Panel			X
Longitudinal			X

Interoperability

With so many similarities, can we pool data
across projects?

Yes!

Considerations

How to approach an analysis using multiple surveys

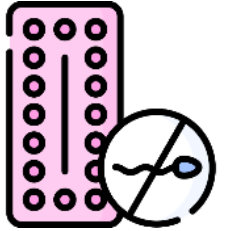
Considerations

- Topics
- Population
- Geography
- Survey design
 - Question wording
 - Skip patterns
- Variable names and coding
- Creating data extract for analysis

- **Within** data collection
- **Across** data collections
- Example
- IPUMS GH support



Example analysis



- What is the relationship between age, family planning use, and access to mobile phones?
- Does this association differ across time and place?

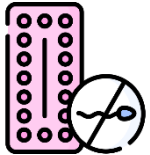
Topic and variable availability

What is your topic of interest?

For example...



- Child Health -> MICS and DHS



- Family Planning Providers -> PMA and DHS

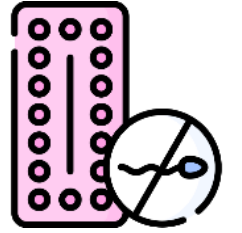


- Life Satisfaction -> MICS



- Longitudinal -> PMA or DHS calendar data

Example: Mobile Phones and Family Planning



Mobile phones

Project	Topics
PMA	Household has phone
DHS	Household has phone WM has phone
MICS	Household has phone WM has phone

Family Planning

Project	Topics*
PMA	FP use: current , past, discontinued FP knowledge Reasons for using/not using FP Attitudes towards Side effects Contraceptive calendar
DHS	FP use: current , past, discontinued FP knowledge Contraceptive calendar Reasons for using/not using FP
MICS	FP use: current FP knowledge

*select examples

IPUMS Discovery



IPUMS DISCOVERY

Search for variables across all IPUMS microdata collections

OPTIONS ▾ SEARCH

FILTERS

IPUMS DATA COLLECTION

[\(Deselect all\)](#)

Select collections (12 of 12) ▾

GEOGRAPHY

ONLY SHOW U.S. RESULTS

[\(Deselect all\)](#)

Select countries (159 of 159) ▾

YEAR RANGE

SHOW PRE-1960 RESULTS

1960 ▾ to 2025 ▾

IPUMS DISCOVERY

Search for variables across all IPUMS microdata collections



IPUMS

GLOBAL HEALTH

heard contraceptive

CPHEARDTRADOTH Heard of: other traditional method

MICS

∨ *Multiple (6)*

CPHEARDMODOTH Heard of: other modern method

MICS

∨ *Multiple (4)*

CPHEARDYN Heard of family planning method

MICS

∨ *Multiple (2)*

FPKNOWD Ever heard of withdrawal for FP

PMA

∨ *Multiple (11)*

FPKNOFST Ever heard of female sterilization for FP

PMA

∨ *Multiple (11)*

FPKNORHY Ever heard of rhythm for FP

PMA

∨ *Multiple (11)*

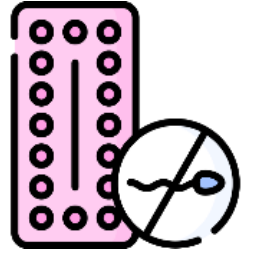
Populations

What is the population for your research question?

Population typically relates to “Unit of Analysis”

Unit of Analysis	IPUMS DHS	IPUMS MICS	IPUMS PMA
Household Members	X	X	X
Household	X	X	X
Women	X	X	X
Birth History	X	X	
Children 0-4	X	X	X
Men	X	X	

Population for Women's Family planning



Unit of Analysis	IPUMS DHS	IPUMS MICS	IPUMS PMA
Household Members	X	X	X
Household	X	X	X
Women	X	X	X
Birth History	X	X	
Children 0-4	X	X	X
Men	X	X	

Population for Child Discipline

Unit of Analysis	IPUMS DHS	IPUMS MICS	IPUMS PMA
Household Members	X	X	X
Household	X	X	X
Women	X	X	X
Birth History	X	X	
Children 0-4	X	X	X
Men	X	X	

Are there differences in the population included?

Sample design

Married women only

VS

All women of childbearing age

Survey design

Children age 0-4 of interviewed women (DHS)

VS

Children age 0-4 within a household (MICS)



FPTYPNOW (V313)

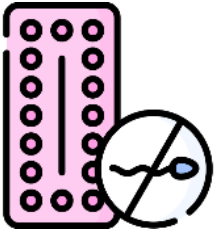
ADD TO CART

Current FP use by method type (folk, traditional, modern)

[Return to Recent use of family planning variables list](#)

CODES	DESCRIPTION	COMPARABILITY	UNIVERSE
	Universe		
	Afghanistan 2015: Ever-married women age 15-49.		
	Angola 2015: All women age 15-49.		
	Bangladesh 1994: Ever-married women age 10-49.		
	Bangladesh 1997: Ever-married women age 10-49.		
	Bangladesh 2000: Ever-married women age 10-49.		
	Bangladesh 2004: Ever-married women age 10-49.		
	Bangladesh 2007: Ever-married women age 15-49.		
	Bangladesh 2011: Ever-married women age 12-49.		
	Bangladesh 2014: Ever-married women age 15-49.		
	Bangladesh 2018: Ever-married women age 15-49.		
	Benin 1996: All women age 15-49.		
	Benin 2001: All women age 15-49.		

Example: Mobile Phones and Family Planning



Sample design differences across & within databases

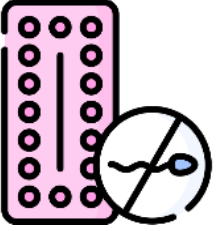
- All women
- Ever married women
- Currently married/in union women

Solution: Restrict analysis to currently partnered women

- Married and/or cohabitating

Filter or drop cases to impose least common denominator

Example: Mobile phone and Family Planning



Universe differences for variables on FP use across projects

- Pregnancy status
- Partnered status
- Ever used family planning

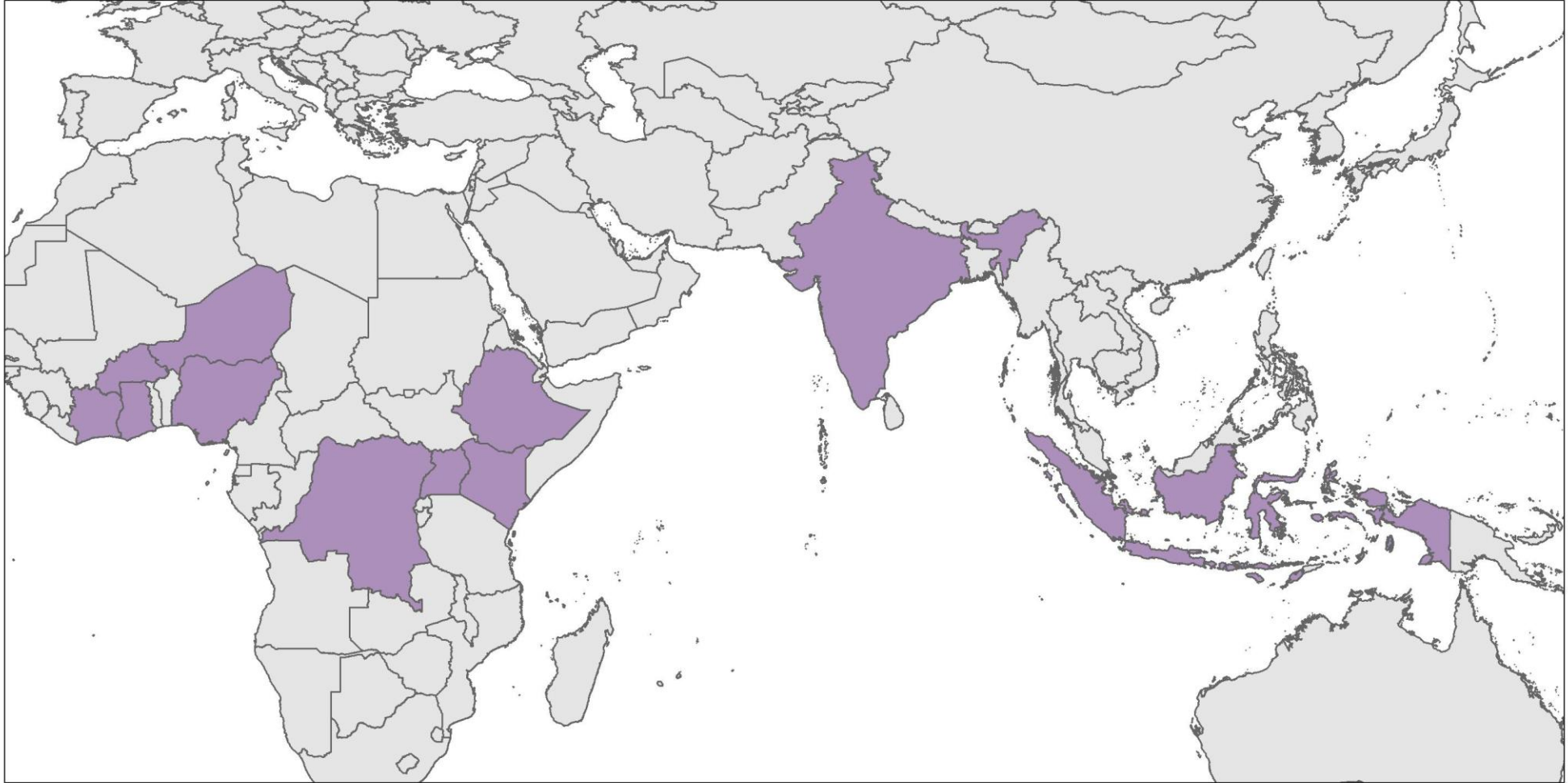
Solution:

- Keeping only non-pregnant and currently partnered women, recode where appropriate or drop samples

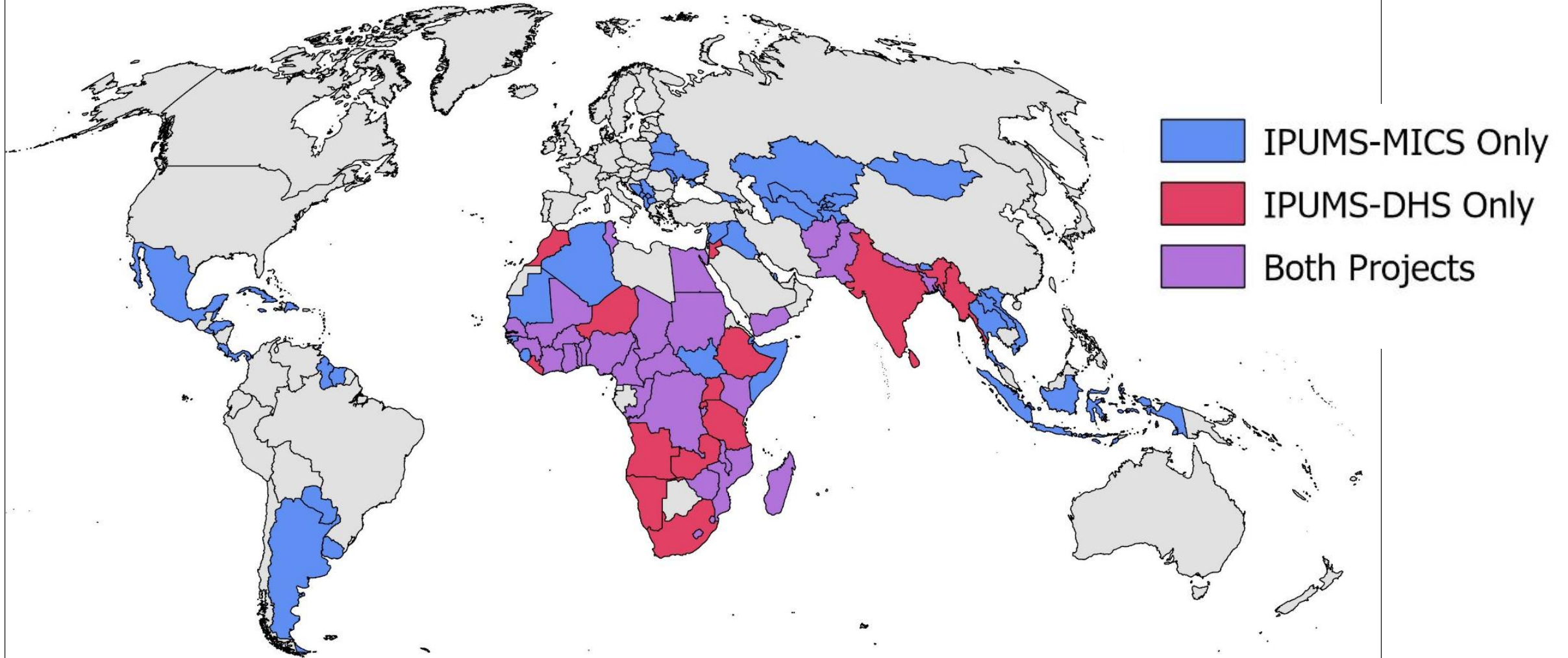
Geography

Geographic coverage, boundaries, and subnational units

Countries included in IPUMS PMA



Countries harmonized in IPUMS DHS and IPUMS MICS



Spatial Harmonization

- Geographic detail varies across samples
(from political change or detail in source data)
- Consistent boundaries needed to study subnational change over time

Change over time within project (PMA)

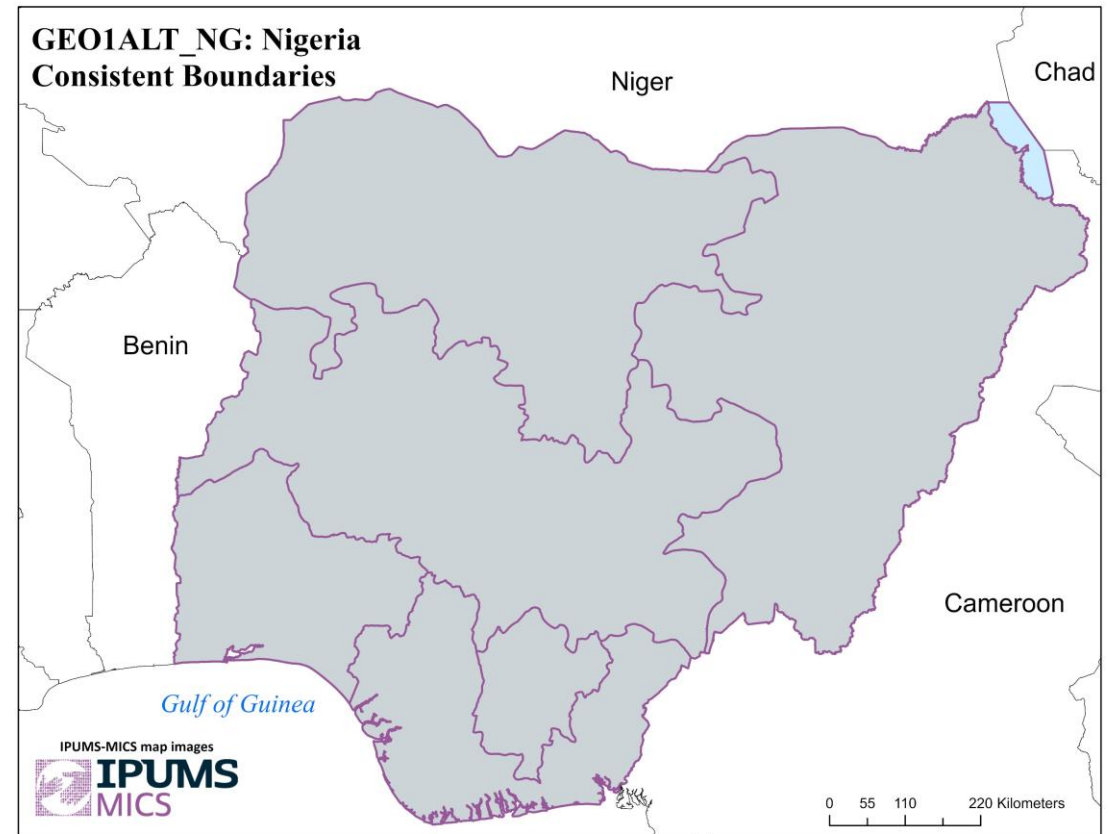
2014-
2019



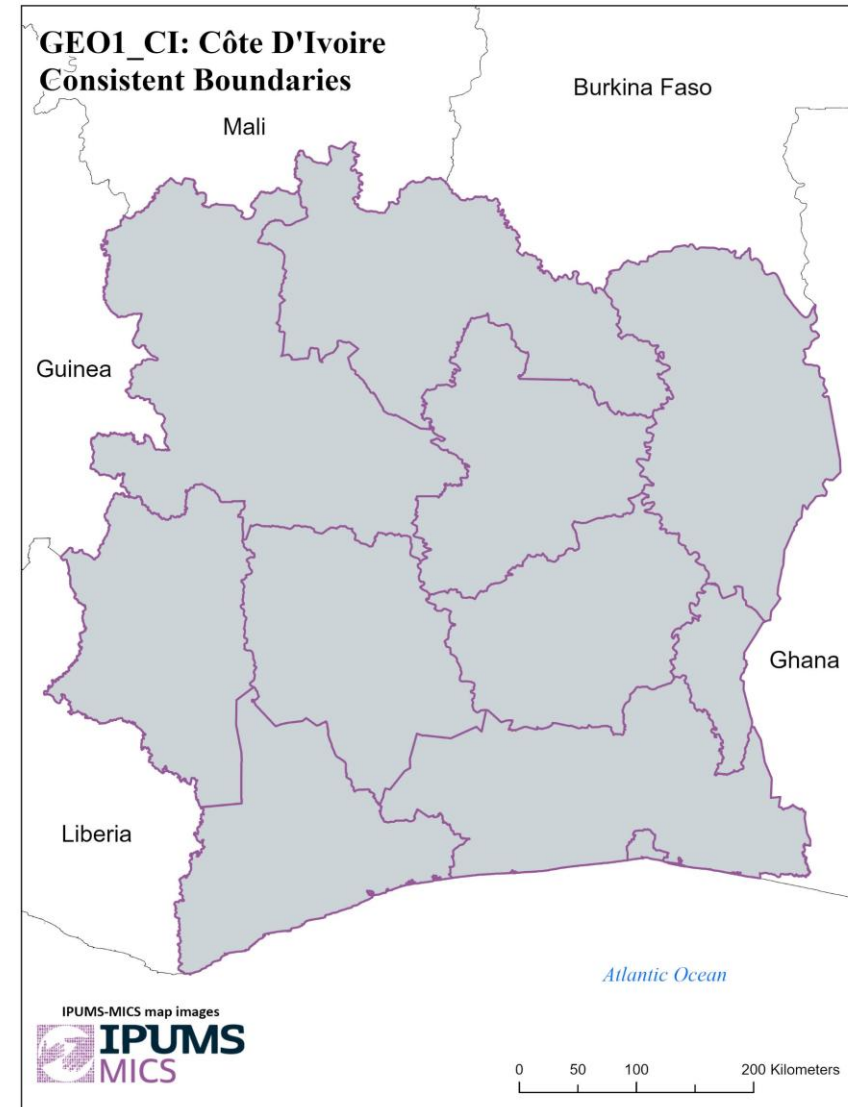
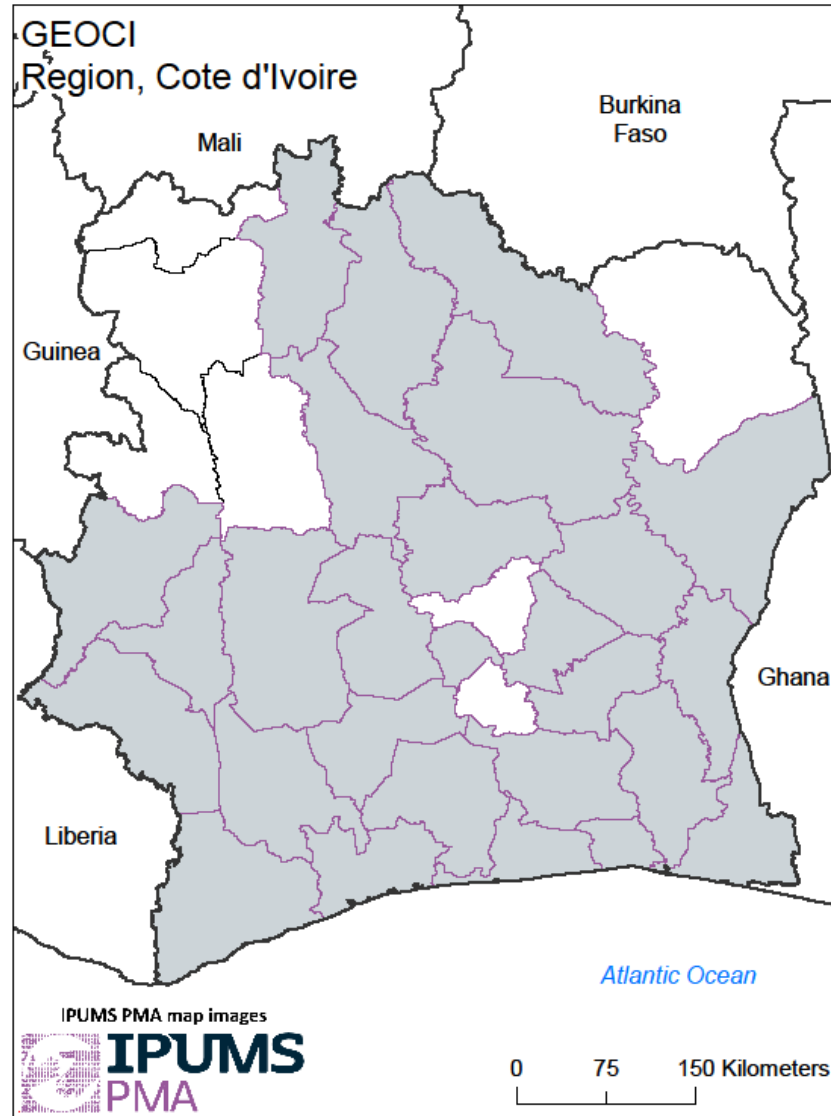
2020



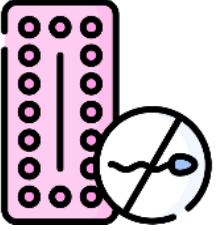
Comparable zones in Nigeria across surveys



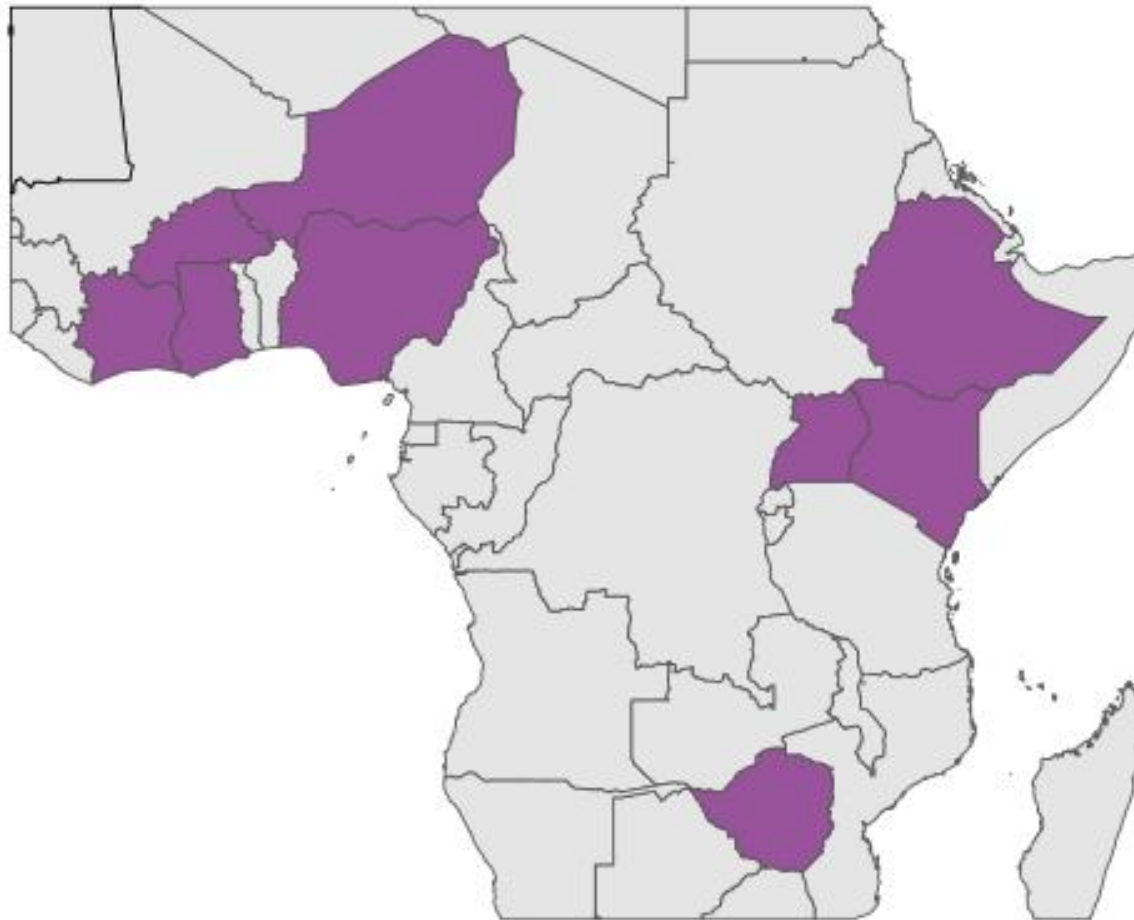
Cote d'Ivoire coverage differs



Example: Mobile Phone and Family Planning



Countries included in our research example



Burkina Faso
Cote d'Ivoire
Ethiopia
Ghana
Kenya
Niger
Nigeria
Uganda
Zimbabwe

Resources & Support

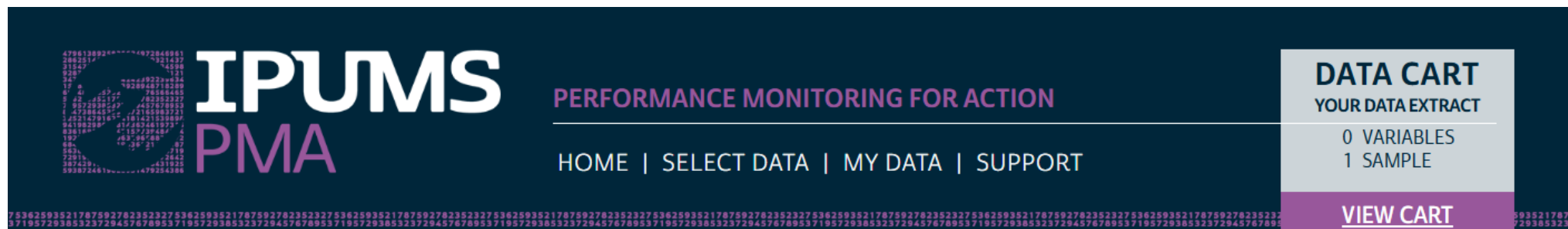


- IPUMS DHS and IPUMS International geographic variables crosswalk
- Future crosswalk planned between DHS and MICS
- Review PDF maps of geographic boundaries on IPUMS websites to check for consistent boundaries

Survey & Questionnaire Design

Metadata documentation created by IPUMS

Questionnaire Text tab



IPUMS PMA
PERFORMANCE MONITORING FOR ACTION

DATA CART
YOUR DATA EXTRACT

0 VARIABLES
1 SAMPLE

VIEW CART

HOME | SELECT DATA | MY DATA | SUPPORT

FPCURRUSE

ADD TO CART

CHANGE SAMPLES

Currently using method of FP

[Return to Current or Recent Family Planning Use variables list](#)

CODES	DESCRIPTION	COMPARABILITY	UNIVERSE	AVAILABILITY	QUESTIONNAIRE TEXT
-----------------------	-----------------------------	-------------------------------	--------------------------	------------------------------	---------------------------

Questionnaire Text

[Burkina Faso 2014](#)

Burkina Faso 2014

[top](#)

Questionnaire form

view entire document: [text](#)

22. Are you currently doing something or using any method to delay or avoid getting pregnant?

Comparability tab

The banner features the IPUMS PMA logo on the left, with the text 'PERFORMANCE MONITORING FOR ACTION' in pink. Below this, navigation links 'HOME | SELECT DATA | MY DATA | SUPPORT' are displayed. On the right, a 'DATA CART' box shows 'YOUR DATA EXTRACT' with '0 VARIABLES' and '0 SAMPLES'. The background is dark blue with a grid of small white numbers.

FPCURRUSE

ADD TO CART

SELECT SAMPLES

Currently using method of FP

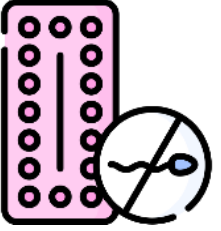
[Return to Current or Recent Family Planning Use variables list](#)

CODES	DESCRIPTION	COMPARABILITY	UNIVERSE	AVAILABILITY	QUESTIONNAIRE TEXT
-------	-------------	---------------	----------	--------------	--------------------

Comparability

In addition to universe differences, there is also some variation in question wording. In many surveys, this question is worded as "Are you currently doing something or using any method to delay or avoid getting pregnant?" while others ask "Are you *or your partner* currently doing something or using any method to delay or avoid getting pregnant?" (emphasis added). See Questionnaire Text tab for more details.

Example: Mobile phones and Family Planning



"Are you currently doing something or using any method to delay or avoid getting pregnant?"

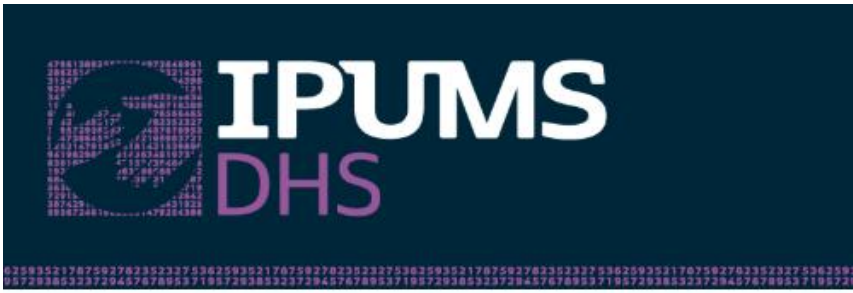
versus

"Are you *or your partner* currently doing something or using any method to delay or avoid getting pregnant?" (emphasis added)

Documented in the Comparability tab on specific variables

Variable names & codes

Harmonized within a database, not across databases



Integrated variable codes

FPMETHNOW (V312)

Current method of FP

An 'X' indicates the category is available for that sample

Code	Label	afghan	angola	bang	bang	bang	bang	bang	bang	bang	bang	benin	benin	benin	benin	benin
		15	15	94	97	00	04	07	11	14	18	96	01	06	11	17
000	Not using	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
100	MODERN METHODS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
101	Pill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
102	IUD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
103	Norplant/Implants	X	X	.	X	X	X	X	X	X	X	.	X	X	X	X
104	Condom	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
105	Female Condom	.	X	.	.	.	.	.	.	.	.	.	.	X	X	.
106	Female Sterilization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
107	Male Sterilization	X	X	X	X	X	X	X	X	X	X	.	.	.	.	.
110	Injections	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
111	Injection (3 monthly)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
112	Injection (monthly)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
120	Diaphragm/Foam/Jelly	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.
121	Diaphragm	.	.	.	.	.	.	.	.	.	.	.	X	X	.	.
122	Diaphragm/Foam	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
123	Diaphragm/Jelly	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
124	Foam or Jelly	.	.	.	.	.	.	.	.	.	.	.	X	X	X	.

Similar Variables with Different names

IPUMS DHS	IPUMS MICS	IPUMS PMA
FPMETHNOW	CPNOW	FPCURRUSE
0 = Not using	0 = No	0 = No
101 = Pill	1 = Yes	1 = Yes
102 = IUD		
Etc.		

Before merging files between projects:

Create variables with common names and codes

Global Health variables

- Renaming and recoding done for you
- Have a “_GH” suffix
- Minimal comparability issues and limited universe difficulties

_GH	IPUMS DHS	IPUMS MICS	IPUMS PMA
FPNOW_GH	FPMETHNOW	CPNOW	FPCURRUSE
0 = No	0 = Not using	0 = No	0 = No
1 = Yes	101 = Pill	1 = Yes	1 = Yes
1 = Yes	102 = IUD		
1 = Yes	Etc.		

Women

Demographics

Age of woman	AGE_GH
Marital status	MARST_GH
Age of partner/husband	PARTNERAGE_GH

Fertility & Family Planning

Currently pregnant	PREGNANT_GH
Number of children ever born	CHEB_GH
Currently using family planning	FPCURRUSE_GH

Domestic Violence Attitudes

(Justifiable to beat a wife because she...)

Goes out without telling husband	DVAGOOOUT_GH
Neglects the children	DVNEGLECTS_GH
Argues with husband	DVAARGUES_GH
Refuses sex with husband	DVAREFUSESEX_GH
Burns the food	DVABURNFOOD_GH

Media & Information Technology

Woman owns a mobile phone	MOBILEWM_GH
Frequency of reading newspaper	NEWSFREQ_GH
Frequency of watching television	TVFREQ_GH

Household variables

Household Characteristics

Material of walls	WALLS_GH
Material of roof	ROOF_GH
Type of cooking fuel	COOKFUEL_GH
Type of toilet	TOILET_GH
Material of floor	FLOOR_GH

For more information see our User Note
<https://www.idhsdata.org/idhs/interop.shtml>

Household Assets

HH has mobile phone	MOBPHONE_GH
HH has internet	INTERNET_GH
HH has electricity	ELECTRC_GH
HH has car	CAR_GH
HH has radio	RADIO_GH
HH has television	TV_GH
HH has personal computer	PC_GH
HH has bicycle	BIKE_GH
HH has motorcycle	MOTORCYCLE_GH
HH has refrigerator	FRIDGE_GH
HH has a bank account	BANKACC_GH



FPCURRUSE_GH

ADD TO CART

SELECT SAMPLES

Currently using method of FP (IPUMS Global Health)

[Return to IPUMS Global Health variables list](#)

CODES	DESCRIPTION	COMPARABILITY	UNIVERSE	AVAILABILITY	QUESTIONNAIRE TEXT
-------	-------------	---------------	----------	--------------	--------------------

Description

FPCURRUSE_GH represents if the female respondent is using any method of family planning at the time of the survey.

This variable is consistently coded across the IPUMS Global Health projects from the project specific variables:

IPUMS DHS: [FPMETHNOW](#)

IPUMS MICS: [CPNOW](#)

IPUMS PMA: [FPCURRUSE](#)

Found on the Women unit of analysis (IPUMS MICS and IPUMS DHS) and the Family Planning-Person unit of analysis (IPUMS PMA).



FPCURRUSE_GH

ADD TO CART

SELECT SAMPLES

Currently using method of FP (IPUMS Global Health)

[Return to IPUMS Global Health variables list](#)

CODES

DESCRIPTION

COMPARABILITY

UNIVERSE

AVAILABILITY

QUESTIONNAIRE TEXT

Comparability

IPUMS PMA and IPUMS MICS both include variables that reflect the yes/no options as presented in this interoperable variable. The original IPUMS DHS variable FPMETHNOW is consolidated into "yes" or "no" for this variable to be comparable across projects.

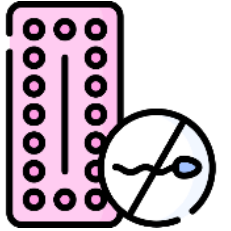
See the comparability sections and universe tab for each data collection in IPUMS Global Health for more information about country specific comparability issues.

Downloading and combining your
customized datasets

For each data project (DHS, MICS, PMA) ...

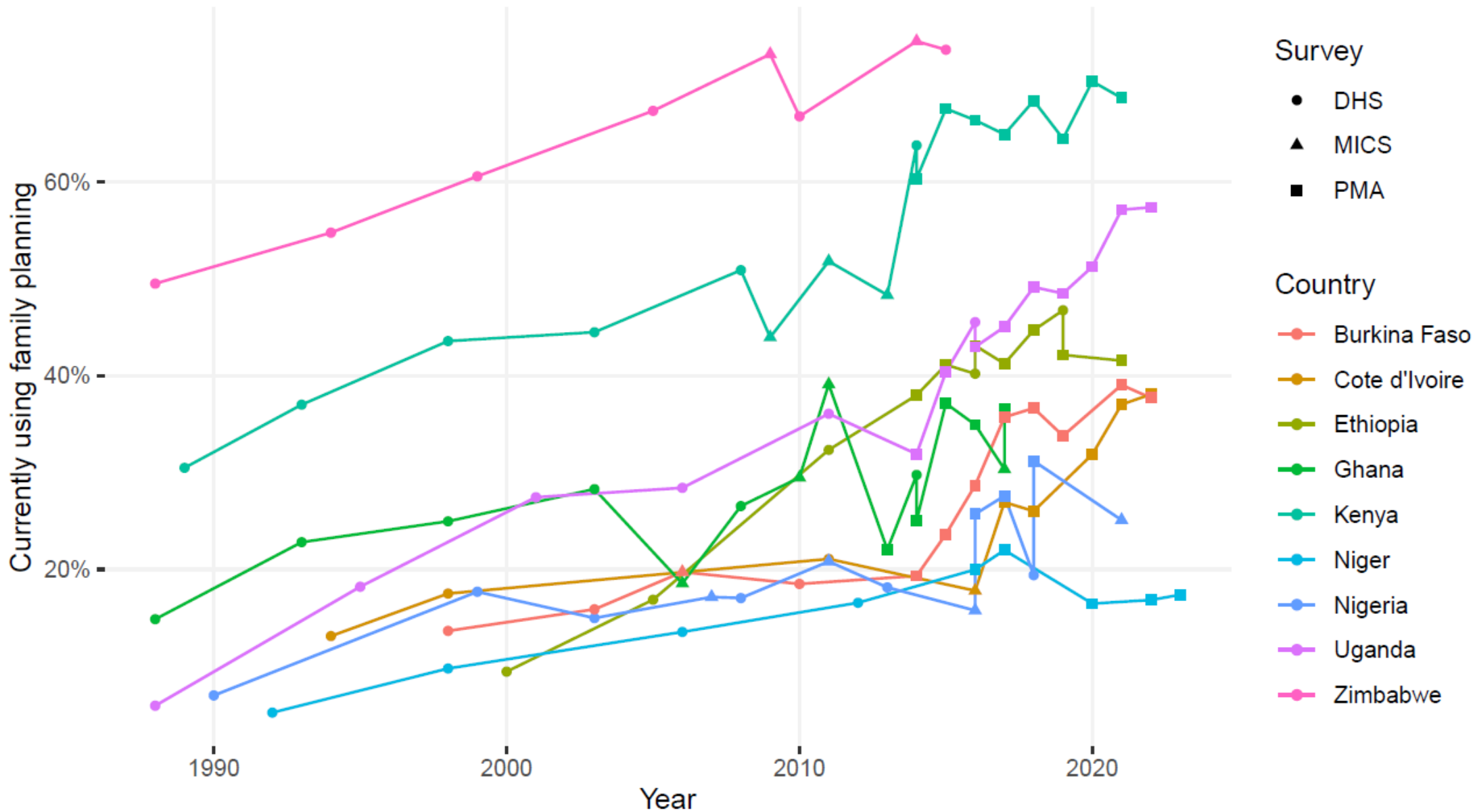
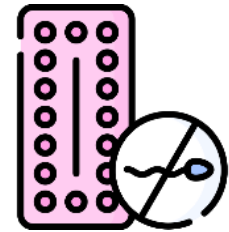
- Create customized data file (extract) for samples of interest
 - Make sure to register and log in
- Recode and rename variables
 - If GH variables ... great!
 - Other variables: Review metadata documentation
- Combining datasets together.
 - Data restructuring and appending
 - See User Note for example code

Example analysis

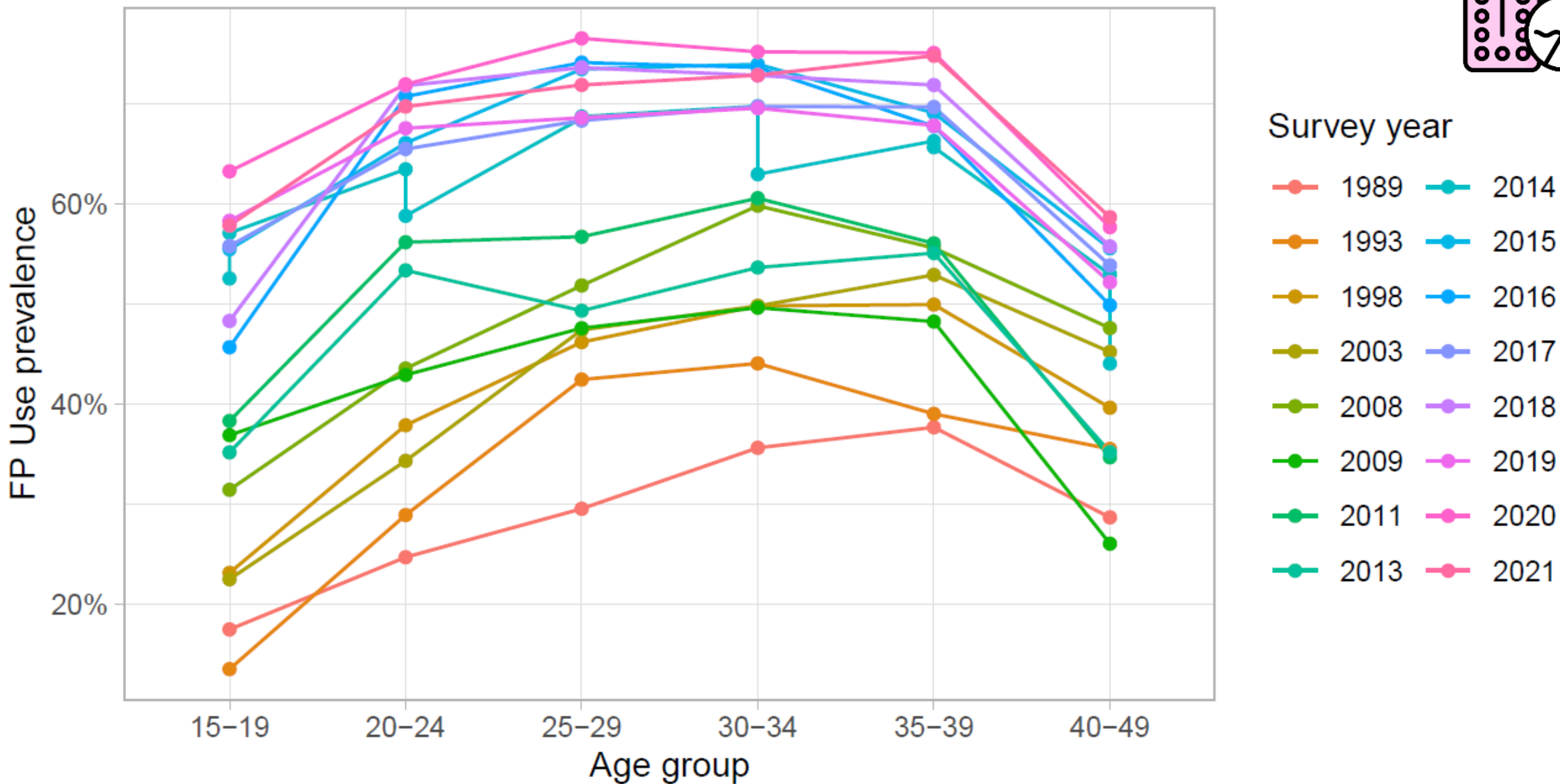
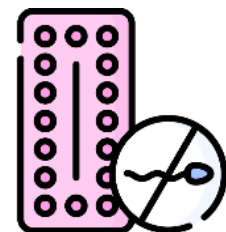


- What is the relationship between age, family planning use, and access to mobile phones or Internet?
 - Does this association differ across time and place?

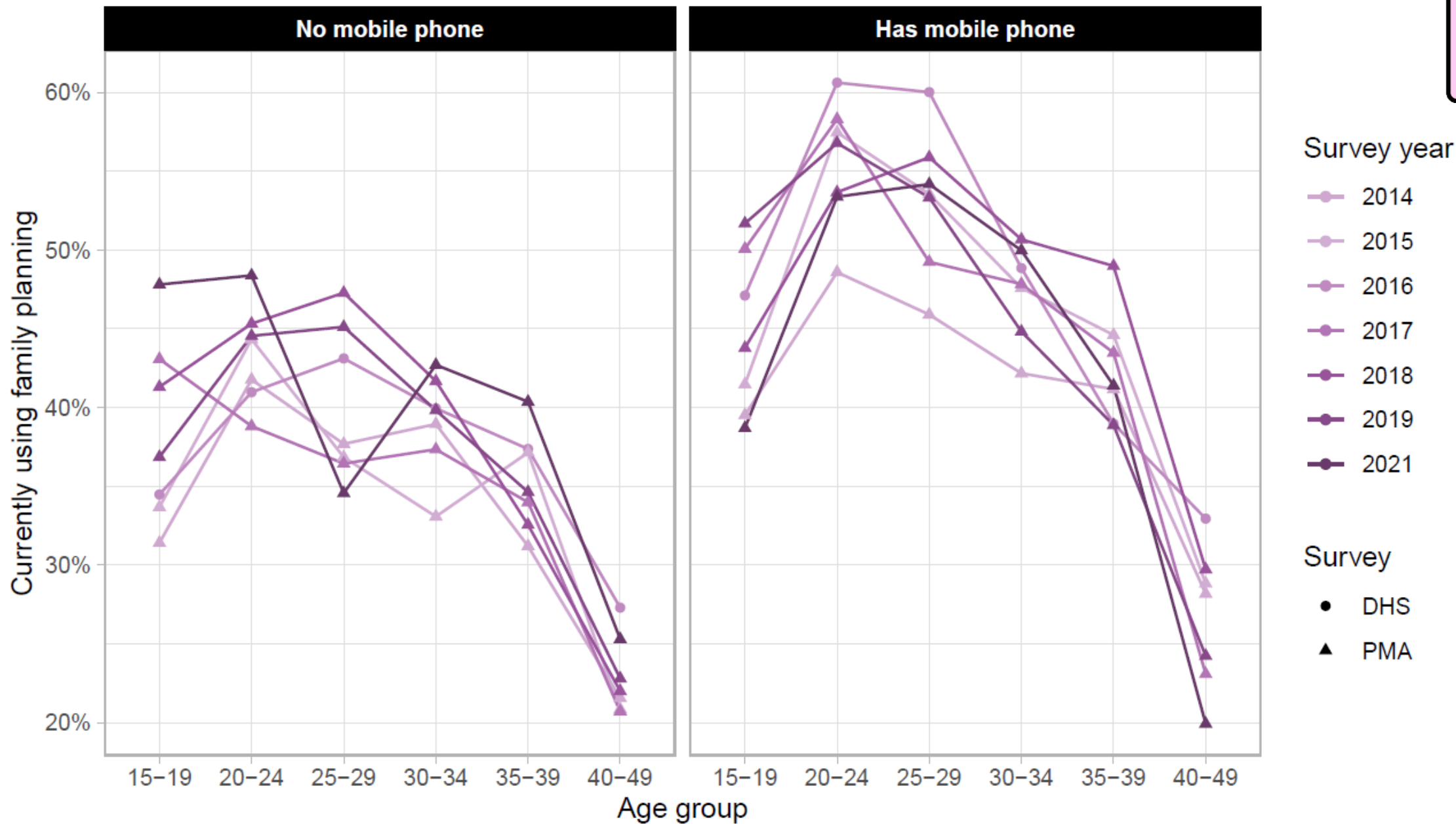
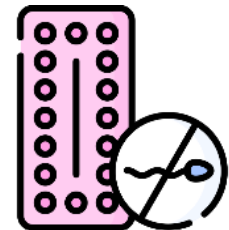
Percent of currently partnered women aged 15–49 using family planning in selected Sub-Saharan countries



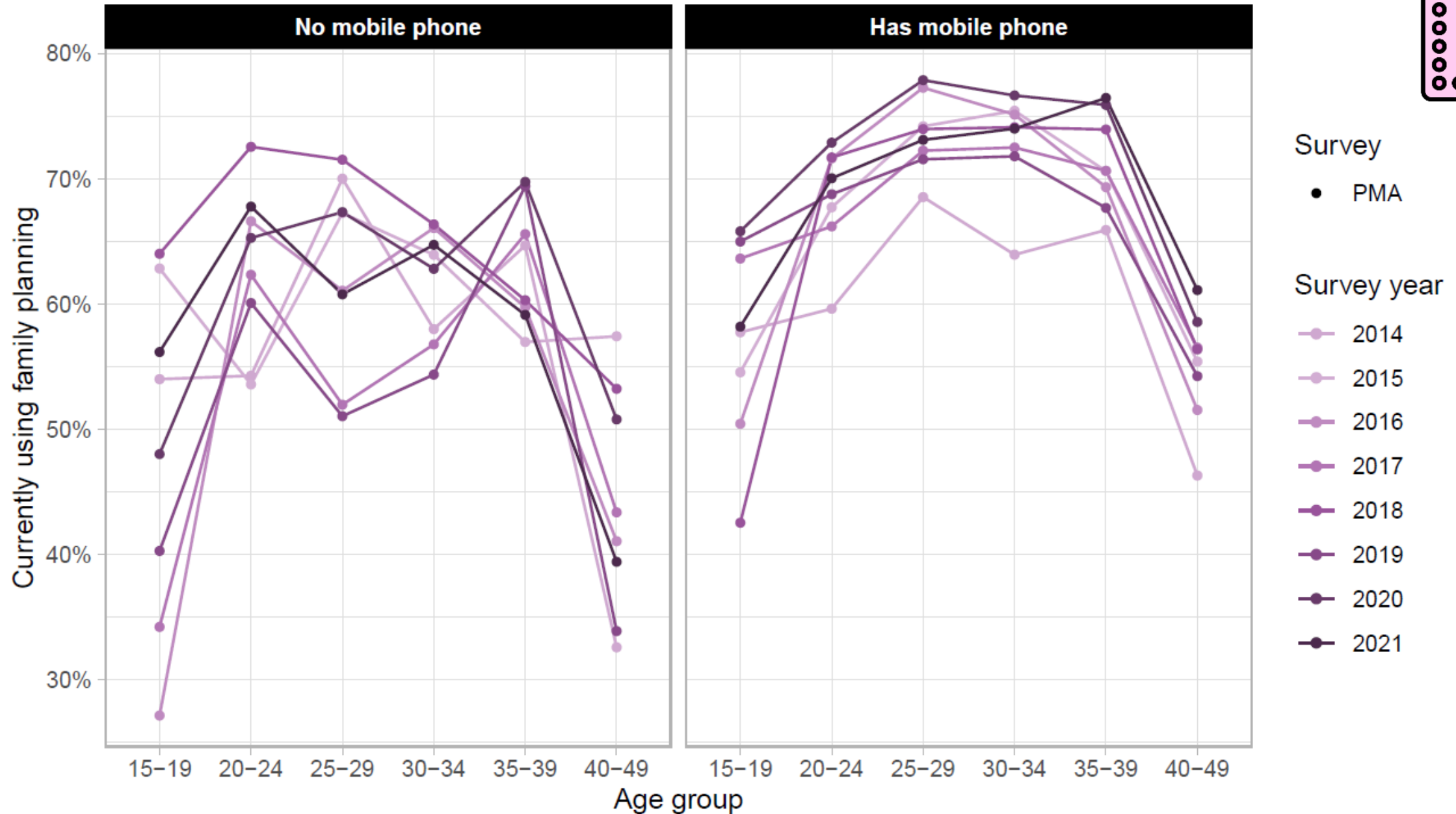
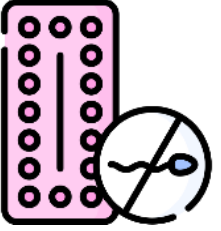
Percent of currently partnered women using family planning by age group in Kenya, 1989–2021



Percent of partnered women using family planning by age group and mobile phone ownership in Ethiopia



Percent of partnered women using family planning by age group and mobile phone ownership in Kenya



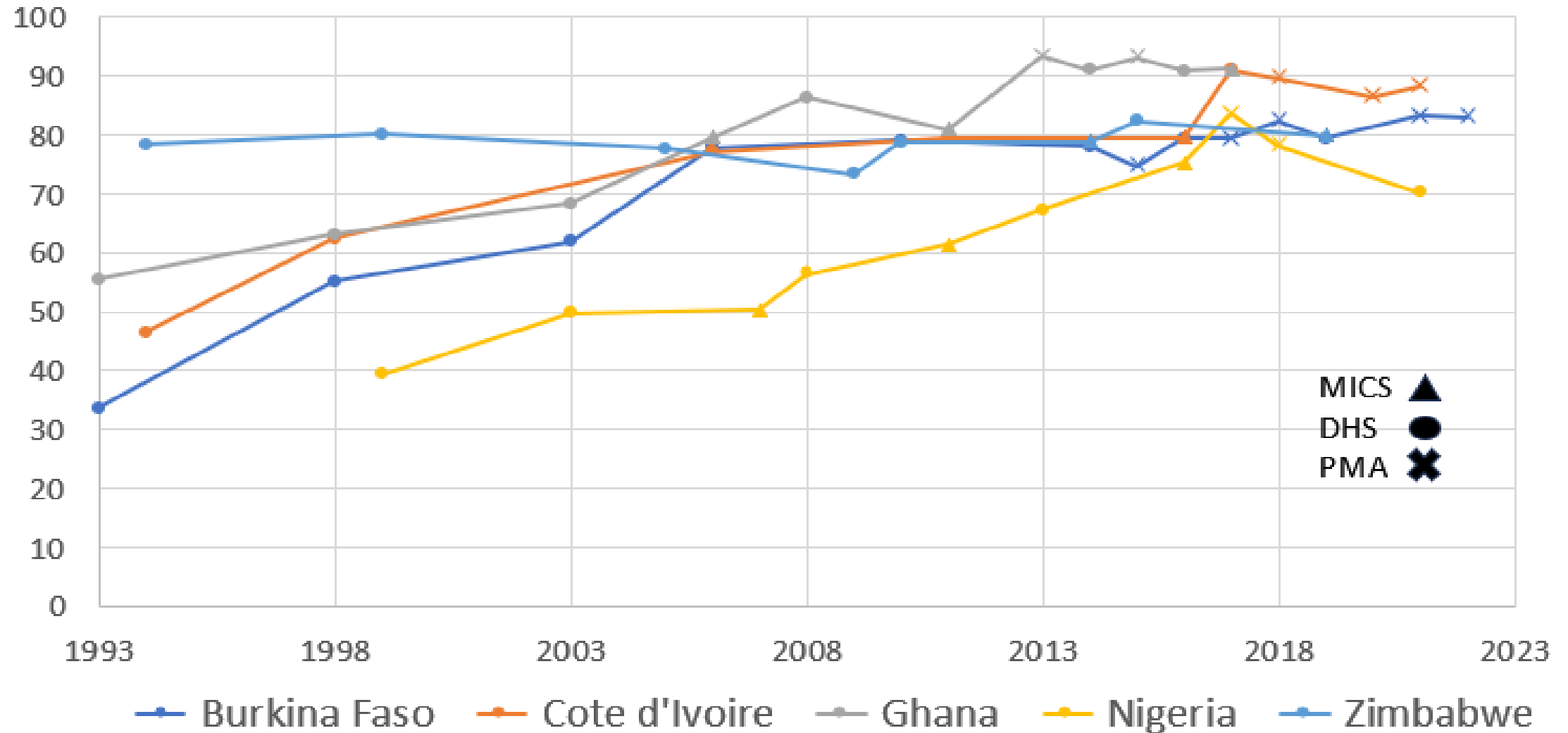
Other resources

- Individual project resources
 - Tutorials
 - Webinars
 - User Note on interoperability for each project
 - <https://www.idhsdata.org/idhs/interop.shtml>
- User support (email ipums@umn.edu)
- IPUMS User Forum
- IPUMS Global Github
 - <https://github.com/IPUMS-Global-Health>

Strengths and limitations

- Great for
 - Summary indicators such as measuring SDG across countries
 - National level statistics including trends over time
- More caution for pooled statistical analysis
 - Weights
 - Population sizes
 - Survey design differences

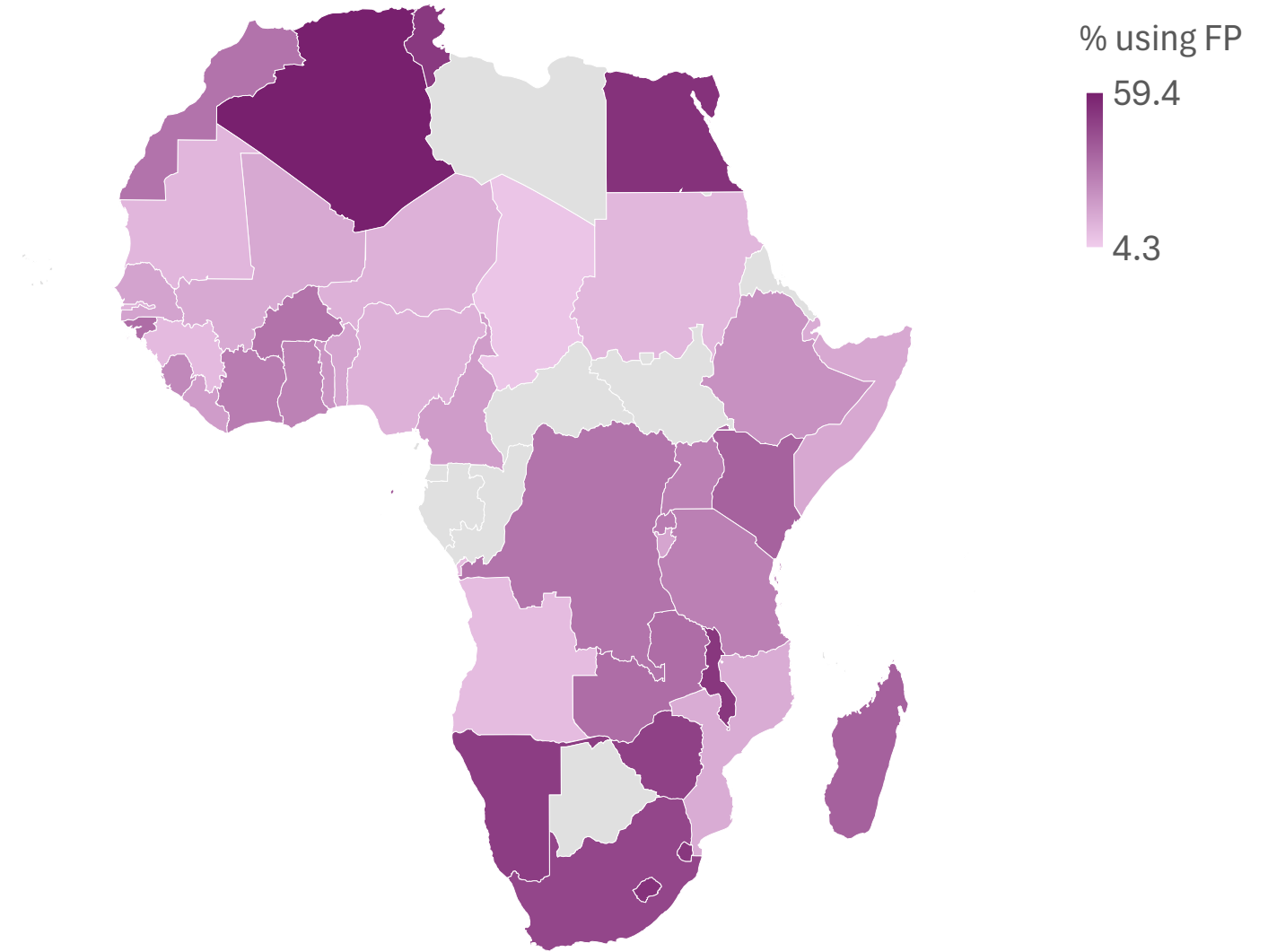
Percent of Households with Access to Water from Improved Source



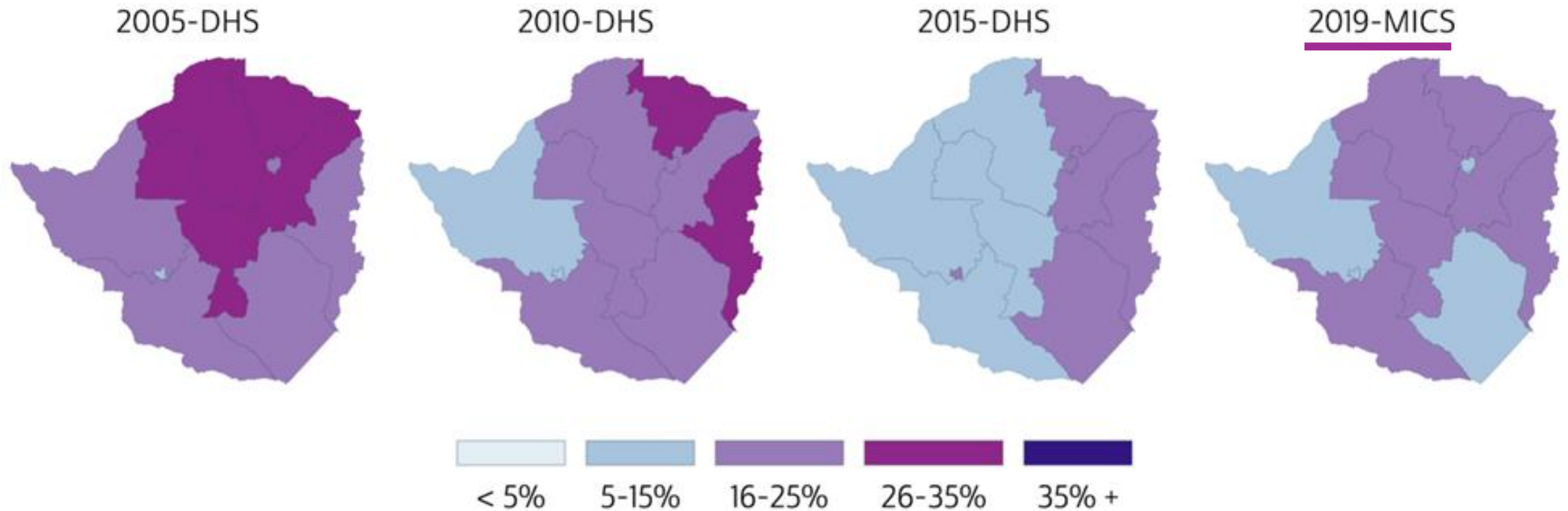
Percent of women using family planning method

at time of most recent survey

IPUMS DHS (fptypnow)
IPUMS MICS (cpnow)
IPUMS PMA (fpcurruse)



Prevalence of physical intimate partner violence experienced in the past 12 months by currently partnered women in Zimbabwe, 2005-2019



Collaborators: Devon Kristiansen (Lead); Maya Luetke; Matt Gunther; Miriam King; Mehr Munir

Next Steps

- Create more Global Health variables
- Publish geographic cross-walks
- Create new training guides for
 - Combining data across survey types
 - Technical and example code

And other ideas suggested by users

Thank you for joining us!

User Support: ipums@umn.edu