HOUSING AND NEIGHBORHOOD WORKING GROUP

Agenda for today

- Introductions
- Goals for working group (co-chairs: G. Adamkiewicz and Y. Long)
- Brief presentation – housing working group
- Next steps
  - Planning for upcoming calls
  - Other initiatives? Suggestions?

WORKING GROUP MEMBERS

First name	Last name	Affiliation	Professional title
Shakil	Ahmed	BRAC University	GIS analyst
Judith	Rodriguez	Harvard - School of Design/Public Health	Research Associate
Gary	Adamkiewicz	Harvard - School of Public Health	Assistant Professor
Alireza	Zolfaghari	Imperial College London	Research Associate
Beth	Solomon	Imperial College London	PhD student
James	Benett	Imperial College London	Statistical Manager
Majid	Ezzati	Imperial College London	Professor
Niloofar	Shoari	Imperial College London	Research Associate
Chris	Barrington-Leigh	McGill University	Associate Professor
Meghan	Winters	Simon Fraser University	Associate Professor
Xudong	Yang	Tsinghua University	Professor
Ying	Long	Tsinghua University	Professor
Emily	Gemmell	University of British Columbia	PhD student
Michael	Brauer	University of British Columbia	Professor
Kavi	Bhalla	University of Chicago	Assistant Professor
Manu	Murugesan	University of Chicago	Data Scientist
George	Owusu	University of Ghana	Professor

PATHWAYS TO EQUITABLE HEALTHY CITIES

Housing and Health

Housing and Neighbourhoods Working Group

11 July 2019

Gary Adamkiewicz, HSPH
Judith Rodriguez, HSPH
Bethlehem Solomon, Imperial

www.equitablehealthycities.org

HOUSING GROUP

Some key activities to date

- Review of literature
- Development of framework
- Data analysis
  - Accra census/living standards
  - London data

World Health Organization

"**Healthy housing is shelter that supports a state of complete physical, mental and social well-being**. Healthy housing provides a feeling of home, including a sense of **belonging, security and privacy**. Healthy housing also refers to the **physical structure** of the dwelling, and the **extent to which it enables physical health**, including by being structurally sound, by providing shelter from the elements and from excess moisture, and by facilitating comfortable temperatures, adequate sanitation and illumination, sufficient space, safe fuel or connection to electricity, and protection from pollutants, injury hazards, mould and pests. Whether housing is healthy also depends on factors outside its walls. It **depends on the local community**, which enables social interactions that support health and well-being. Finally, healthy housing relies on the immediate housing environment, and the extent to which this provides **access to services, green space, and active and public transport options**, as well as protection from waste, pollution and the effects of disaster, whether natural or man-made."

How to frame a health and housing strategy?

WHO Housing and health guidelines. Geneva: World Health Organization; 2018.
Bonnefoy X. Inadequate housing and health: an overview. International Journal of Environment & Pollution. 2007;30(3-4):411–29.

World Health Organization

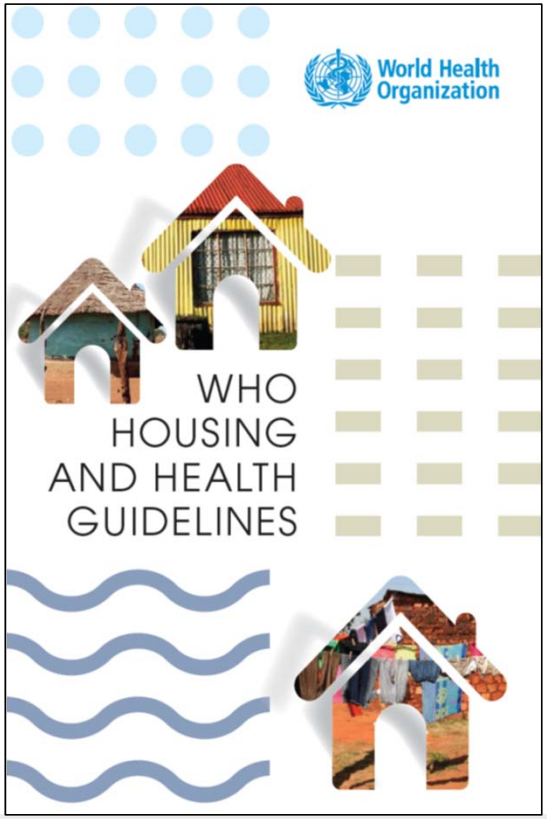

Table 1 Recommendations of the WHO Housing and health guidelines

Topic	Recommendation	Strength of recommendation
Crowding	Strategies should be developed and implemented to prevent and reduce household crowding.	Strong
Indoor cold and insulation	Indoor housing temperatures should be high enough to protect residents from the harmful health effects of cold. For countries with temperate or colder climates, 18 °C has been proposed as a safe and well-balanced indoor temperature to protect the health of general populations during cold seasons.	Strong
	In climate zones with a cold season, efficient and safe thermal insulation should be installed in new housing and retrofitted in existing housing.	Conditional
Indoor heat	In populations exposed to high ambient temperatures, strategies to protect populations from excess indoor heat should be developed and implemented.	Conditional
Home safety and injuries	Housing should be equipped with safety devices (such as smoke and carbon monoxide alarms, stair gates and window guards) and measures should be taken to reduce hazards that lead to unintentional injuries.	Strong
Accessibility	Based on the current and projected national prevalence of populations with functional impairments and taking into account trends of ageing, an adequate proportion of the housing stock should be accessible to people with functional impairments.	Strong

WHO Housing and health guidelines. Geneva: World Health Organization; 2018.
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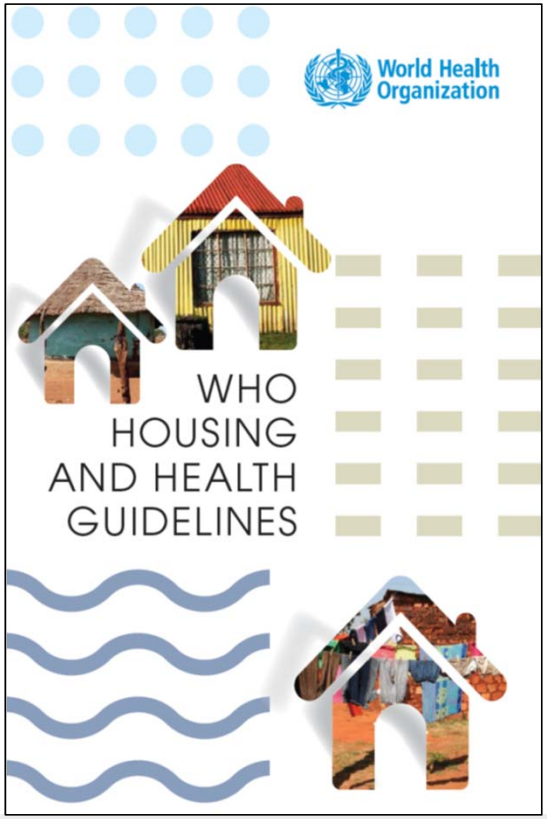
PATHWAYS TO EQUITABLE HEALTHY CITIES

World Health Organization



The 2018 report adds these recommendations to several previously-released WHO guidelines that are relevant to housing and indoor environments:

- water quality
- air quality
- tobacco smoke
- noise
- asbestos
- lead
- radon

WHO Housing and health guidelines. Geneva: World Health Organization; 2018.
Bonnefoy X. Inadequate housing and health: an overview. International Journal of Environment & Pollution. 2007;30(3-4):411–29.

PATHWAYS TO EQUITABLE HEALTHY CITIES

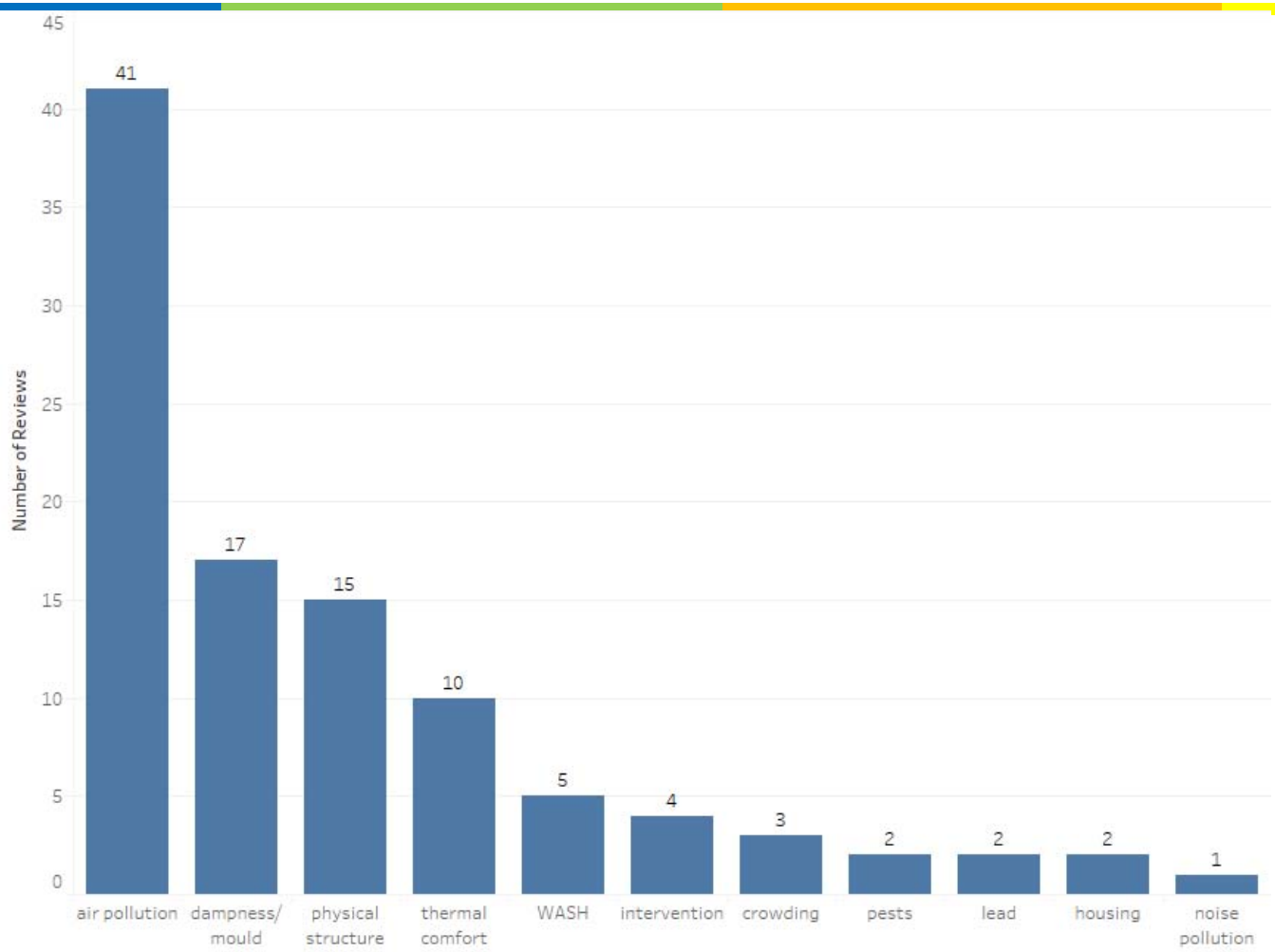
Issue	Key health effects
Household air pollution [pollutants from stoves using kerosene, biomass (wood, animal dung and crop waste) and coal]	Stroke, ischemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer. Close to half of deaths due to pneumonia among children under 5 years of age are caused by particulate matter (soot) inhaled from household air pollution. (WHO)
Environmental tobacco smoke	Cardiovascular and respiratory diseases, including coronary heart disease and lung cancer. In infants, ETS exposure raises the risk of sudden infant death syndrome. In pregnant women, it causes pregnancy complications and low birth weight. Second-hand smoke causes more than 1.2 million premature deaths per year, and 65,000 children die each year from illnesses attributable to second-hand smoke. (WHO)
Dampness and mold	Increased risk of respiratory symptoms, respiratory infections and exacerbation of asthma. Some evidence suggests increased risks of allergic rhinitis and asthma. Clinical evidence has shown that exposure to mould and other dampness-related microbial agents increases the risks of rare conditions, such as hypersensitivity pneumonitis, allergic alveolitis, chronic rhinosinusitis and allergic fungal sinusitis.
Lead exposure	Wide range of toxic effects. Based on 2015 data, lead exposure is estimated to account for 12.4% of the global burden of idiopathic intellectual disability, 2.5% of the global burden of IHD, 2.4% of the global burden of stroke, 4.4% of hypertensive heart disease, 0.8% of rheumatic heart disease and 1.4% of other cardiovascular diseases worldwide.
Overcrowding	Close-contact infectious diseases (e.g., tuberculosis (TB), flu-related hospitalizations and illnesses, pneumonia, acute respiratory illness, respiratory syncytial virus, gastroenteritis and diarrheal diseases, etc.)
Low indoor temperatures	Respiratory morbidity and mortality (e.g., studies show association with lung function in asthmatics and those with COPD); Cardiovascular morbidity and mortality (e.g., studies show association with blood pressure)
High indoor temperatures	All-cause mortality (outdoor temperature), heat stroke, hyperthermia, dehydration, hospital admission (cardiovascular and respiratory). Climate-specific results widely observed.
Injury hazards	Burns (home fires; smoke alarms); Injury in children (stair and safety gates; window guards)
Water quality (and poor sanitation)	Infectious disease (cholera, diarrhea illnesses, dysentery, hepatitis A, typhoid and polio); Pollutant-related disease (e.g., lead)

Review of literature reviews

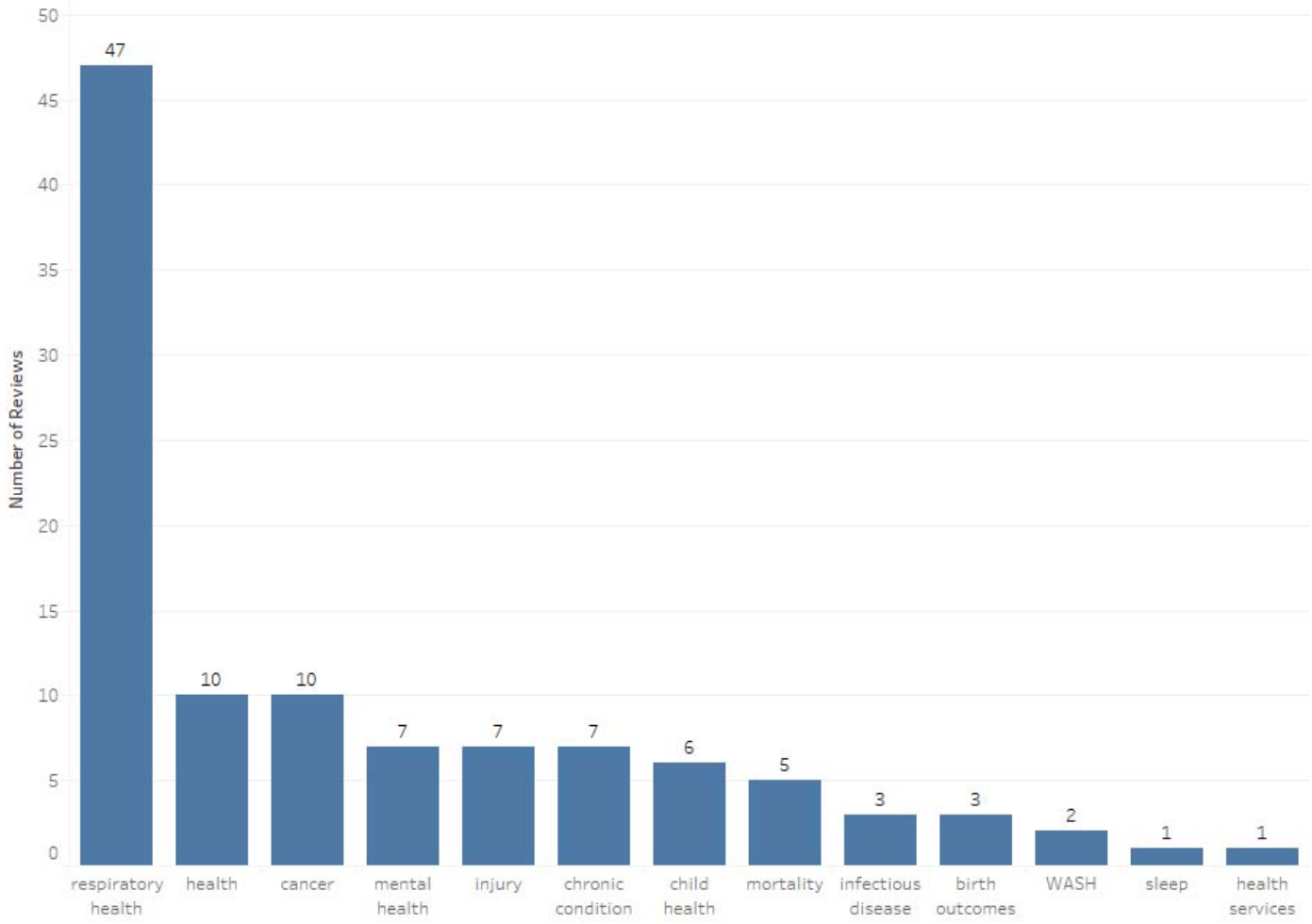
80+ existing housing quality – heath reviews

- Geography
  - 6 focused on LMIC
- Age
  - 15 focused on children/young adults
  - 3 focused on the elderly
- 3 focused on non-smokers
- 1 focused on refugee and asylum seekers

Housing quality areas among existing reviews



Health outcome areas among existing reviews



Typical Environmental Health Framework

NEIGHBORHOOD
Industry
Transportation
Greenspace
Food environment
Built environment

HOUSEHOLD/HOUSING
Location
Design and physical structure
Occupant density/activity
Systems
Infrastructure

While there is increased appreciation of **context**, most framings focus on physical determinants and ignore some key considerations:

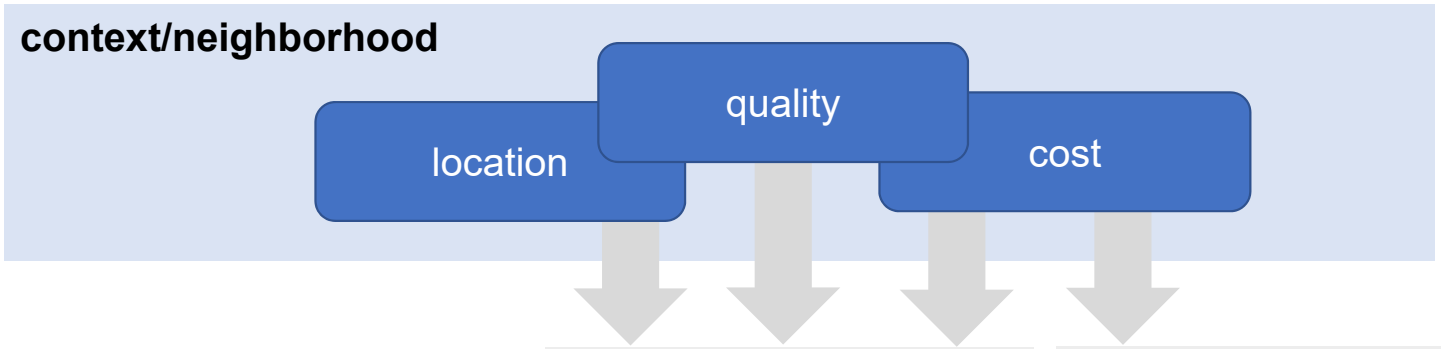
- contextual drivers
- equity
- resilience

EXPOSURES/RISK FACTORS
Air pollutants
Thermal comfort
Water pollutants
Moisture/mold
Dust/soil pollutants
Infectious agents
Noise pollution
Physical activity
Diet/nutrition

HEALTH/WELLNESS OUTCOMES
Birth outcomes
Chronic disease
Injury
Infectious disease
Mental health
Mortality

PATHWAYS TO EQUITABLE HEALTHY CITIES

Housing and health – what matters and what can we change



Location, cost and quality are all relevant to the linkages between housing and health.

Environmental hazards

- air quality
- water quality
- tobacco smoke
- noise
- asbestos
- lead
- radon
- crowding
- thermal conditions
- injury hazards
- accessibility

Social determinants

- affordability
- housing insecurity
- fuel poverty
- etc.

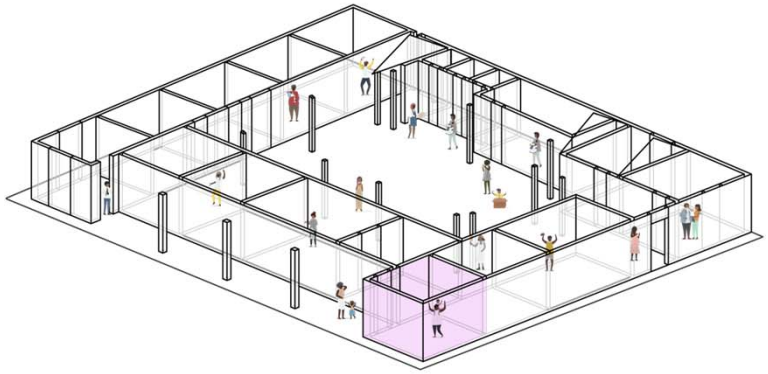
PATHWAYS TO EQUITABLE HEALTHY CITIES

Environmental Health Framework

Design and physical structure

Occupant density/activity

HOUSEHOLD/HOUSING

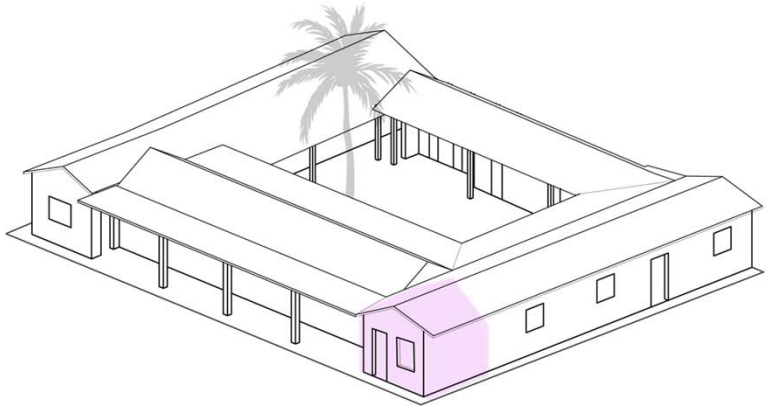


Systems
Infrastructure

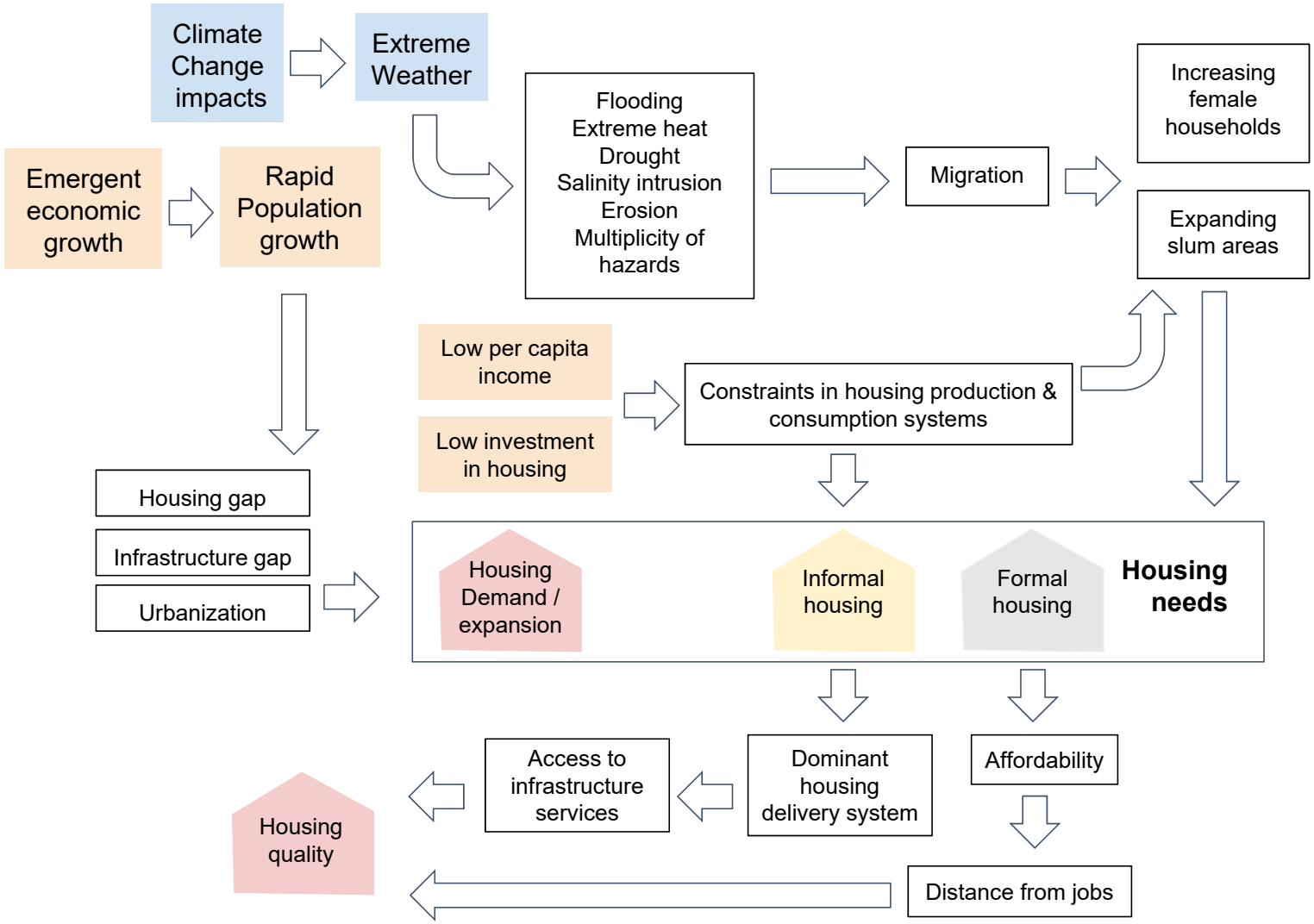
Location

Industry
Transportation
Greenspace
Food environment
Built environment

NEIGHBORHOOD



Stressors / Resilience Framework



Housing quality domains – London

Housing Quality Domains	Examples of Measures
Crowding	Number of people living in home; number of rooms, bedrooms
Physical condition	Year built, material, dimensions of rooms, dampness, mould, structural defects and disrepair (stairs, ceilings, floors, walls, doors, windows)
Thermal comfort	Type of fuel used, central heating appliance, gas system, electrical system, lighting (natural, artificial), number and age of windows, window glazing
Pollution (air and noise)	CO detector, ventilation, number of open fireplaces, noise from various sources (road traffic, aeroplanes, road work, train, noisy neighbours)

*Not included:	WASH (including waste management) Extreme weather events (flooding, earthquake, etc)

Housing quality data sources – UK

- Census
  - 2001, 2011
  - About 5M individuals (10% sample)
- English Housing Survey
  - Annual survey, 2001-2017
  - About 13,000 households in England
  - Questionnaire and physical survey
- Energy Performance Certificates
  - Became mandatory in 2008
  - Valid for 10 years
  - Must be provided when a building is built, sold, or rented
  - Available for almost 2.3M homes in London

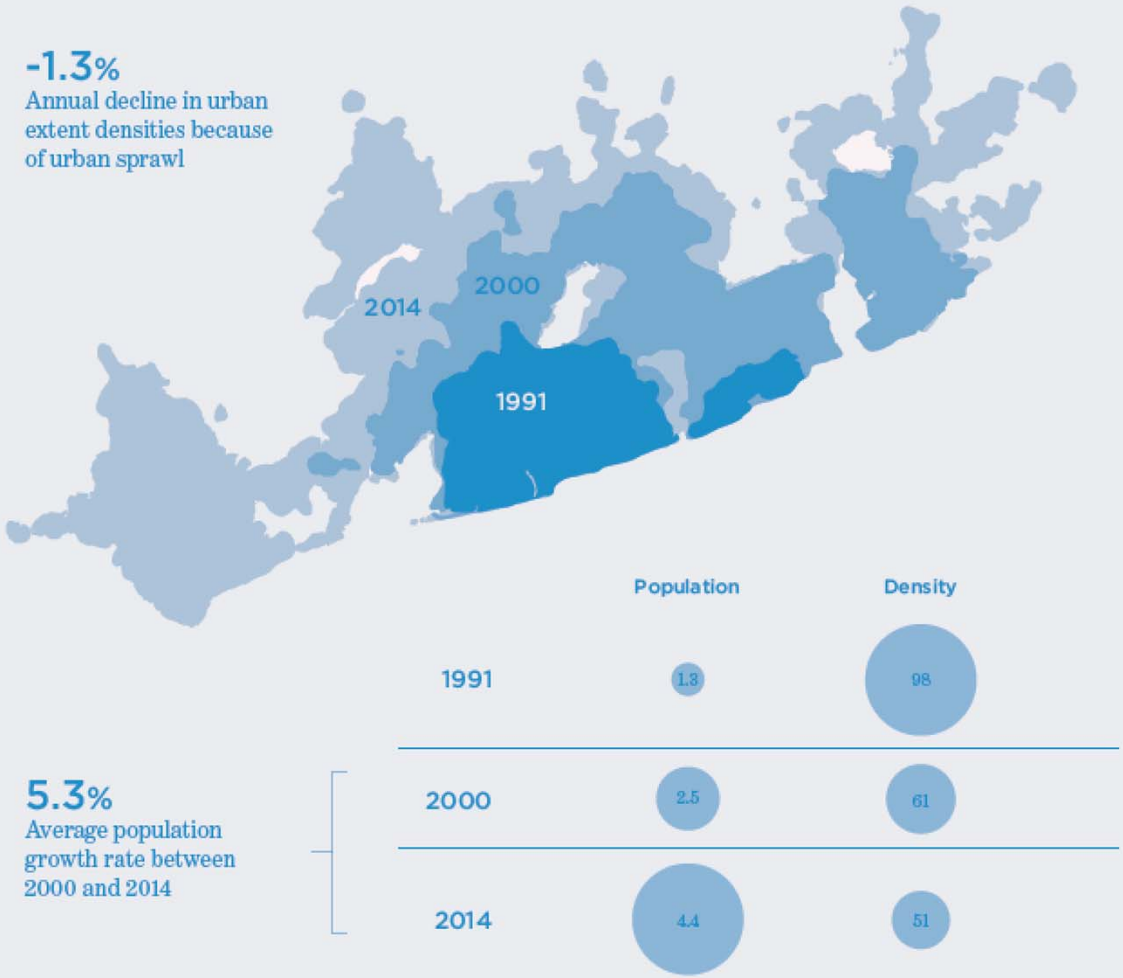
Accra Context

Population in Greater Accra Region:
4.4 million

Population Accra:
1.6 million (42% total population)

Sprawl
1991 to 2014: Density in Accra declined from **98 persons/hectare** to **51 persons/hectare** in 2014

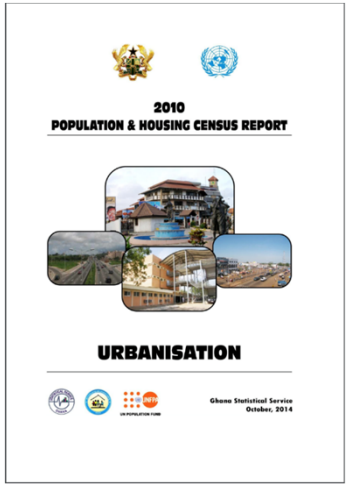
Daily Commuters
Estimated daily commuters: 2 million

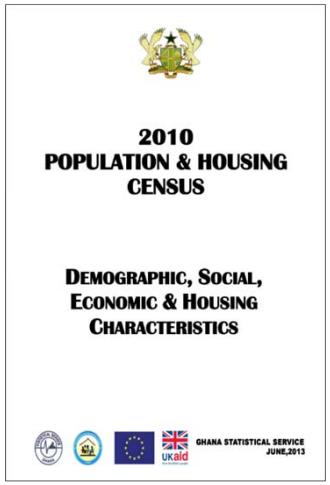


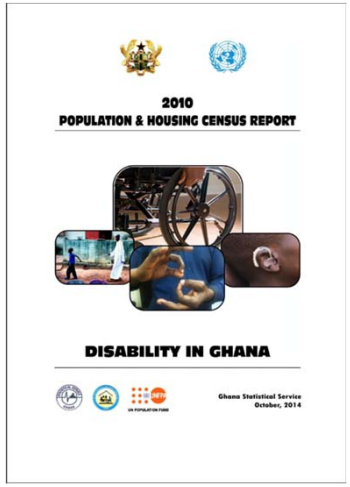
Accra Metropolitan Assembly & 100 Resilient Cities, *Accra Resilient Strategy*, 100 Resilient Cities, March, 2019.

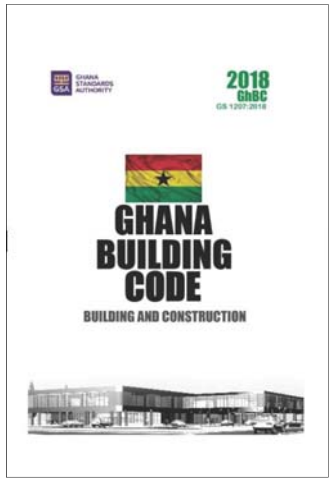
Context - Ghana

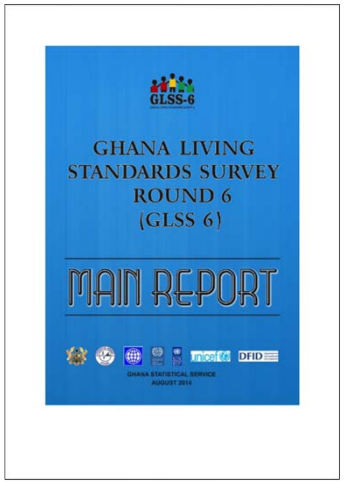
National reports



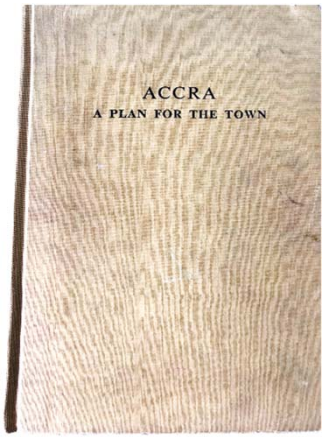


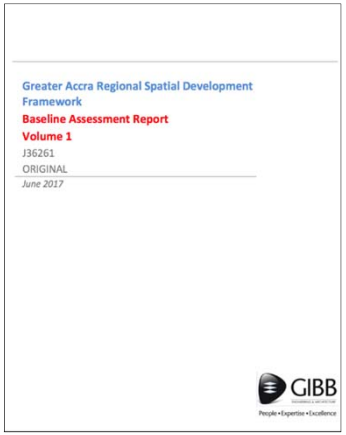


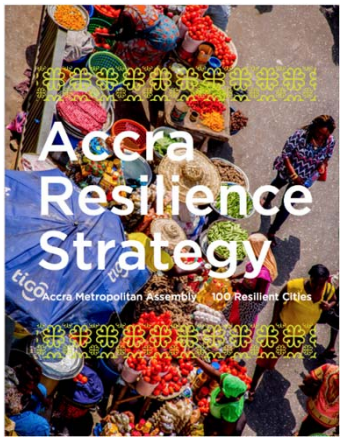




Accra-based reports

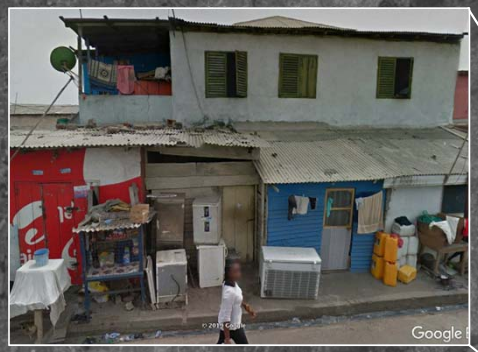






PATHWAYS TO EQUITABLE HEALTHY CITIES

Housing in Accra
…a first look



Appolonia City

Ashiyie

East Legon

Nima

Labone

Adabraka

Asylum Down

Lartebiokorshie

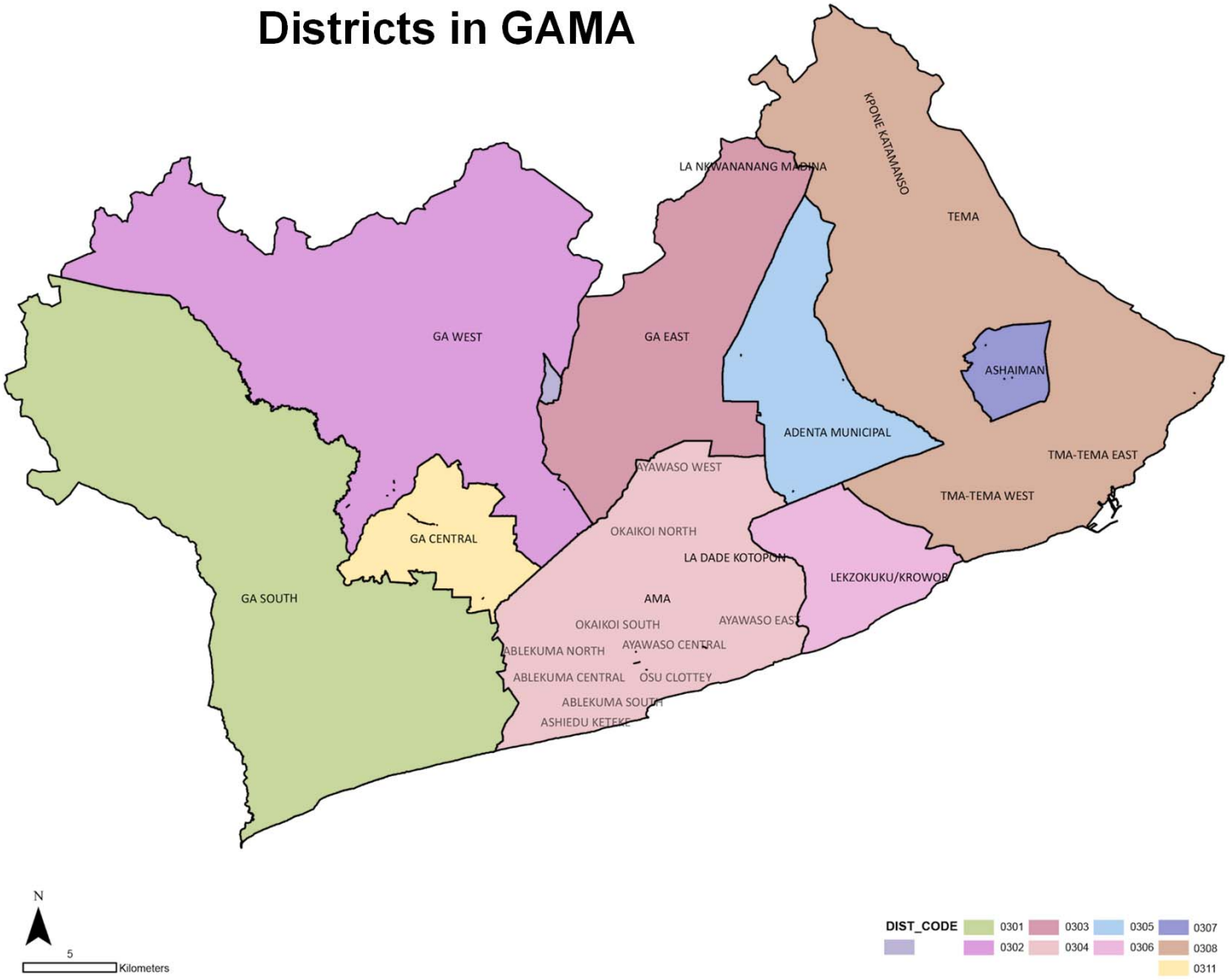
Sodom and Gomorrah

Sabon Zango

Jamestown / Ushertown

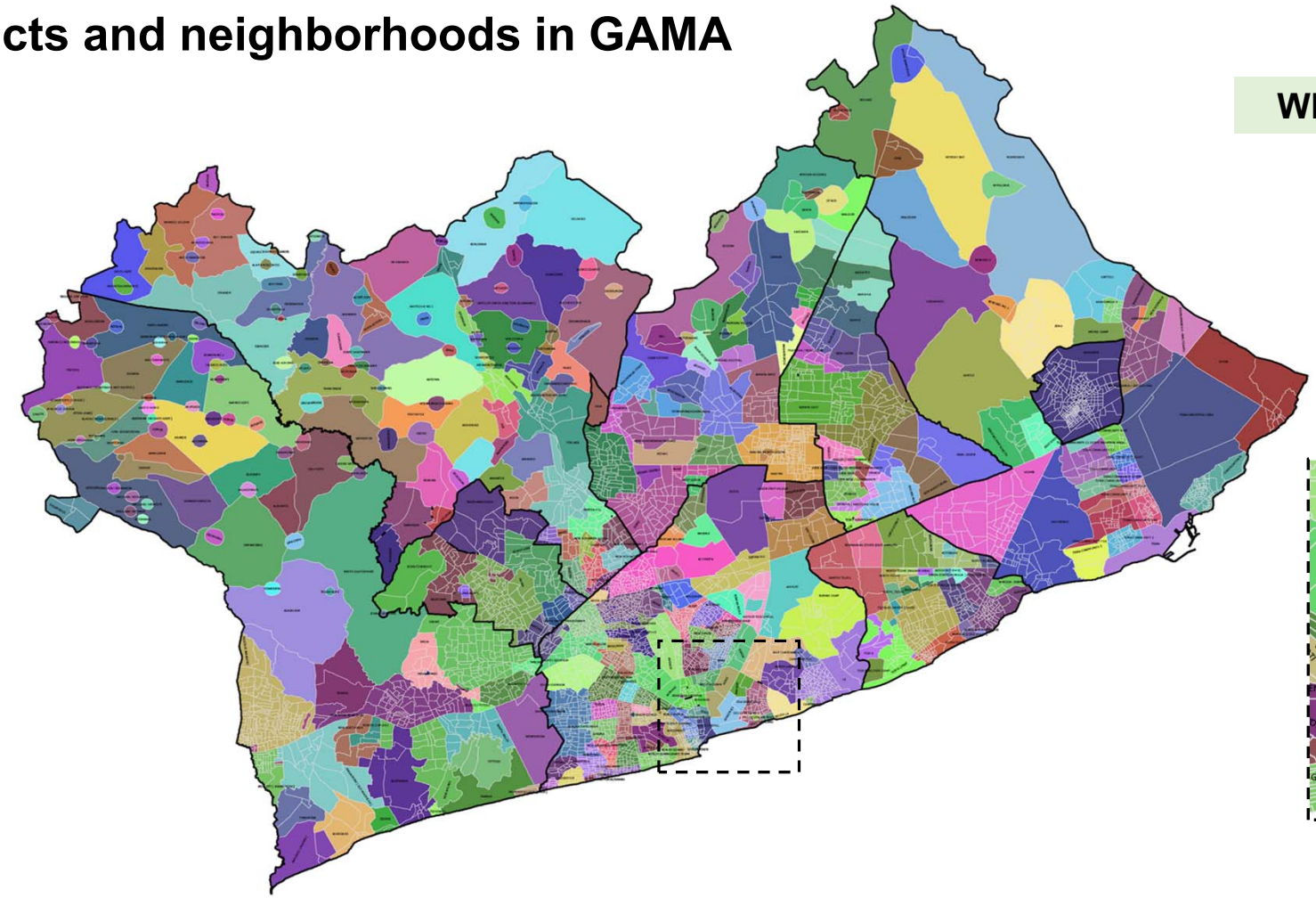
Chorkor

Districts in GAMA



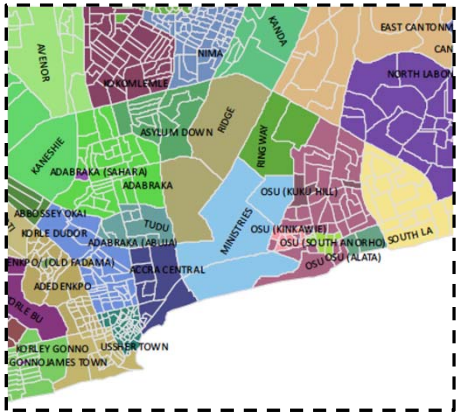
PATHWAYS TO EQUITABLE HEALTHY CITIES

Districts and neighborhoods in GAMA



What is a neighborhood?

We used Brian King's algorithm – A point within each EA is geo-located and the neighborhood name is taken from Google Maps address associated with this point



N

5 Kilometers

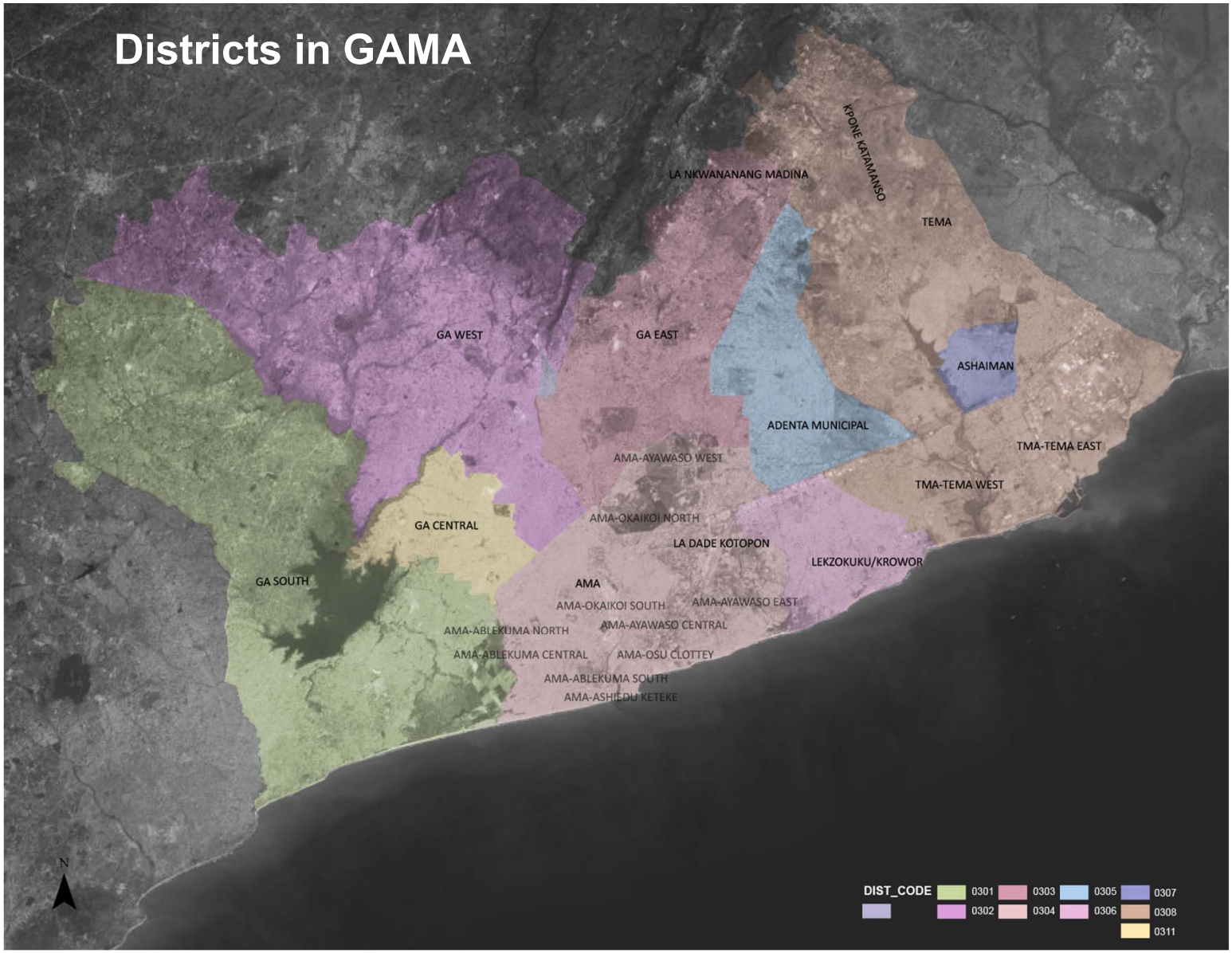
Legend

Regions

2010 Census

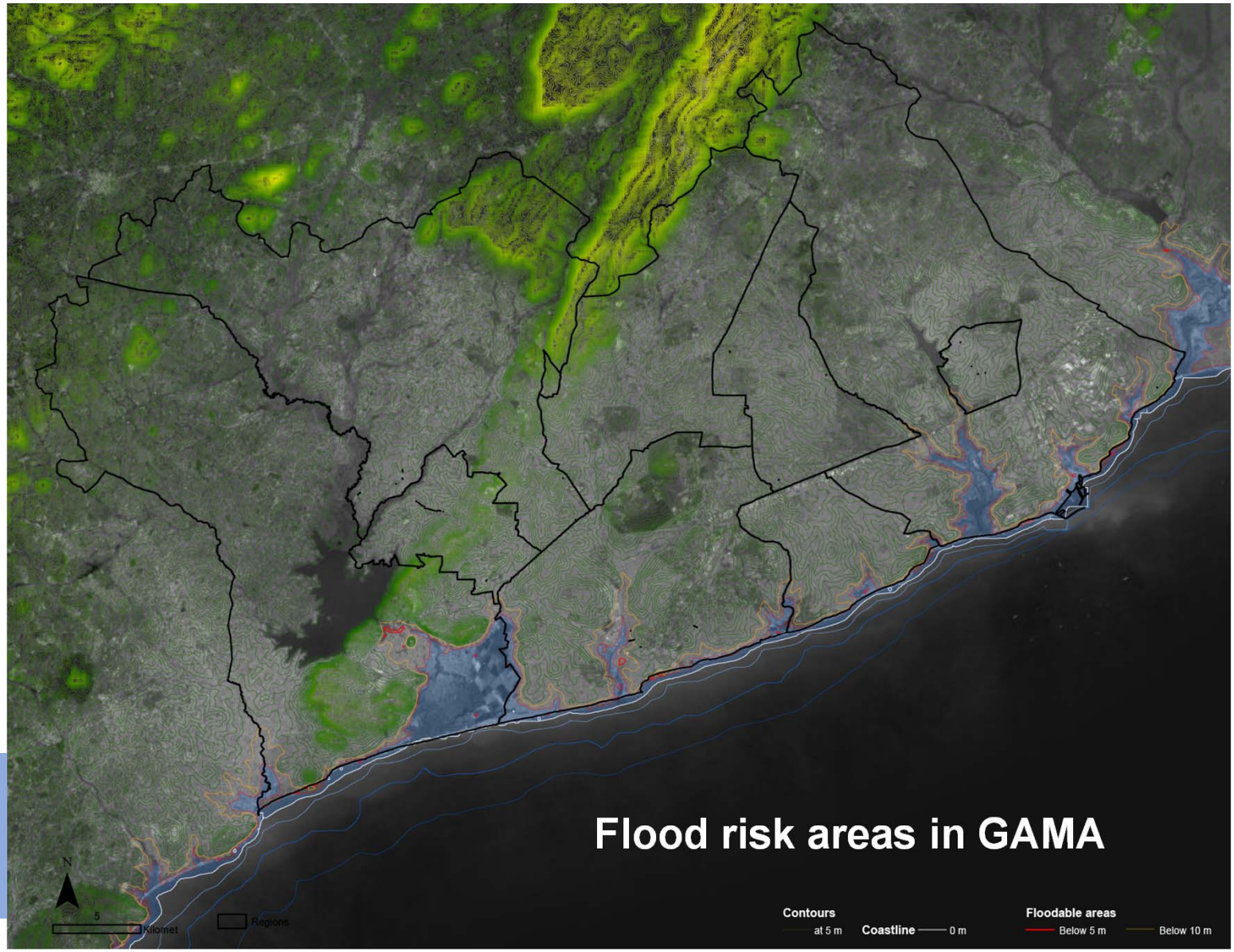
PATHWAYS TO EQUITABLE HEALTHY CITIES

Districts in GAMA



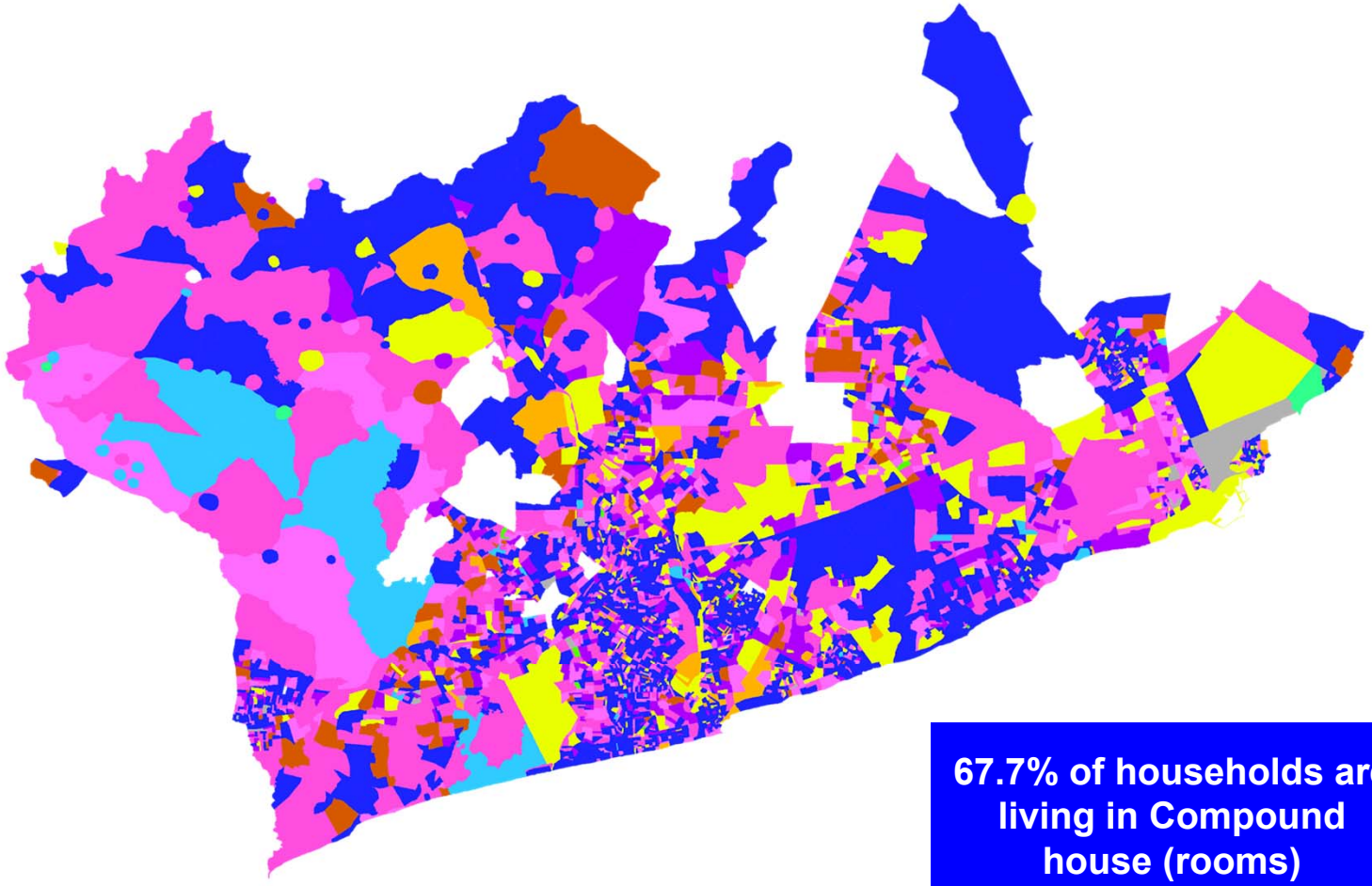
PATHWAYS TO EQUITABLE HEALTHY CITIES

Areas in blue define zones below 5m elevation



PATHWAYS TO EQUITABLE HEALTHY CITIES

Dwelling type (by EA)



67.7% of households are living in Compound house (rooms)

N

5 Kilometers

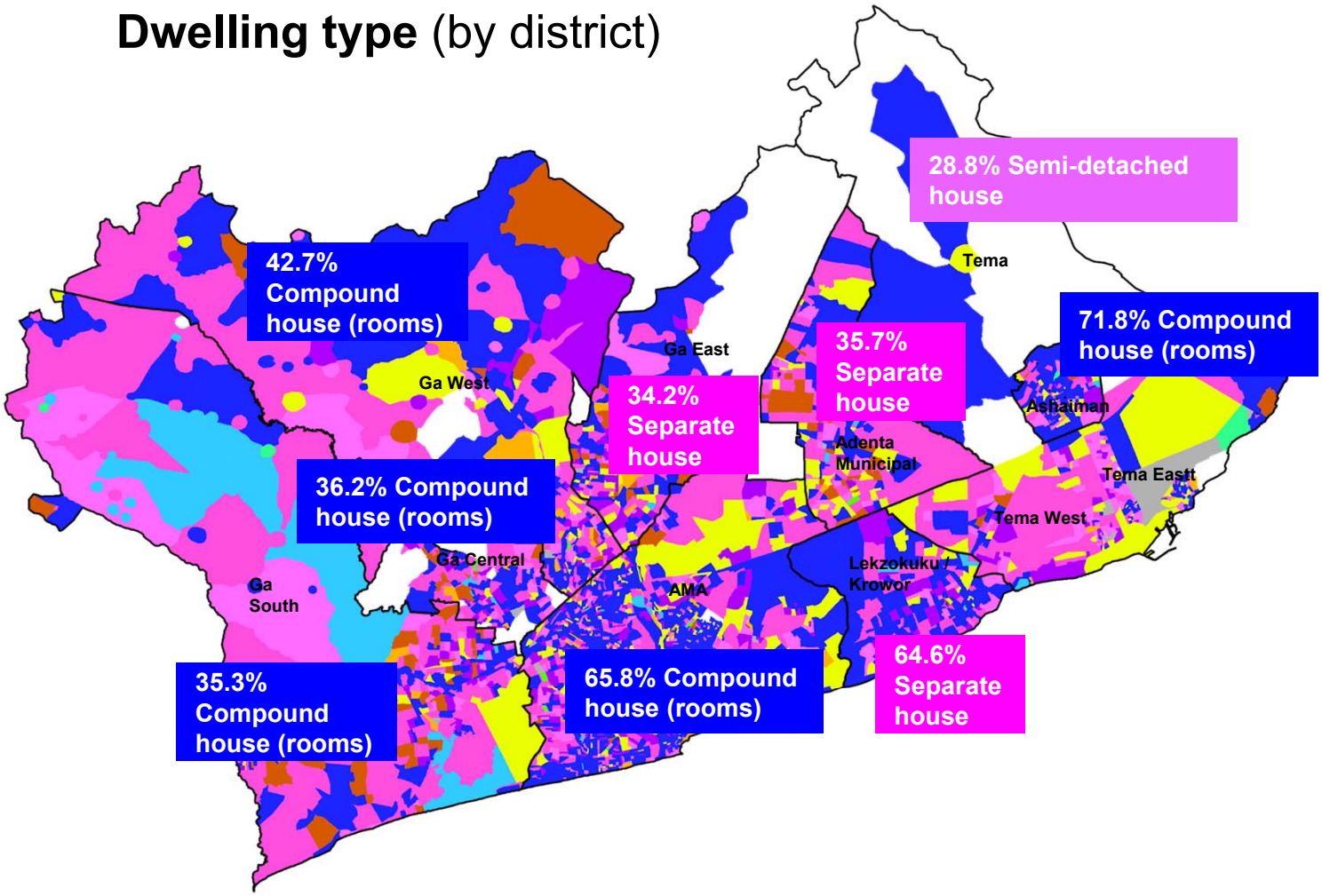
Legend

DWELLING

- Separate house
- Semi-detached house
- Flat/Apartment
- Compound house (rooms)
- Huts/Buildings (same compound)
- Huts/Buildings (different compound)
- Tent
- Improvised home (kiosk/container,etc)
- Living quarters attached to office/shop
- Uncompleted building
- Other

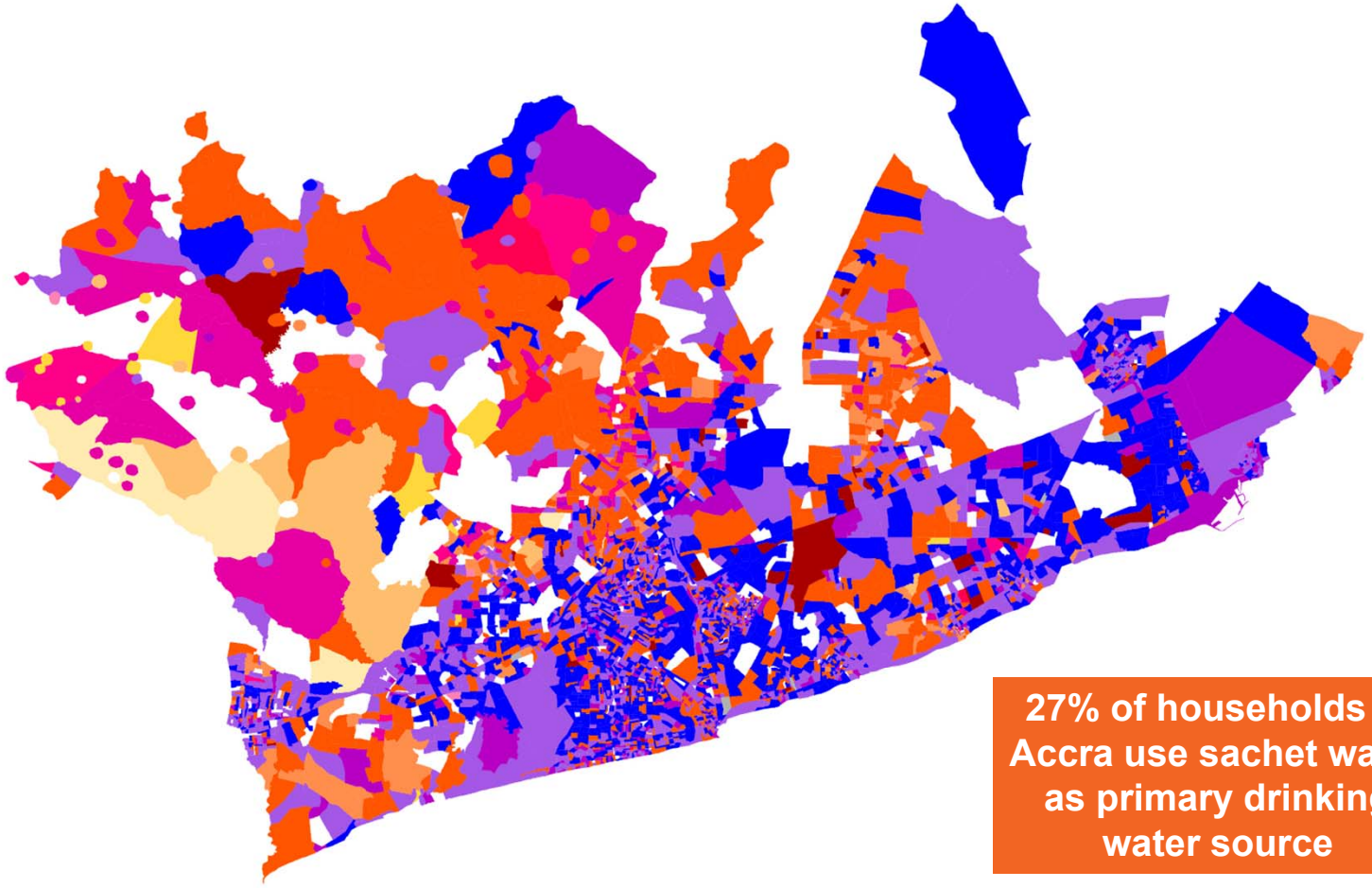
PATHWAYS TO EQUITABLE HEALTHY CITIES

Dwelling type (by district)



PATHWAYS TO EQUITABLE HEALTHY CITIES

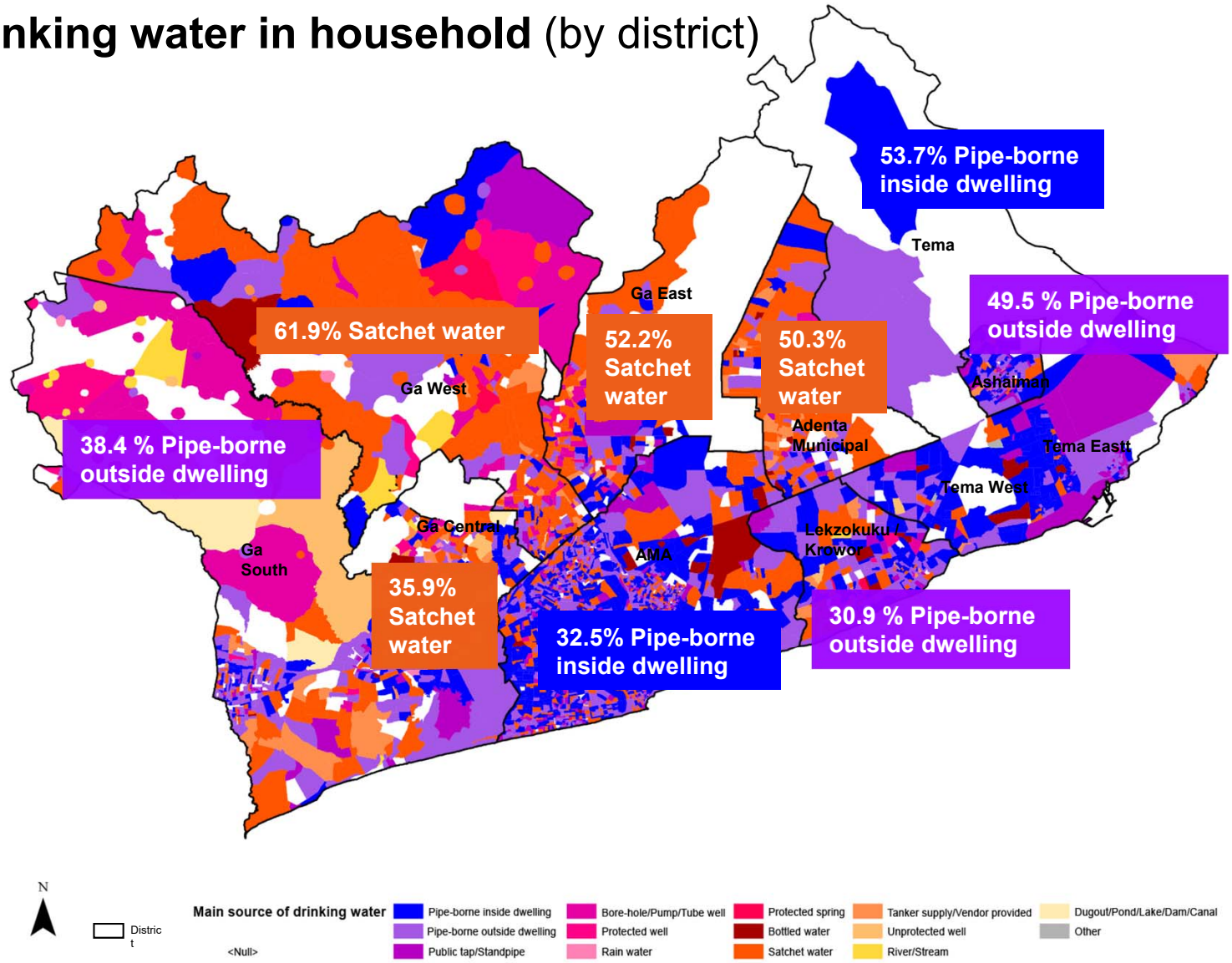
Drinking water in household (by EA)



27% of households in Accra use sachet water as primary drinking water source

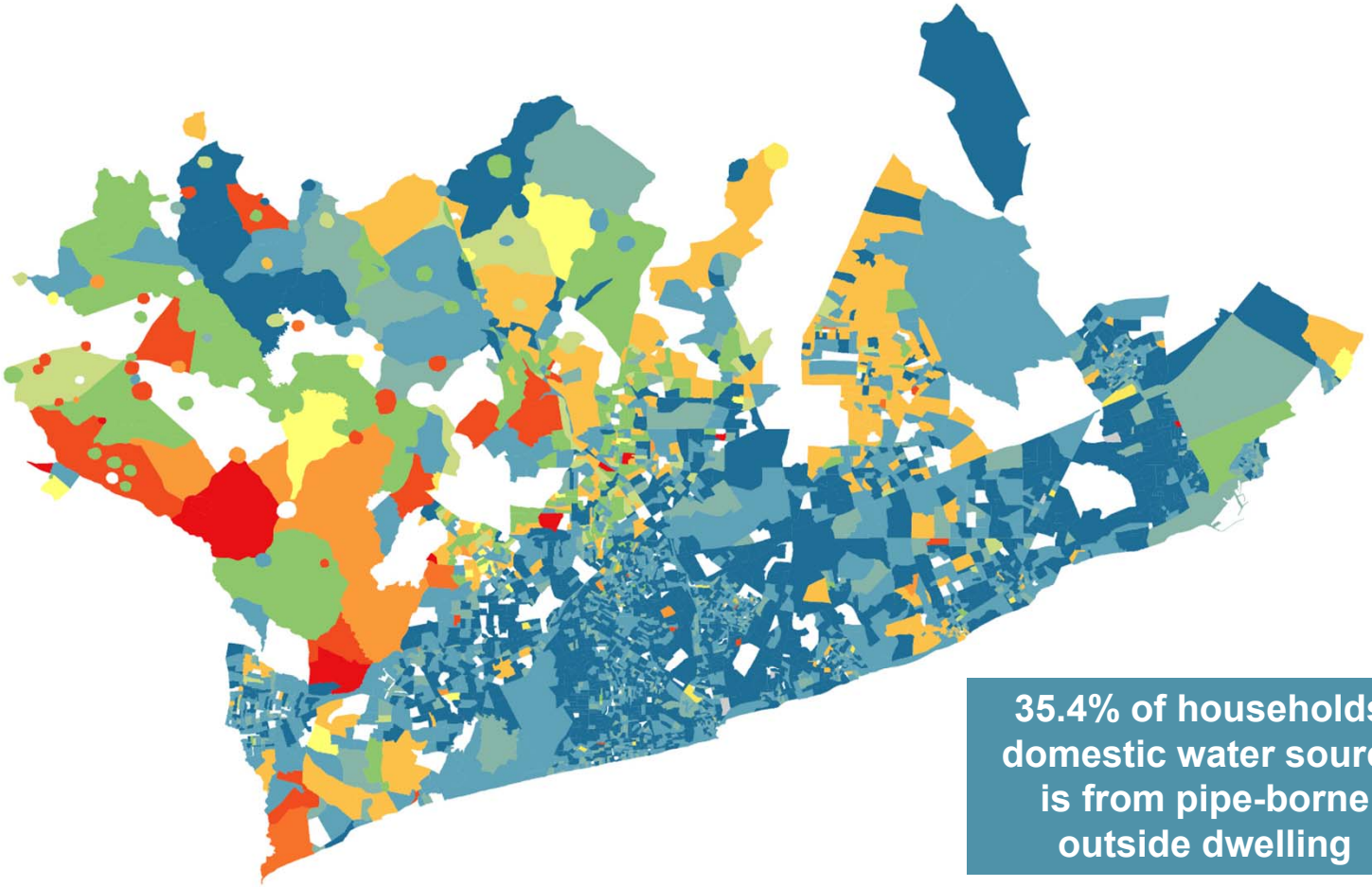
PATHWAYS TO EQUITABLE HEALTHY CITIES

Drinking water in household (by district)

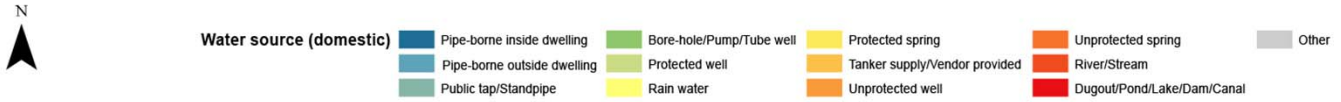


PATHWAYS TO EQUITABLE HEALTHY CITIES

Water Source (domestic use by EA)

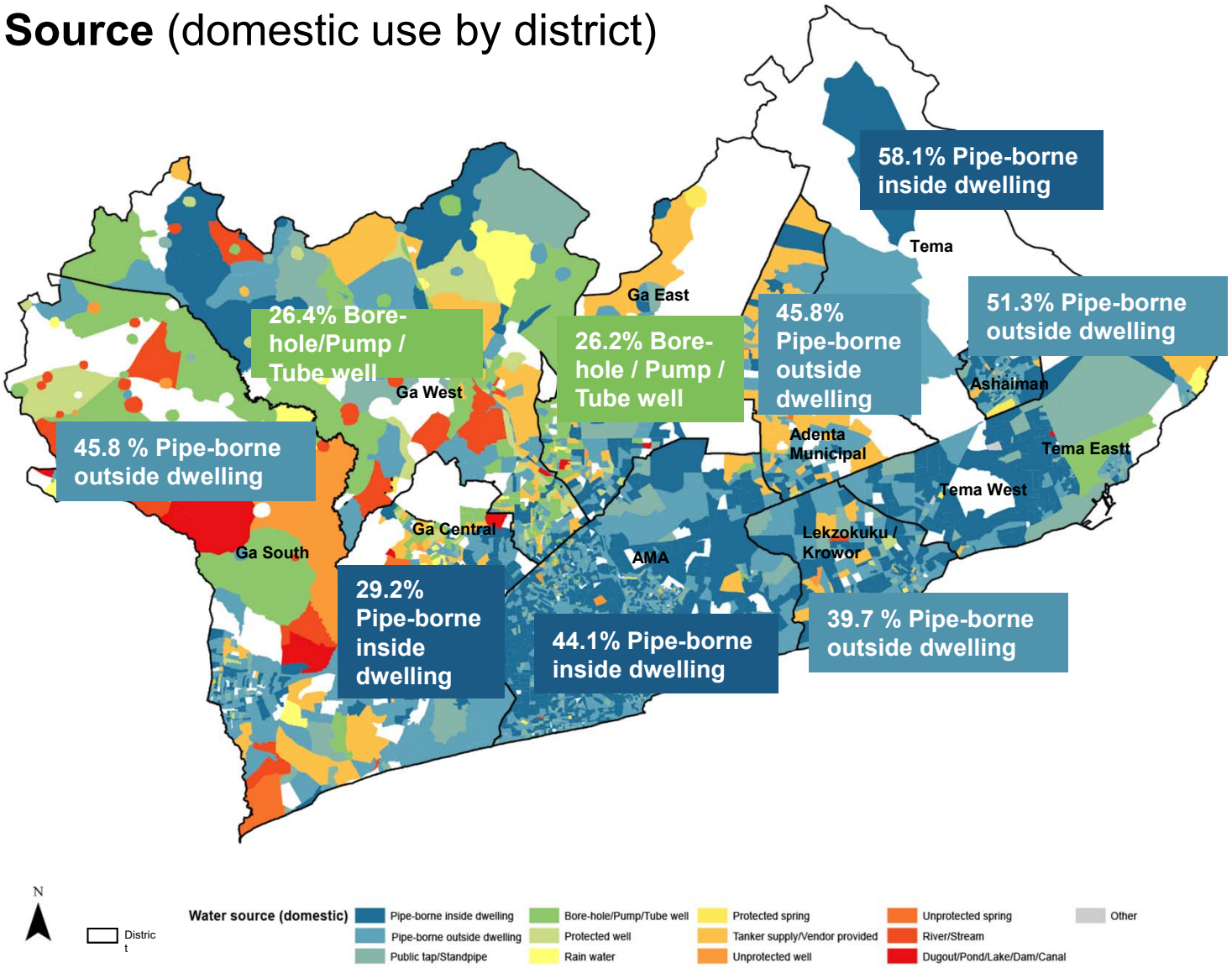


35.4% of households' domestic water source is from pipe-borne outside dwelling



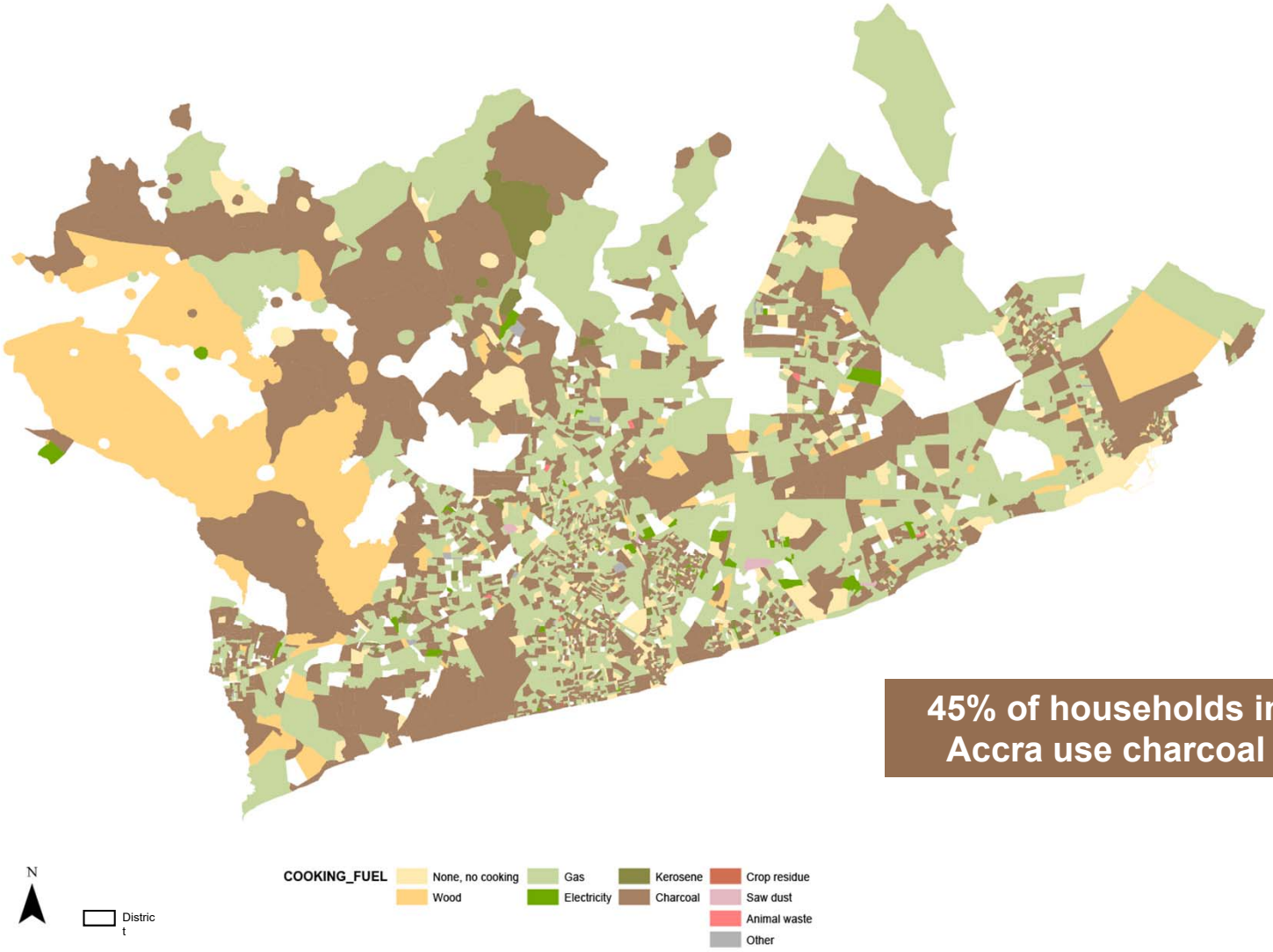
PATHWAYS TO EQUITABLE HEALTHY CITIES

Water Source (domestic use by district)



PATHWAYS TO EQUITABLE HEALTHY CITIES

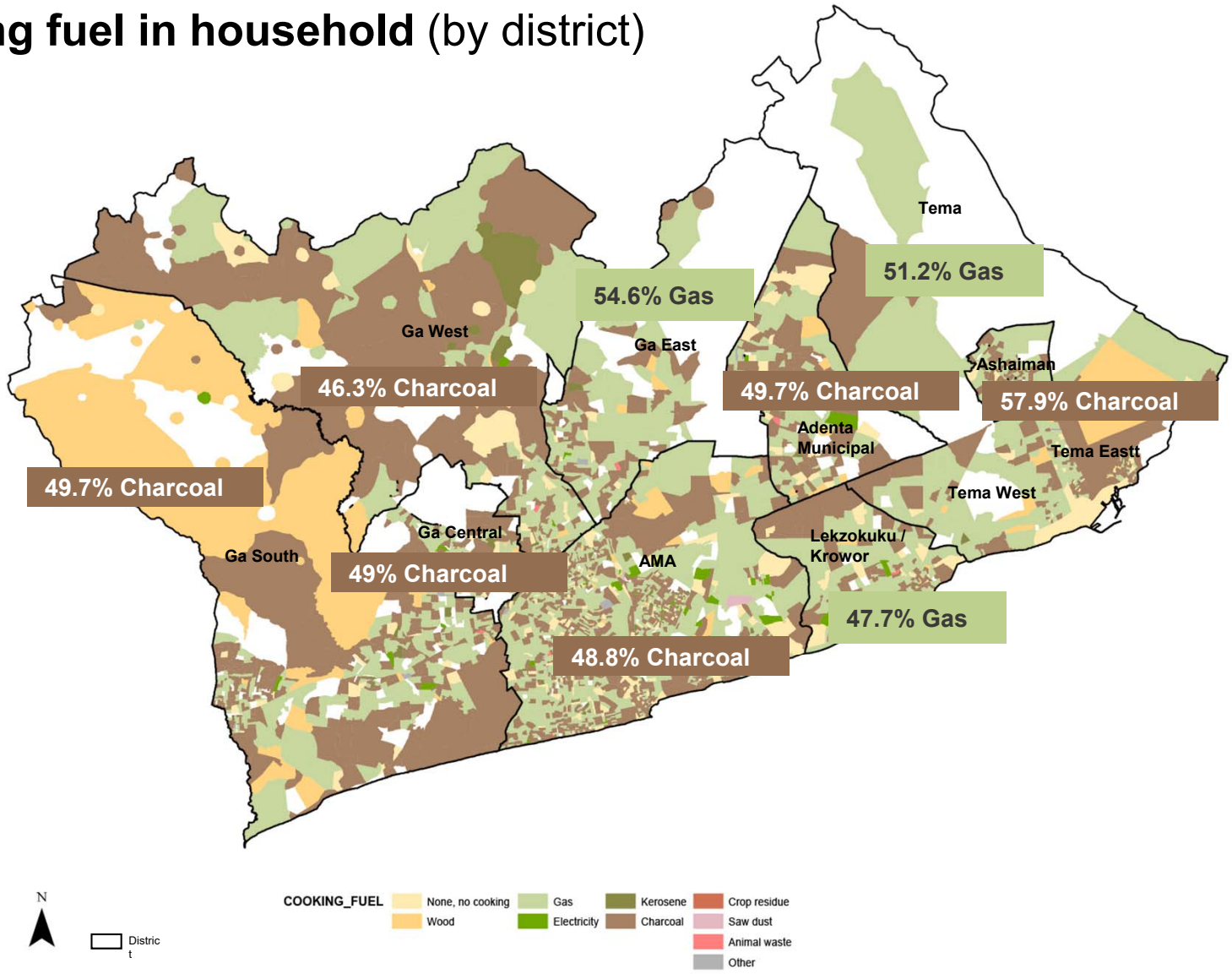
Cooking fuel in household (by EA)



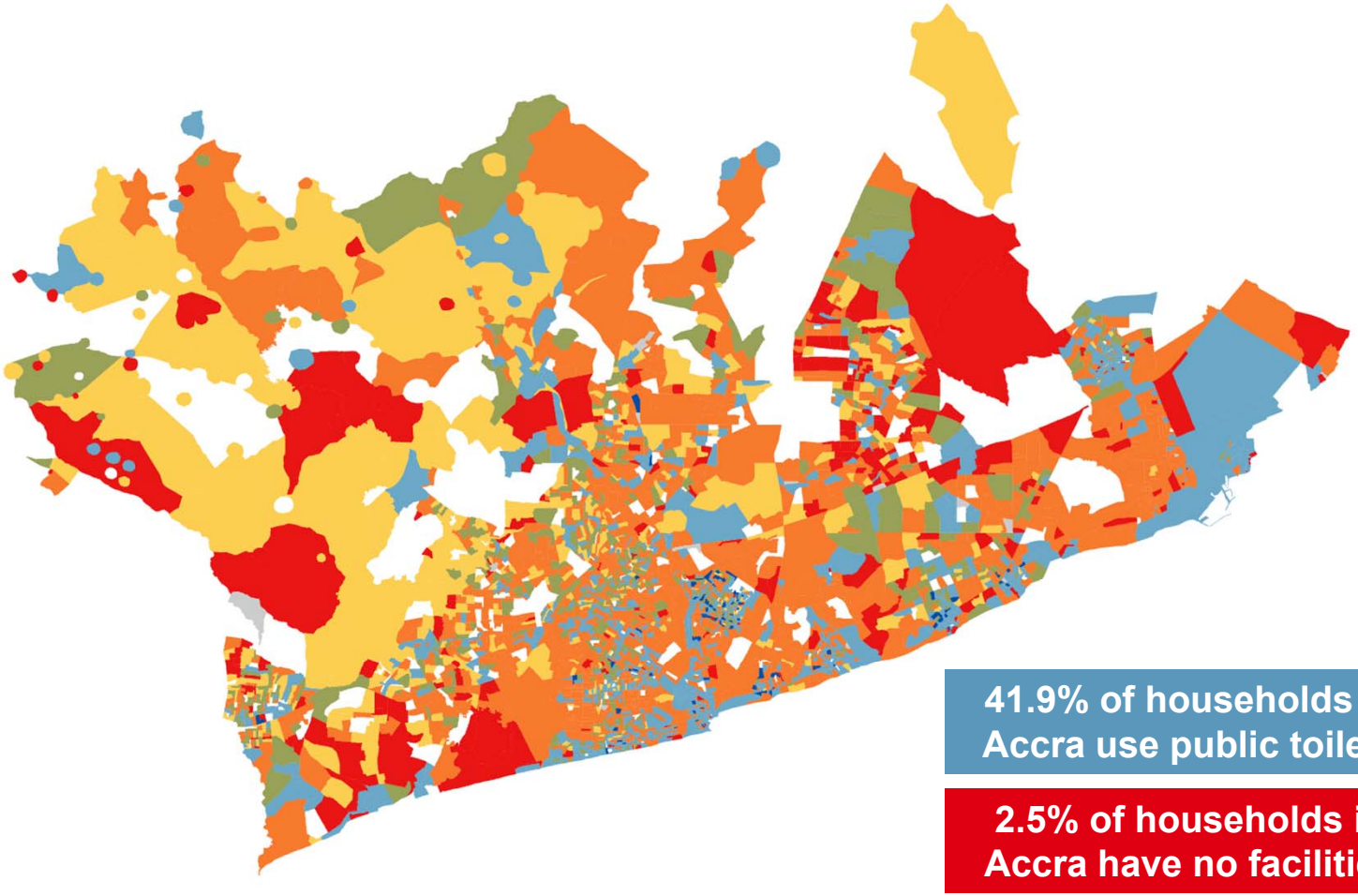
45% of households in Accra use charcoal

PATHWAYS TO EQUITABLE HEALTHY CITIES

Cooking fuel in household (by district)



Toilet in household (by EA)

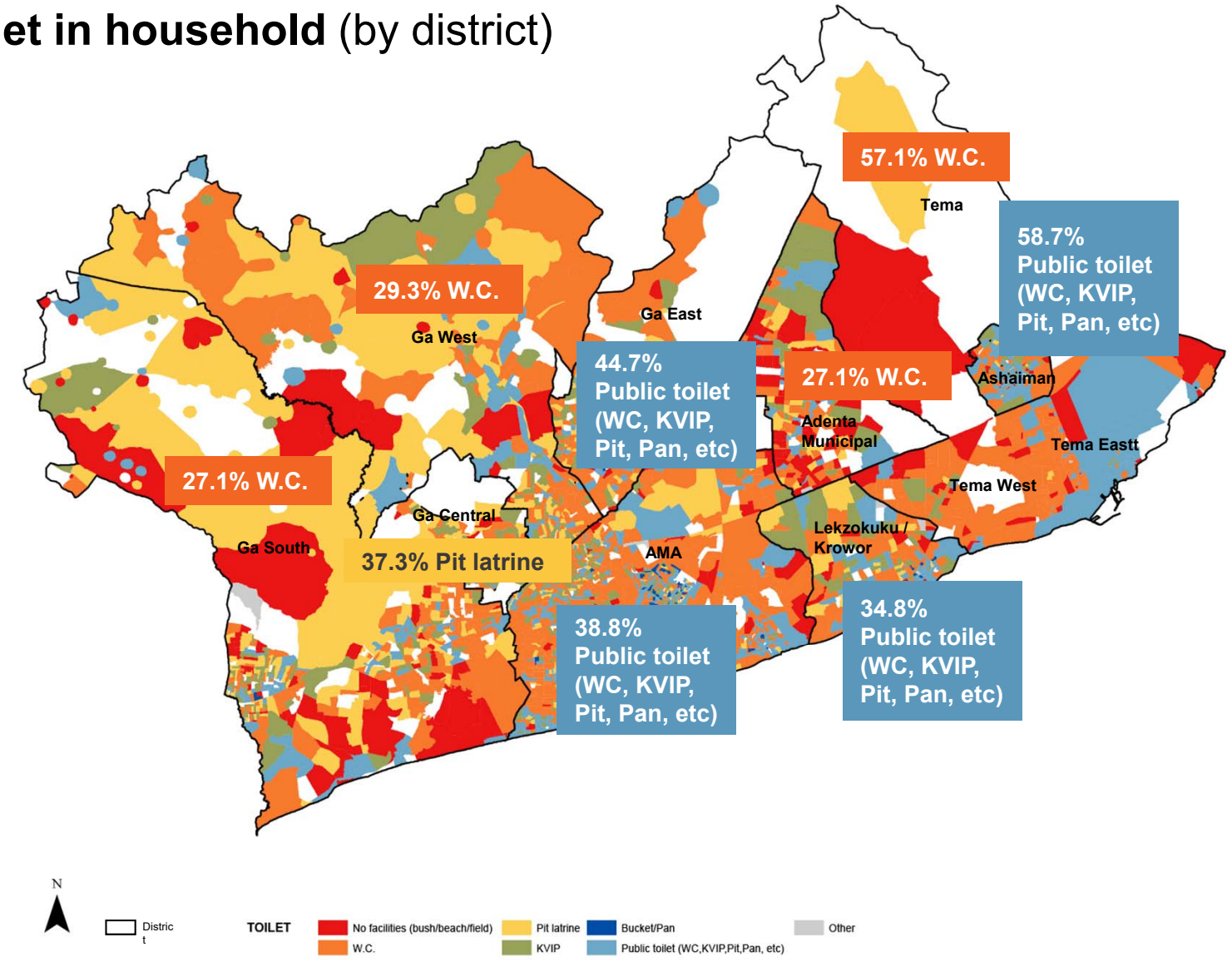


41.9% of households in Accra use public toilets

2.5% of households in Accra have no facilities

PATHWAYS TO EQUITABLE HEALTHY CITIES

Toilet in household (by district)



Next steps

- Suggestions for upcoming calls
  - Aug 8
  - Sep 12
  - Oct 10
  - Nov 14
  - Dec 12
- Other projects/activities?

Thank You