



IPUMS Overview

Microdata

Value added for research

Data usage

Policy example – World Health Organization

Health workforce measurement (census microdata)

Policy implications

Published work



PROJECT

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DATA

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HARMONIZED INTERNATIONAL CENSUS DATA FOR SOCIAL SCIENCE AND HEALTH RESEARCH

IPUMS-International is dedicated to collecting and distributing census data from around the world. The project goals are to collect and preserve data and documentation, harmonize data, and disseminate the harmonized data free of charge.

98 COUNTRIES – 443 CENSUSES AND SURVEYS – OVER 1 BILLION PERSON RECORDS

***SOURCE DATA FOR IPUMS-INTERNATIONAL ARE GENEROUSLY PROVIDED BY PARTICIPATING
NATIONAL STATISTICAL OFFICES***

[CREATE AN EXTRACT](#)[Browse Data](#)[CREATE AN ACCOUNT](#)[Register](#)

Published results: aggregate data

Ensemble des deux milieux	Ensemble des deux sexes																				
	Population légale	Population municipale	État matrimonial				Âge moyen au premier mariage	Taux d'analphabétisme	Population alphabétisée de 10 ans et plus selon les langues lues et écrites				Niveau d'études						Population selon l'activité		Taux net d'activité
			Célibataire	Marié	Divorcé	Veuf			Arabe seule	Arabe et français seules	Arabe, français et anglais	Autres	Néant	Préscolaire	Primaire	Secondaire collégial	Secondaire qualifiant	Supérieur	Population Active	Population Inactive	
Subdivisions administratives du Royaume																					
Total Royaume du Maroc	33,848,242	33,610,084	53.2	41.4	1.6	3.9	28.5	32.2	30.9	45.4	18.4	5.2	36.9	4.7	28.0	14.3	10.0	6.1	11,548,464	22,061,620	47.6
Tanger-Tetouan-Al Hoceima	3,556,729	3,540,012	56.1	39.4	1.1	3.3	29.3	31.0	40.0	40.1	12.5	7.4	36.1	8.0	28.7	14.0	8.2	5.0	1,307,532	2,232,480	51.1
Province: Al Hoceima	399,654	397,708	59.6	36.3	0.7	3.3	31.6	39.3	38.2	36.6	9.8	15.3	43.8	5.5	29.6	11.4	5.9	3.8	139,116	258,592	47.6
Al Hoceima (Mun.)	56,716	55,557	55.2	39.1	1.4	4.3	32.4	23.3	23.2	36.6	18.5	21.7	28.0	4.6	25.2	16.7	14.4	11.2	21,342	34,215	49.2
Bni Bouagach (Mun.)	18,271	18,266	58.0	37.5	0.7	3.8	32.3	33.7	28.5	37.4	13.0	21.1	39.2	5.0	26.5	15.2	8.4	5.6	5,452	12,814	40.0
Imzouren (Mun.)	33,852	33,493	57.1	38.0	1.0	3.8	31.7	30.4	23.9	25.5	9.9	40.7	36.4	5.5	27.9	15.2	9.2	5.7	10,844	22,649	43.0
Targuist (Mun.)	13,390	13,384	57.3	38.5	1.2	3.0	30.1	25.7	29.6	44.1	21.2	5.1	33.7	5.5	27.7	15.6	9.7	7.8	4,456	8,928	46.4
Ajdir (Mun.)	5,314	5,314	55.3	38.9	1.2	4.6	32.9	27.2	25.7	43.5	18.4	12.4	31.3	4.0	29.9	16.1	11.4	7.3	1,884	3,430	45.8
Cercle : Bni Boufrah	37,935	37,927	62.4	34.2	0.4	3.1	32.4	47.5	50.4	41.3	7.1	1.2	50.3	6.6	31.0	7.9	2.8	1.4	13,090	24,837	47.1
Bni Boufrah	9,653	9,653	59.7	36.3	0.4	3.6	33.4	43.2	41.3	44.7	12.7	1.2	46.2	6.5	29.0	10.4	5.1	2.8	3,377	6,276	45.9
Bni Gmil	9,513	9,505	64.4	32.8	0.3	2.5	32.1	49.1	48.9	44.4	5.8	0.9	52.3	5.0	32.6	6.6	2.5	1.1	3,567	5,938	52.3
Bni Gmil Maksoulne	9,593	9,593	65.2	32.0	0.3	2.6	31.7	47.9	66.7	30.0	2.1	1.2	50.7	11.8	30.1	5.7	1.3	0.5	3,260	6,333	48.6
Senada	9,176	9,176	60.1	35.9	0.6	3.5	32.4	50.1	45.9	46.0	6.8	1.3	52.2	3.1	32.3	8.7	2.4	1.3	2,886	6,290	42.1
Cercle : Bni Ouriaghel	85,956	85,590	59.4	36.3	0.5	3.8	33.3	47.2	34.5	32.9	6.3	26.3	49.9	3.1	30.3	10.2	4.4	2.2	27,771	57,819	42.8
Ait Kamra	7,685	7,343	56.7	39.0	0.6	3.7	32.0	44.6	36.7	49.0	10.1	4.2	49.0	1.9	28.5	11.9	6.1	2.5	2,171	5,172	39.1
Ait Youssef Ou Ali	12,673	12,673	58.7	36.4	0.7	4.2	34.4	37.1	38.2	28.8	5.7	27.2	40.6	3.0	31.3	13.5	7.7	3.9	4,241	8,432	43.1

RGPH 2014
Morocco

Published results: aggregate data

جدول 1.3: توزيع السكان حسب فئة السكان والجنس والجنسية والتقسيمات الإدارية والحضر والريف
Table 3.1: Distribution of Population by Population Category, Sex, Nationality, Administrative Divisions and Urban/ Rural

Administrative Divisions & Urban/ Rural	Population Category, Sex & Nationality									فئة السكان والجنس والجنسية			التقسيمات الإدارية والحضر/ الريف	
	الأردنيون خارج الأردن Jordanians Abroad			Population Inside Jordan						المجموع Total				
				السكان داخل الأردن			أردني							
	أنثى Female	ذكر Male	المجموع Total	أنثى Female	ذكر Male	المجموع Total	أنثى Female	ذكر Male	المجموع Total	أنثى Female	ذكر Male	المجموع Total		
Jordan														الأردن
Urban	8252	24961	33213	1198818	1603848	2802666	2842309	2933135	5775444	4049379	4561944	8611323	حضر	
Rural	335	1403	1738	40525	74934	115459	394649	408543	803192	435509	484880	920389	ريف	
Total	8587	26364	34951	1239343	1678782	2918125	3236958	3341678	6578636	4484888	5046824	9531712	المجموع	
Amman														العاصمة
Urban	5249	13580	18829	591974	843099	1435073	1207539	1234550	2442089	1804762	2091229	3895991	حضر	
Rural	61	221	282	4844	12686	17530	46291	47432	93723	51196	60339	111535	ريف	
Total	5310	13801	19111	596818	855785	1452603	1253830	1281982	2535812	1855958	2151568	4007526	المجموع	
Amman Qasabah District														لواء قصبة عمان
Urban	933	2139	3072	146511	202732	349243	248865	254775	503640	396309	459646	855955	حضر	
Total	933	2139	3072	146511	202732	349243	248865	254775	503640	396309	459646	855955	المجموع	
Amman Sub-District														قضاء عمان
Urban	933	2139	3072	146511	202732	349243	248865	254775	503640	396309	459646	855955	حضر	
Total	933	2139	3072	146511	202732	349243	248865	254775	503640	396309	459646	855955	المجموع	
Marka District														لواء ماركا
Urban	1026	2882	3908	124510	160734	285244	328836	338116	666952	454372	501732	956104	حضر	
Total	1026	2882	3908	124510	160734	285244	328836	338116	666952	454372	501732	956104	المجموع	
Marka Sub-District														قضاء ماركا
Urban	1026	2882	3908	124510	160734	285244	328836	338116	666952	454372	501732	956104	حضر	
Total	1026	2882	3908	124510	160734	285244	328836	338116	666952	454372	501732	956104	المجموع	

Population and Housing Census 2015
Department of Statistics
Jordan

Microdata dissemination through IPUMS

IPUMS

- Persons organized into households
- High-density samples (often 10%)
- Full range of census characteristics
- Adds value

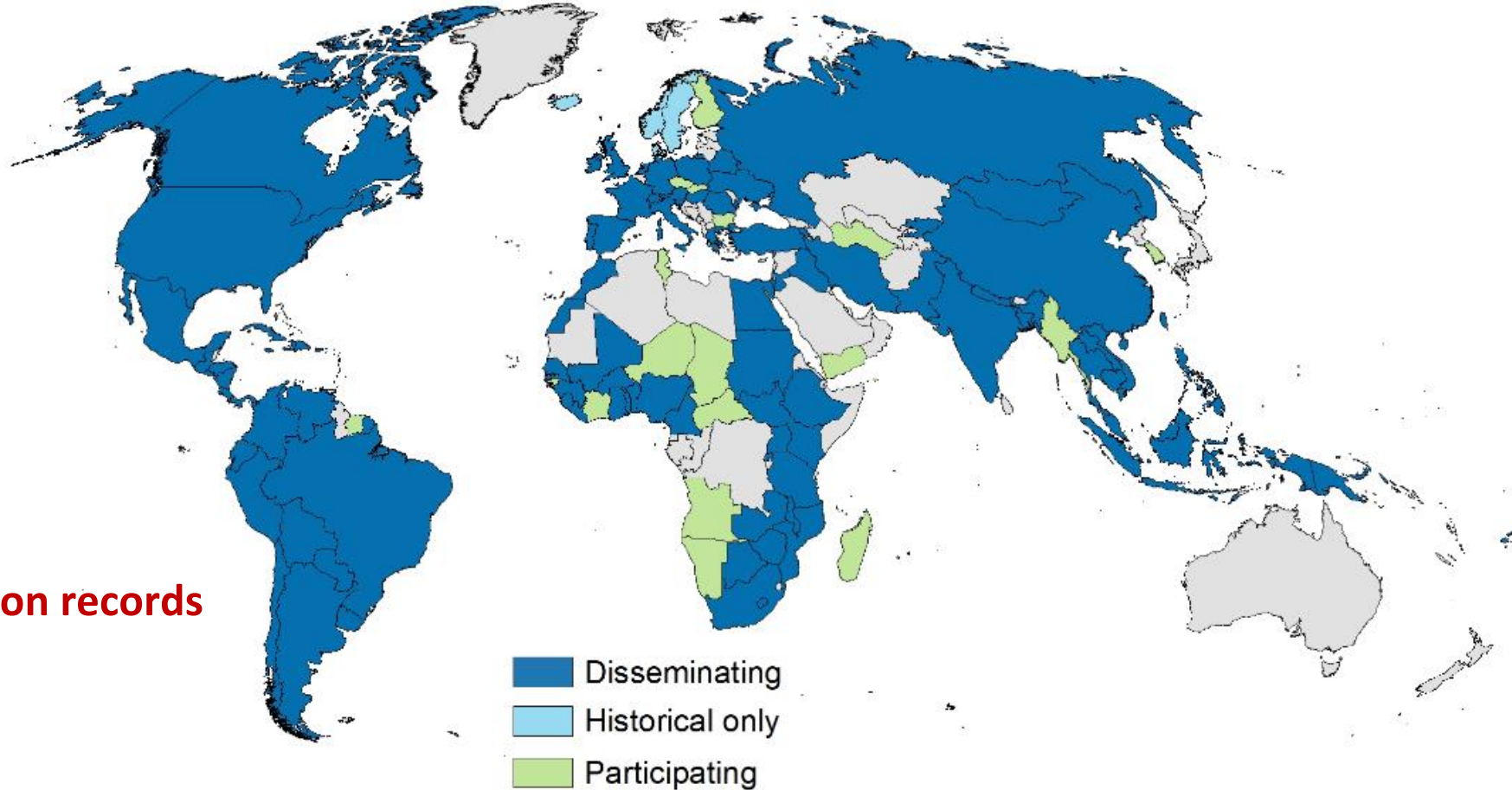
Microdata enable custom analysis for a scholarly audience of data users

- Custom disaggregation
- Study small populations
- Calculate indicators
- Complex analyses and modeling

Age	Sex	Educ	Occ
00110131207101111000254100001621210010100203100001001101004100000110010.			
001102272061012220210194100001333010010020203100001001101002100000400101.			
00110301101110311001001100001000010010101010101000010101010100001010010.			
00110418204105721001004002840000010010020210100001010020210100000310010.			
00210146210104120230253100001914110010020203100001001101002100000400301.			
0021021110311032100100300162000001001010101010100001010101010100001010010.			
00210317204105311001004002310000010010020210100001010020210100000110010.			
00310126206105121001005002630411110000020103041110403101004100000400010.			
00410177215102121000383100001000009910010210100001010020210100000210010.			
00410281215102721000333100001531010010020210100001003020210100000210010.			
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00610171215105121001003100001000000210010210100001010020210100000210010.			
00610276215105721001003100001743200110010203100001003101001100000210010.			
0061030810211072100100200119000001001010101010100001010101010100001010010.			
0061041210311072100100400231000001001010101010100001010101010100001010010.			
00710183215105121001003100001122810010020210100001002020208100000210010.			
00710224205105821001001100001913110010020203100001003101001100000400010.			
00810156212105120180203100001000000110010210100001010020310100000400501.			
00810226206105311001003100001712110010020210100001003021010071210110010.			
00810317204105311001003100001000010010020210100001010020210091510110010.			
0081041110311071100100300225000001001010101010100001010101010100001010010.			
00910185215105111001003100001744210010020207100001003101001100000110010.			

Microdata in IPUMS International

98 countries
443 data files
1 billion+ person records



Data provided by National Census offices, partners in the census integration and dissemination project

Standardize metadata: codebooks

	A	B	C	D	E	F	G	H	I	K	N	O	P	Q	R
1	Re	Var	Col	Wid	Frm	Value	Va	ValueLabel	Va	Freq	Svar	ValueSvar	Va	ValueLabelSvar	UnivSvar
3160						9		Unknown		13,202			8	Unknown	
3161						B		NA		32,533			9	NIU (not in universe)	
3162	P	mortfat	81	1				Father alive	P13		MZ2007A_0429			Father alive	All residents [discrepancies: non
3163						1		Yes		1,351,153			1	Yes	
3164						2		No		644,213			2	No	
3165						3		Not sure		6,824			3	Not sure	
3166						9		Unknown		12,325			8	Unknown	
3167						B		NA		32,533			9	NIU (not in universe)	
3168	P	civilreg	82	1				Registered with civil registry	P14		MZ2007A_0430			Registered with civil registry	Residents age 1-17 [discrepancie
3169						1		Yes		406,282			1	Yes	
3170						2		No		579,633			2	No	
3171						B		NA		1,061,133			8	Unknown	
3172						*							9	NIU (not in universe)	
3173	P	whynot	83	1				Reason not registered	P15		MZ2007A_0431			Reason not registered	Unregistered residents age 1-17
3174						1		Far away		147,290			1	Far away	
3175						2		Not important		9,919			2	Not important	
3176						3		Lack of knowledge		143,410			3	Lack of knowledge	
3177						4		It is complicated		31,207			4	It is complicated	
3178						5		It is expensive		135,455			5	It is expensive	
3179						6		Other		112,352			6	Other	
3180						B		NA		1,467,415			9	NIU (not in universe)	
3181	P	prov1	84	2				Province of residence	P16A		MZ2007A_0432			Province of residence 1 year ago	Residents age 1+ [discrepancies
3182						1		Niassa		109,673			1	Niassa	
3183						2		Cabo Delgado		154,277			2	Cabo Delgado	
3184						3		Nampula		381,336			3	Nampula	
3185						4		Zambezia		366,877			4	Zambezia	
3186						5		Tete		169,172			5	Tete	
3187						6		Manica		133,088			6	Manica	
3188						7		Sofala		157,650			7	Sofala	
3189						8		Inhambane		120,356			8	Inhambane	
3190						9		Gaza		113,341			9	Gaza	
3191						10		Maputo Provincia		109,613			10	Maputo province	
3192						11		Maputo Cidade		109,346			11	Maputo city	
3193						*							97	Abroad	
3194						99		Descon		11,900			98	Unknown	
3195						0		[no label]		36			98	"	
3196						BB		[no label]		110,383			99	NIU (not in universe)	

Internal codebook
for metadata-driven
data transformations

Deliver to users
Basic codebook and
DDI Codebook
with every data extract

Standardize metadata: documentation

The collage includes several census forms:

- US Census (Person 1):** Questions about name, sex, date of birth, and race.
- Hungarian Lakaskérdőív:** Questions about the number of rooms, access to water, and running water.
- Spanish Form 11:** Questions about the number of children and women.
- Spanish Form 12:** Questions about the number of children and women.

5. Number of Rooms

How many rooms are used for sleeping without counting hallways?
_____ Write the number

Without counting the hallways or bathrooms how many total rooms are in this dwelling? Count the kitchen
_____ Write the number

6. Access to water

Read all of the options until you get an affirmative answer.
Circle only one answer

- 1 Running water inside the dwelling
- 2 Running water outside the dwelling but on the land
- 3 Running water from a public faucet or hydrant
- 4 Running water that is carried from another dwelling
- 5 Tanked in by truck
- 6 Water from a well, river, lake, stream or other

Answers 3, 4, 5, 6 continue with number 8

7. Water supply

How many days of the week is water available?
Circle only one answer

- 1 Daily
- 2 Every third day
- 3 Twice a week
- 4 Once a week
- 5 Occasionally

IPUMS INTERNATIONAL

DATA CART
YOUR DATA EXTRACT
0 VARIABLES
11 SAMPLES
VIEW CART

HOME | SELECT DATA | MY DATA | FAQ | HELP

ROOMS

Number of rooms
Group: [Dwelling Characteristics — HOUSEHOLD](#)

CODES	DESCRIPTION	COMPARABILITY	UNIVERSE	AVAILABILITY	QUESTIONNAIRE TEXT	SOURCE
Comparability — Index						
GENERAL		Cambodia		Palestine		
Armenia		France		Rwanda		
Brazil		Morocco		South Africa		
Comparability — General						
The censuses generally agree on the broad definition of a "room": essentially an interior area or compartment of a dwelling defined by walls and a roof, excluding corridors or hallways. They differ considerably, however, in delineating which rooms are to be included in the tally and which are to be excluded. Points of difference include: kitchens; bathrooms; garages; kitchens or bathrooms shared by multiple households; rooms used for various commercial or non-residential purposes; etc. See the enumeration text for details.						

Variable harmonization: Marital Status

IPUMS International data users and usage

Data Users: Institutional Affiliation

North America

- *University of Minnesota
- *University of California, Berkeley
- *Harvard University
- *University of Michigan
- *University of Chicago
- *Columbia University
- *Dartmouth College
- *University of California, Davis

Asia & Oceania

- *National University of Singapore
- Australian National University
- Xiamen University, China
- HKUST

Europe

- *London School of Economics
- *Universidad Carlos III de Madrid
- *University of Oxford
- *University College London

Central and South America

- *Universidade Federal de Minas Gerais, Brazil
- El Colegio de México
- Universidad de Valle, Colombia
- Pontificia Universidad Católica de Chile

Africa

- *University of Witwatersrand, South Africa
- Obafemi Awolowo University, Nigeria
- University of Cape Town, South Africa
- Makerere University, Uganda

International Organizations

- *The World Bank
- *United Nations (UNPD, UNFPA, UNESCO)
- Inter-American Development Bank
- World Health Organization

Since 2005

- > 20,000 approved data users
verified and credible
academic or policy affiliation
- > 80,000 data download requests

Discipline

Economics	50%
Demography	15%
Sociology	10%
Statistics	5%
Public Policy	5%
Geography	3.5%
History	1.5%
Other	10%



IPUMS Overview

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Policy example – World Health Organization

Health workforce measurement (census microdata)

Policy implications

Published work

WHO example: measuring the health workforce

National Health Workforce Accounts (NHWA): Definition

A **system** by which countries **progressively** improve the **availability, quality, and use** of data on health workforce through **monitoring of a set of indicators** to support achievement of Universal Health Coverage, SDGs and other health objectives.

Documentation and tools available here:
www.who.int/hrh/statistics/nhwa/

WHO examples shared courtesy of Dr. Mathieu Boniol
Presentation for IPUMS International Pre-conference Workshop
ISI World Statistics Congress, Kuala Lumpur
August 18, 2019



WHO example: Human Resources for Health data

Strengths and limitations of HRH data sources

Attribute	Census	Labour Force Surveys	Health Facility Surveys	Routine administrative Sources (payrolls, HRH registries)
<u>Complete count of health workforce</u>	***	*	**	**
<u>Across sectors coverage (public, private)</u>	***	***	*	**
<u>Disaggregated data (Age, Sex, Geographical)</u>	***	**	**	**
Capturing unemployment	*	***	-	*
<u>Rigorous data collection / management</u>	***	***	**	**
Periodicity and regular updating	*	**	**	**
Occupational data coding	*	**	**	**
<u>Sampling errors</u>	***	**	*	**
Tracking of workforce entry-to-exit	*	**	-	*
Tracking of in-service Training / Productivity)	-		***	*
<u>Accessibility to micro-data</u>	**	***	**	*
<u>Relative cost</u> – extended marginal value	*	**	***	**

Diallo, K. et al 2019

WHO example: occupations in the health workforce

Group code			Occupational title	Group code			Occupational title	Occupational information			
Sub	Minor	Unit		Sub	Minor	Unit					
22			Health professionals	32			Health associate professionals	ISCO International Classification at 3-digit or 4-digit level from IPUMS			
	221		Medical doctors		321		Medical and pharmaceutical technicians				
		2211	Generalist medical practitioners			3211	Medical imaging and therapeutic equipment technicians				
		2212	Specialist medical practitioners			3212	Medical and pathology laboratory technicians				
	222		Nursing and midwifery professionals			3213	Pharmaceutical technicians and assistants	Some info for 35 countries but detail at preferred level for only 14 countries			
		2221	Nursing professionals			3214	Medical and dental prosthetic and related technicians				
		2222	Midwifery professionals		322		Nursing and midwifery associate professionals				
	223		Traditional and complementary health practitioners			3221	Nursing associate professionals				
		2230	Traditional and complementary health practitioners			3222	Midwifery associate professionals	Group code			
	224		Paramedical practitioners		323		Traditional and complementary health practitioners	Sub	Minor	Unit	Occupational title
		2240	Paramedical practitioners			3230	Traditional and complementary health practitioners	53			Personal care workers
	226		Other health professionals		325		Other health associate professionals		532		Personal care workers in health services
		2261	Dentists			3251	Dental assistants and dental technicians			5321	Health care assistants
		2262	Pharmacists			3252	Medical records and health information management			5322	Home-based personal care workers
		2263	Environmental and occupational health professionals			3253	Community health workers			5329	Personal care workers in health services not elsewhere classified
		2264	Physiotherapists			3254	Dispensing opticians				Additional health-related unit groups
		2265	Dietitians and nutritionists			3255	Physiotherapy technicians			1342	Health service managers
		2266	Audiologists and speech therapists			3256	Medical assistants			1343	Aged care service managers
		2267	Optometrists and ophthalmic technicians			3257	Environmental and occupational health technicians			2634	Psychologists
		2269	Health professionals not elsewhere classified			3258	Ambulance workers			2635	Social work and counselling professionals
						3259	Health associate professionals			3344	Medical secretaries

WHO example: health workforce occupations

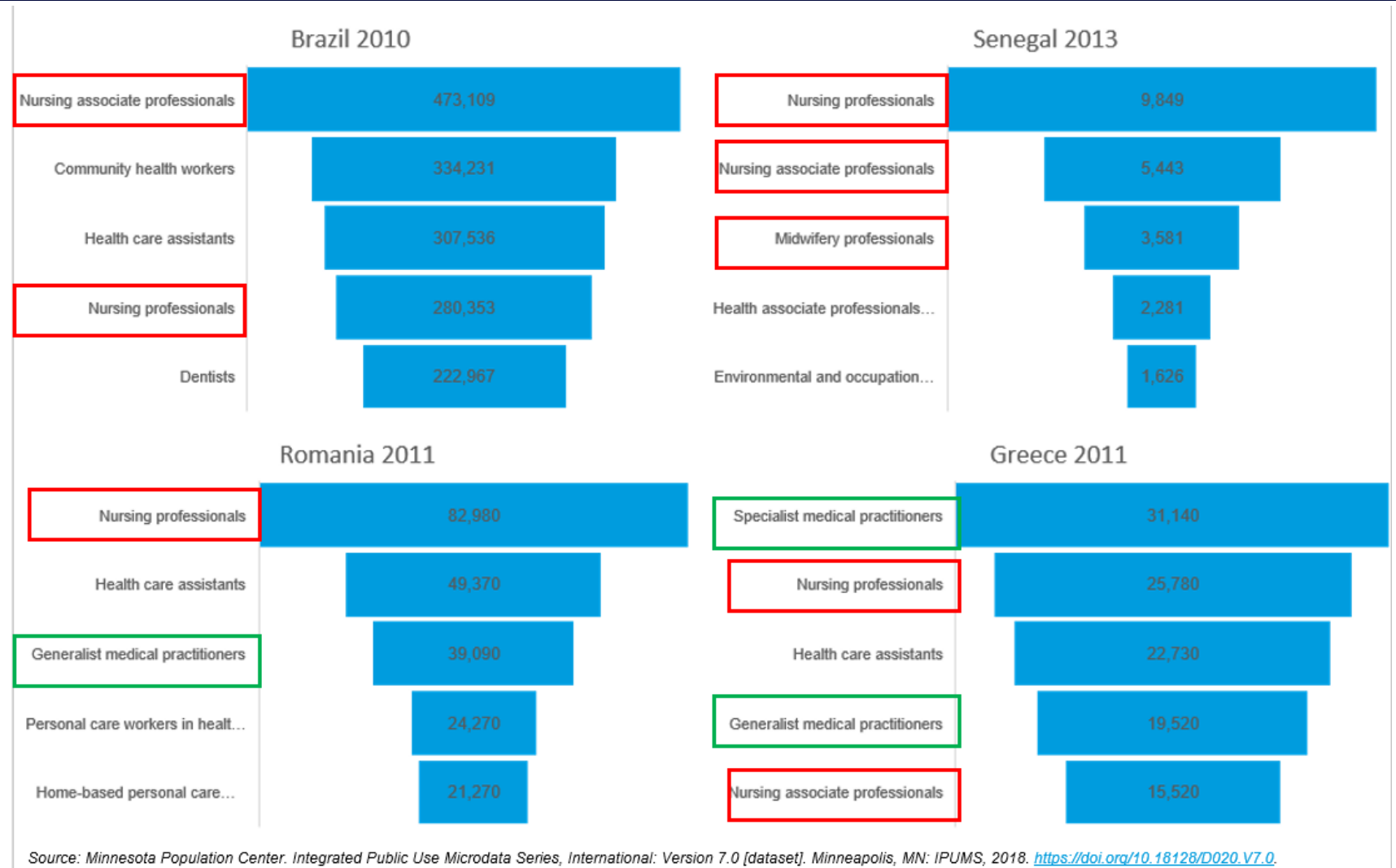
Use of census data

Top 5 health occupations for selected countries

Medical doctors

Nursing and midwifery personnel

Wide variability in medical professional availability and distribution

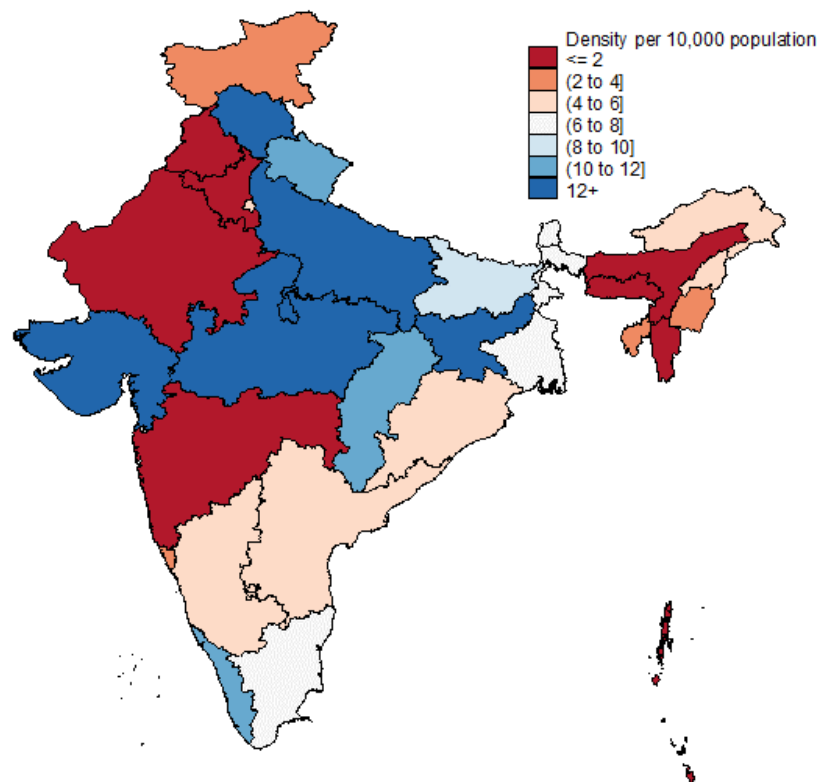


Source: Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. <https://doi.org/10.18128/D020.V7.0>.

WHO example: change in health workforce (India)

Density of Nursing and Midwifery personnel* in India 2004

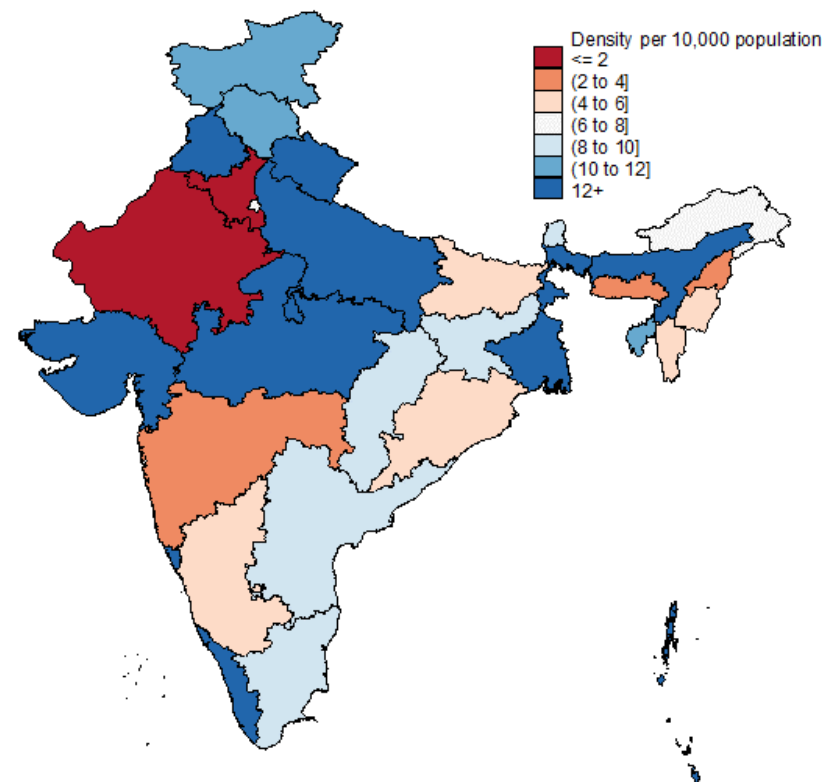
Employment survey, sample size 602,833



* Nurses, Midwives and health visitors

Density of Nursing and Midwifery personnel* in India 2009

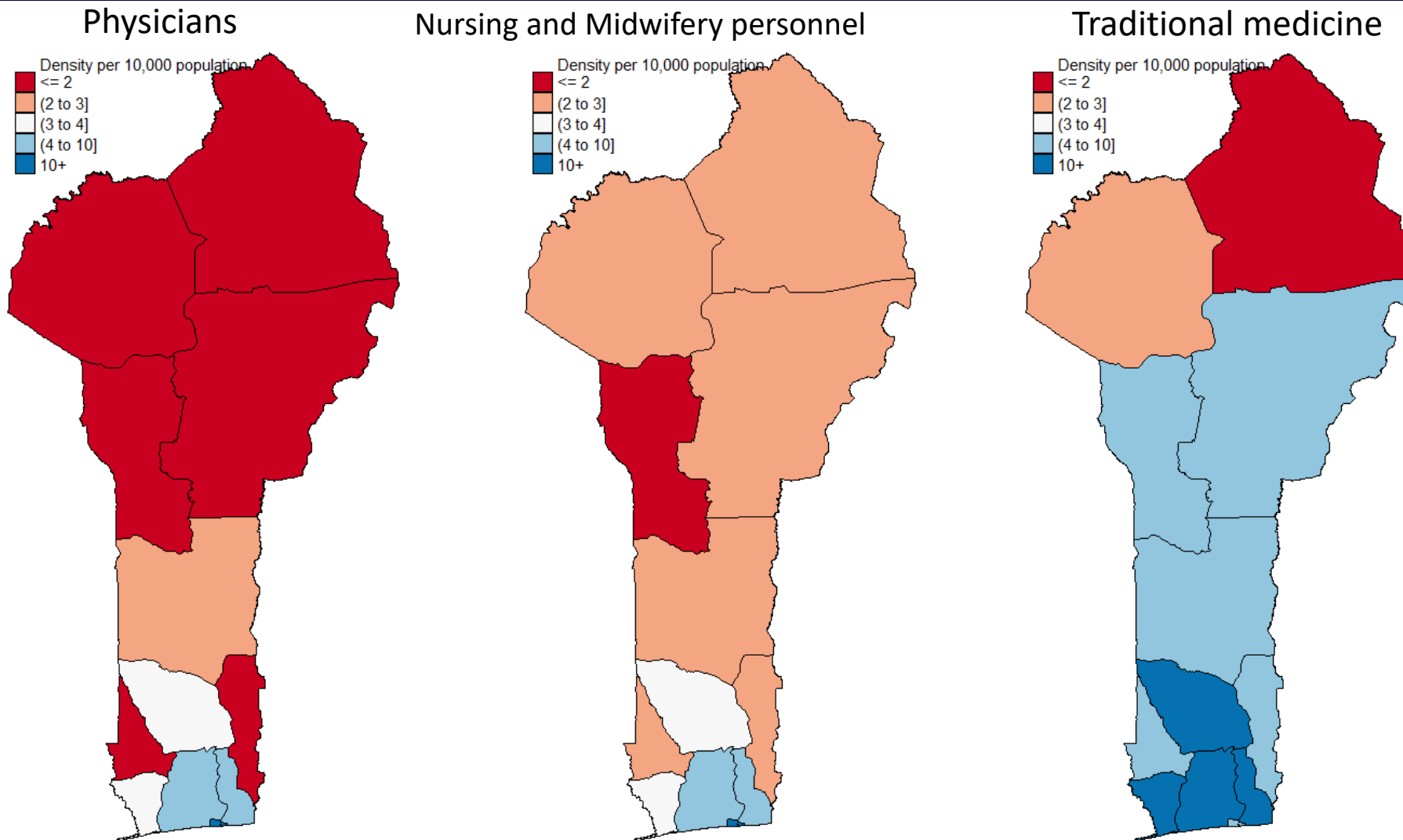
Census socio economic survey, sample size 560,741



* Professionals and associates

Source: Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018.
<https://doi.org/10.18128/D020.V7.0>. Data from the Ministry of Statistics and Programme Implementation, India

WHO example: health workforce distribution (Benin)



WHO example: policy directions



WHO call for strengthening HRH data

- Optimize existing workforce in pursuit of SDGs/universal coverage
- Future workforce requirements: anticipate and invest
- Strengthen individual and institutional capacity for management and implementation
- Strengthen data, evidence, and knowledge for cost-effective policy decisions

Realizing returns on the census investment

- High quality, professional data collection
- Microdata have enormous value for research and policy development
 - Custom disaggregation (especially demographic and geographic)
 - Study of small populations (preserve detailed codes)
 - Calculation of indicators
 - Policy research

Job skills-to-economy (WB, ILO)

Gender, racial, or ethnic equity (UNWomen & all)

Health workforce (WHO)

Population growth and dynamics (UNPD, UNFPA)

Migration (IOM)

Educational attainment (UNFPA & others)

etc.

*Countries disseminating data through IPUMS
meet international best-practice standards for microdata dissemination.*

Thank you!

cleveland@umn.edu

 @ipumsi