



# Obesity in African migrant and non-migrant populations

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# Migration



United Nations (2016). *International Migration Report 2015: Highlights* (ST/ESA/SER.A/375).



# Worldwide migration

- International migrants worldwide
  - 173 milion in 2000 → 258 million in 2017
- High-income countries host  $\frac{2}{3}$  of all migrants
- In cities such as London and Amsterdam 1 in 3 is of migrant descent
- In Washington DC 49% of population of African descent



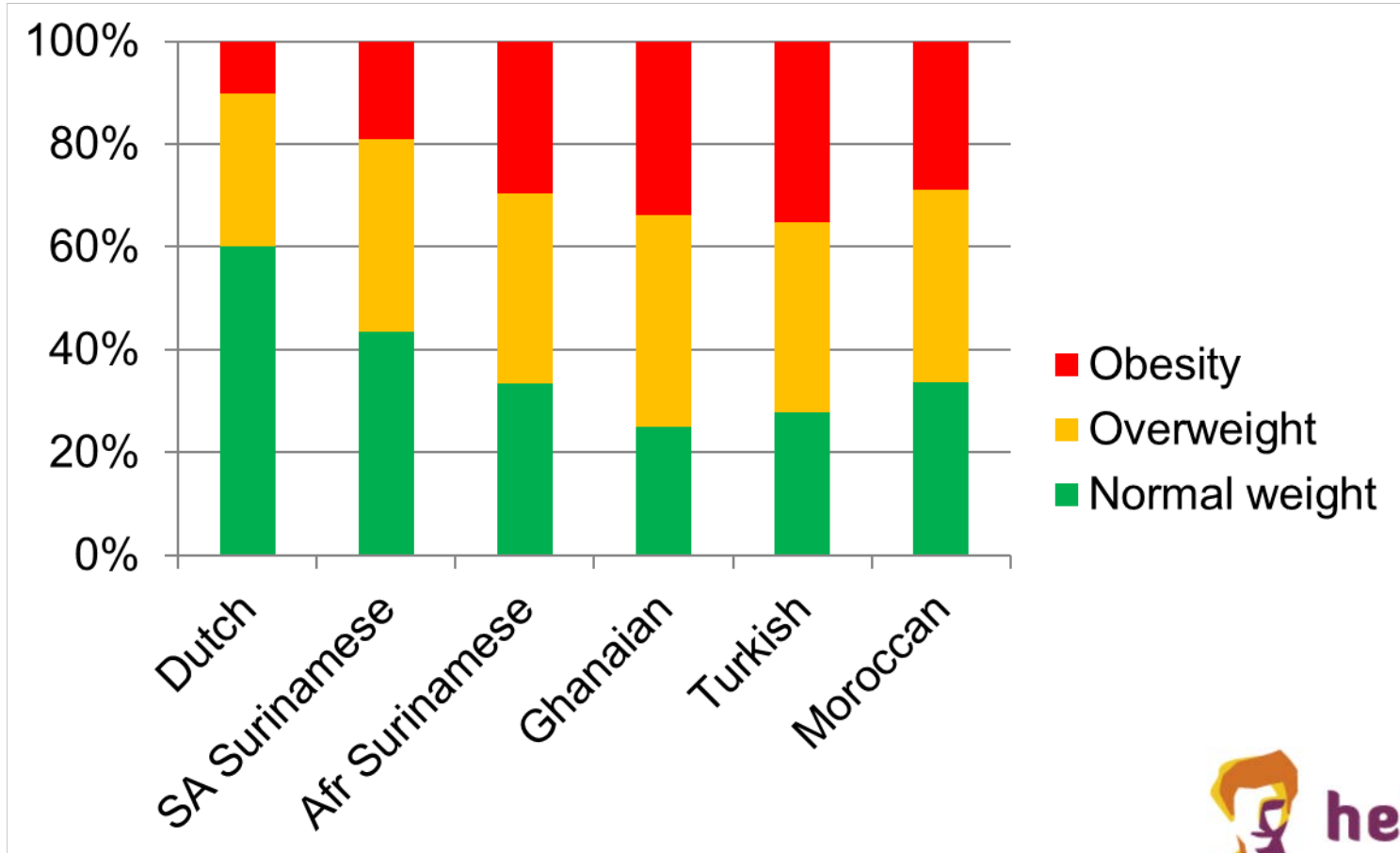
# Three ways for assessing migrant health

- Compare ethnic minorities with host population
  - Ethnic differences or inequalities
- Compare same ethnic minority group living in different countries
  - The role of national context
- Compare ethnic minorities with compatriots in home countries
  - The role of migration





# Ethnic inequalities

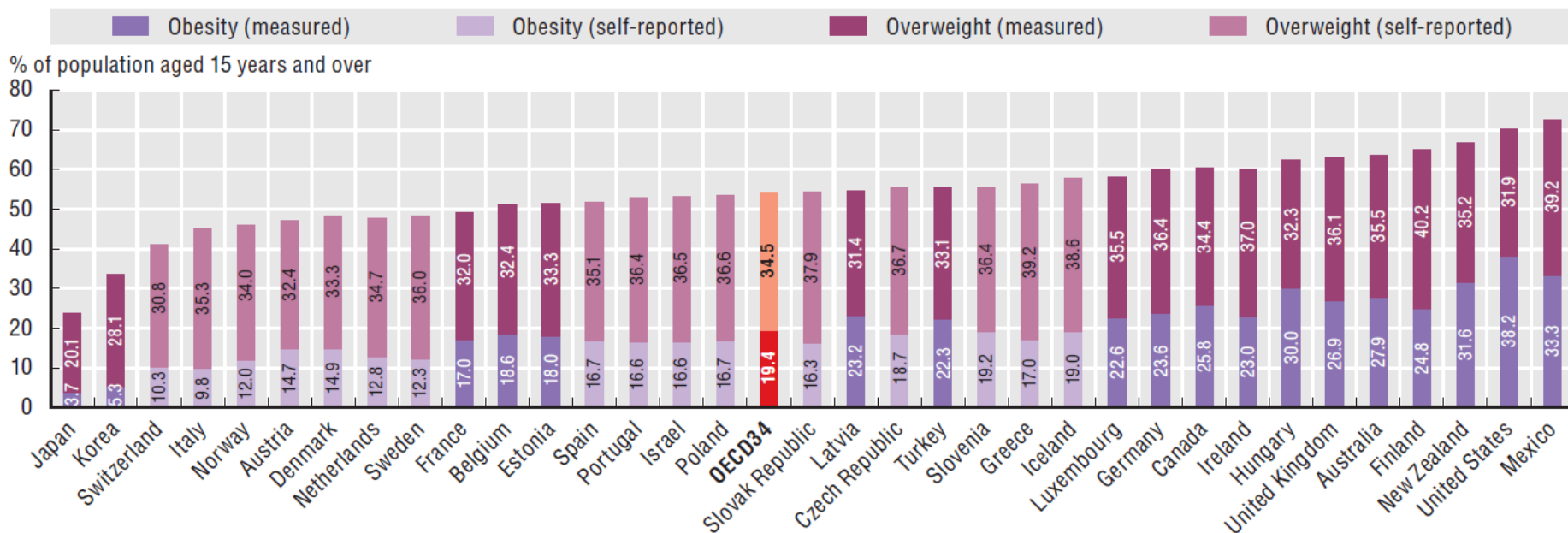


Snijder et al. *BMJ Open* 2017 Dec 14;7(12):e017873



# Diversity within high income countries

Prevalence overweight including obesity among adults, 2015 (or nearest year)

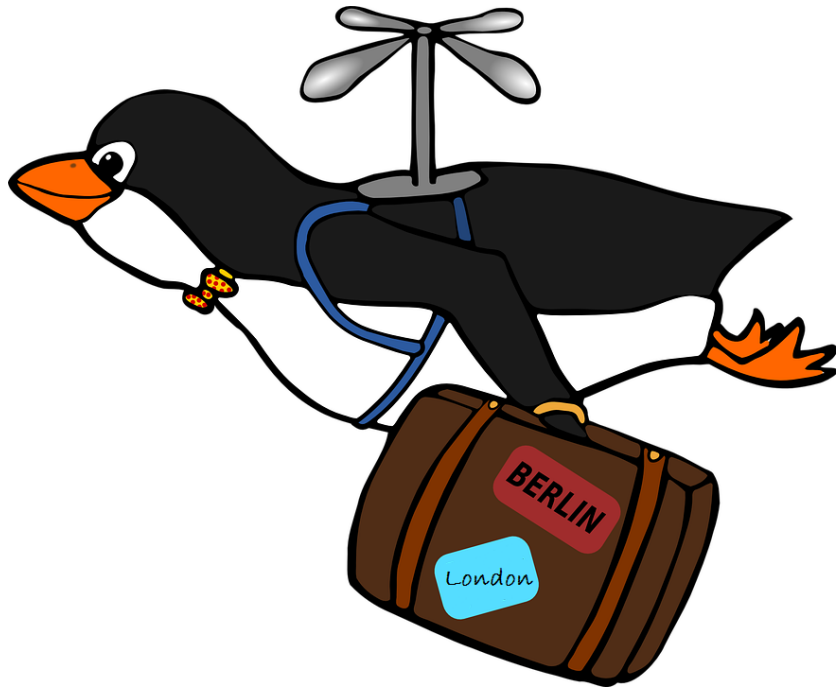


Source: OECD Health Statistics 2017.



# The role of national context

## It matters where one migrates to !



National context differs and can influence:

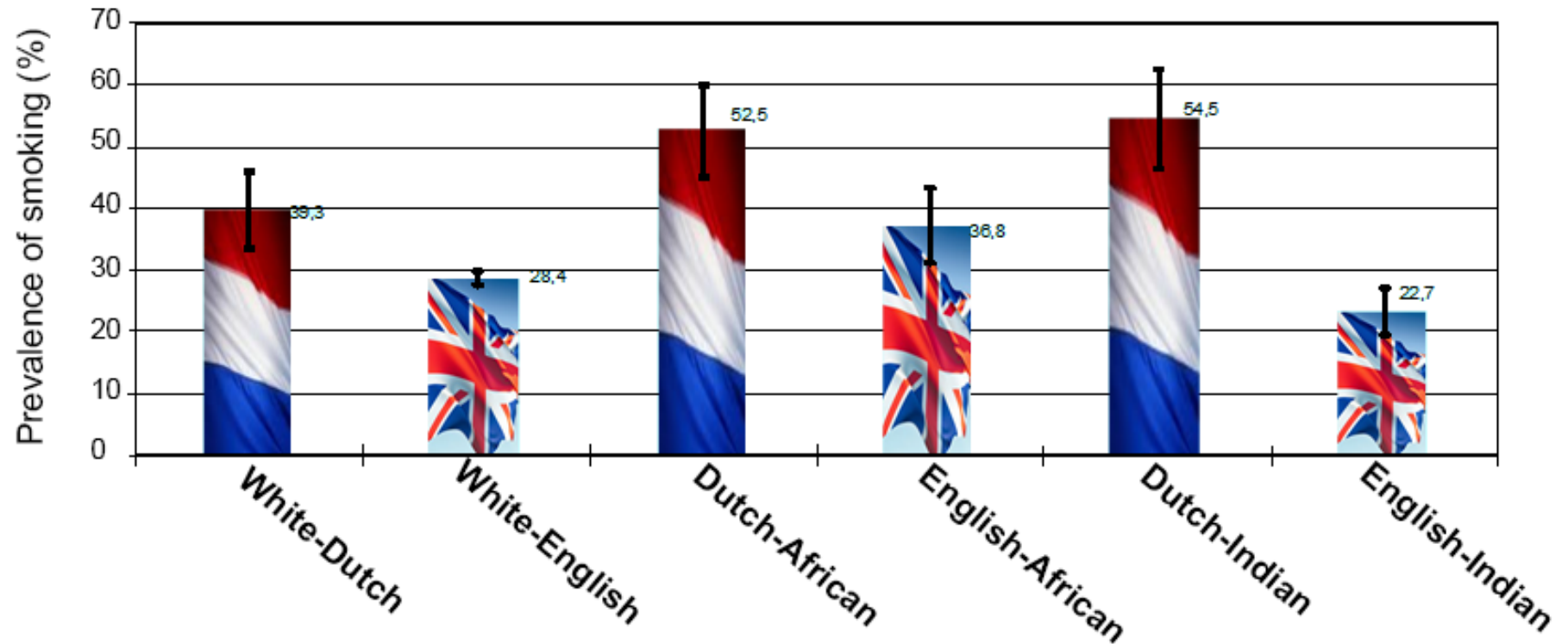
- Opportunities in life (e.g. SES)
- Lifestyle and related factors (e.g. diet)
- Health care (e.g. access, policy)

- Pinpoint national contextual factors driving the risk
- Knowledge beneficial to the host population



# The role of national context

Age-standardised prevalence of smoking among Dutch and English ethnic groups



Agyemang et al. *Nicotine Tob Res* 2010;12:557-66.





# The role of migration

Important for ethnic minorities and their home countries alike

- Ethnic minorities:
  - Reveal real lifestyle changes upon migration
  - Pinpoint key predisposing factors for poor health
  - Results taken more seriously by minorities (hit home message)
- Ethnic minority peers in home countries
  - Provides indication of future threat of diseases

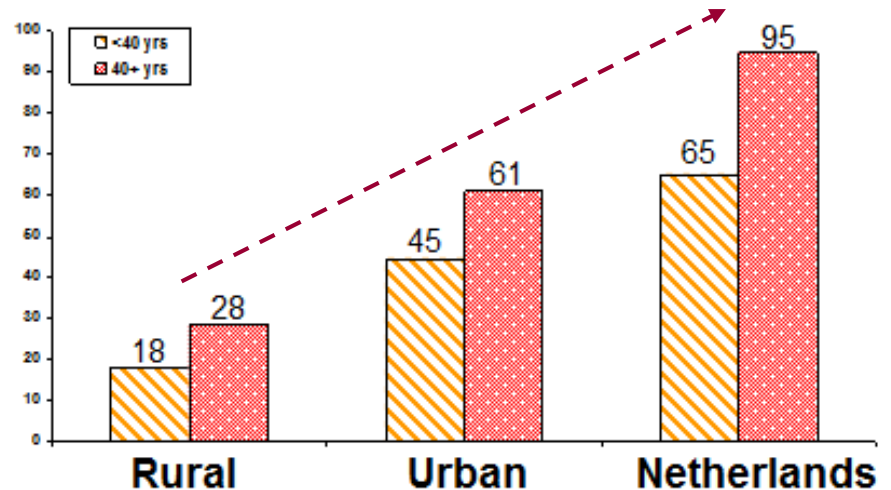
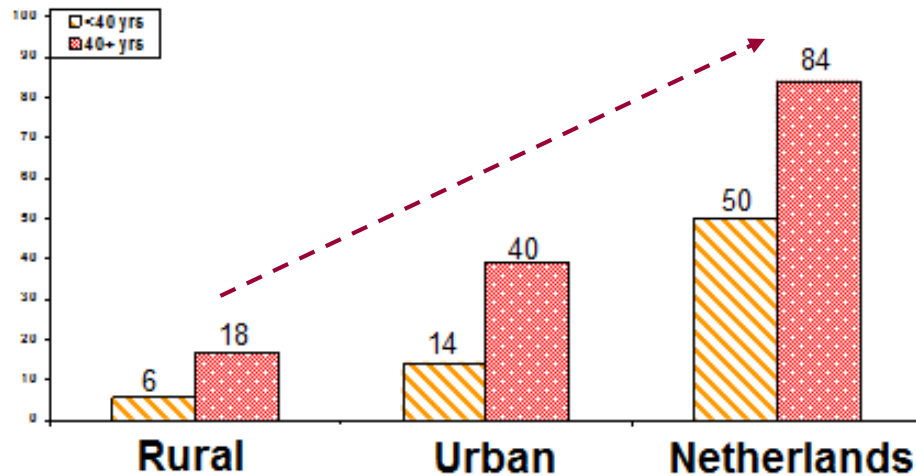


# The role of migration

Prevalence of overweight + obesity (BMI  $\geq 25$ ) by age & three localities in Ghanaians

Men

Women



Agyemang et al. *Public Health Nutrition* 2009;12:909-16



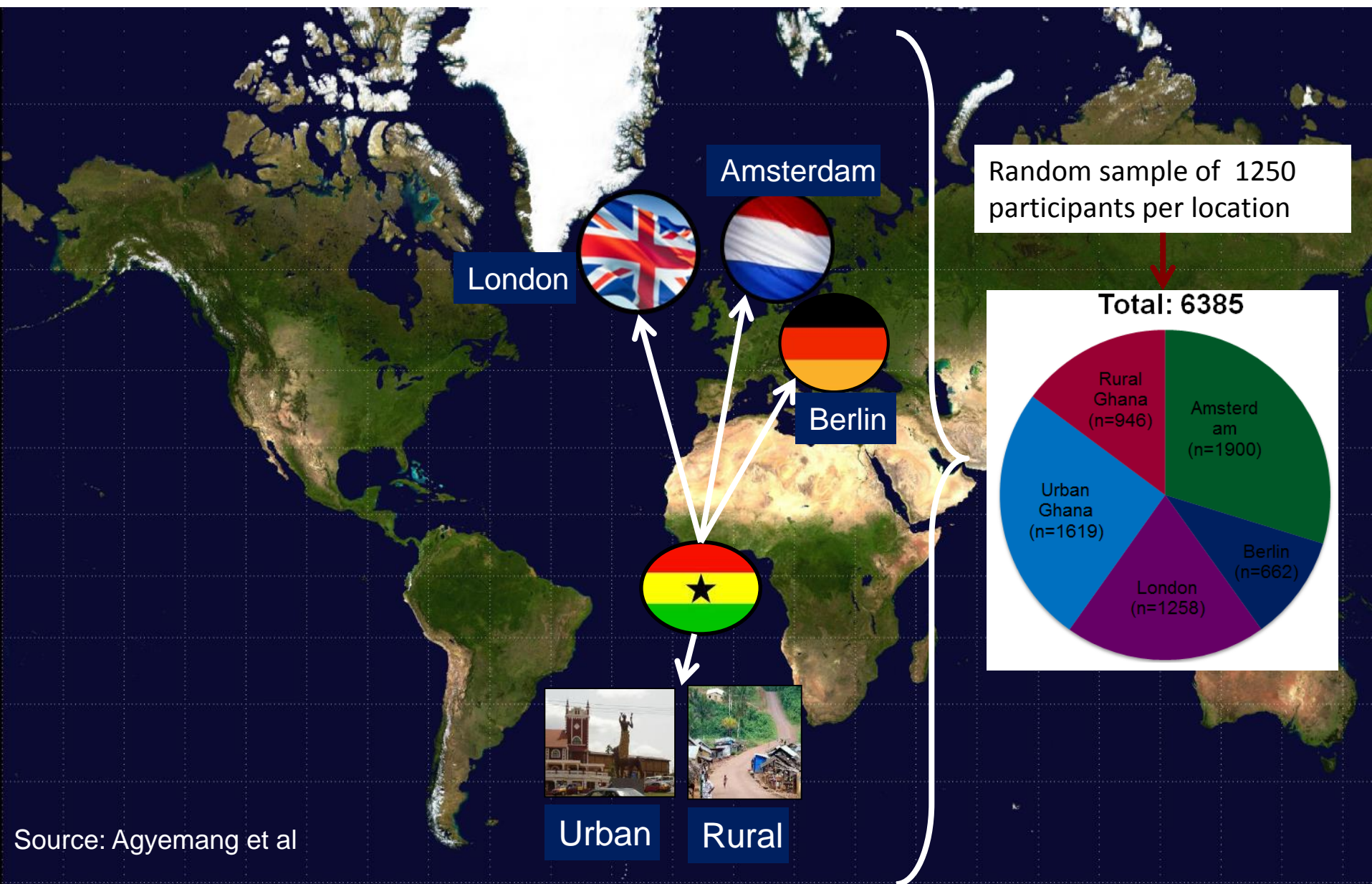
# The RODAM study

## Research on Obesity and Diabetes among African Migrants

<http://www.rod-am.eu/home>



# Data collection RODAM

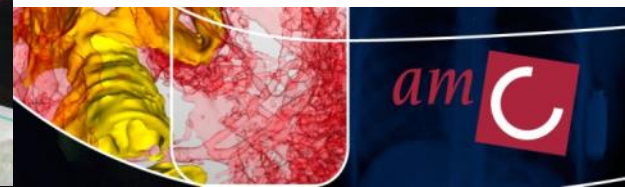


Source: Agyemang et al





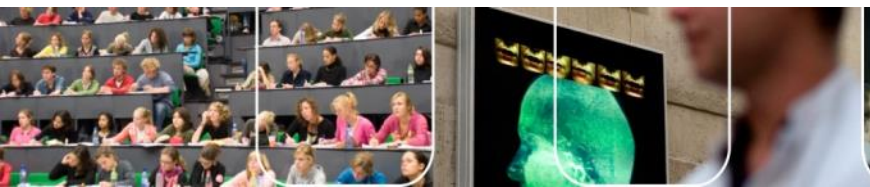
**Rural Ghana**







## Urban Ghana



# Europe

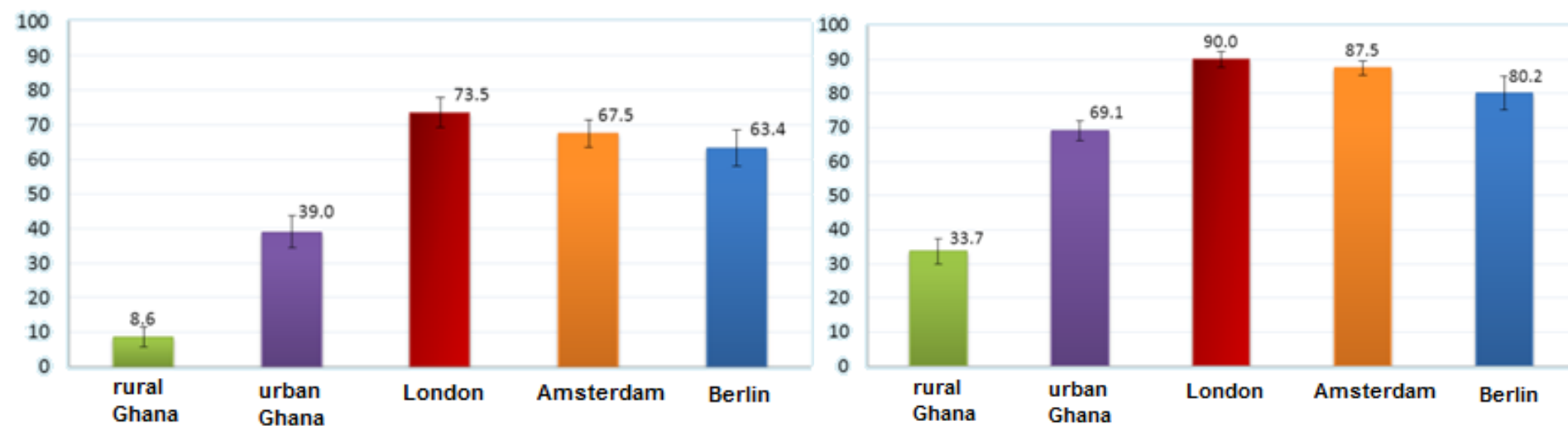




# Age-standardised prevalence of overweight + obesity ( $\text{BMI} \geq 25 \text{ kg/m}^2$ ) by locality

Men

Women



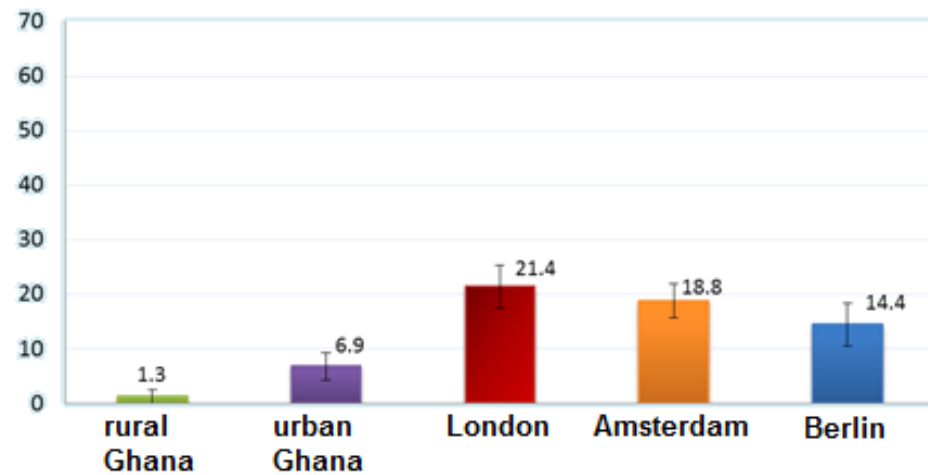
Agyemang et al. *BMC Medicine* 2016



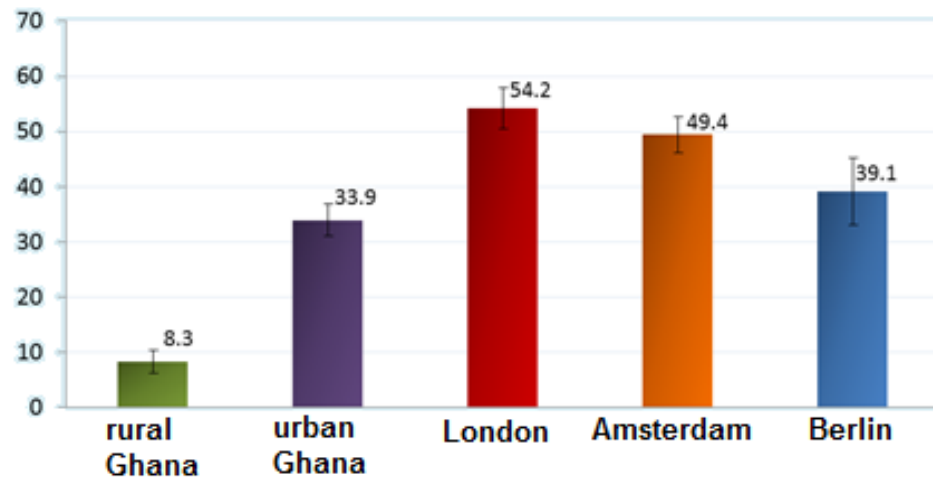


# Age-standardised prevalence of obesity (BMI $\geq$ 30kg/m<sup>2</sup>) by locality

Men



Women

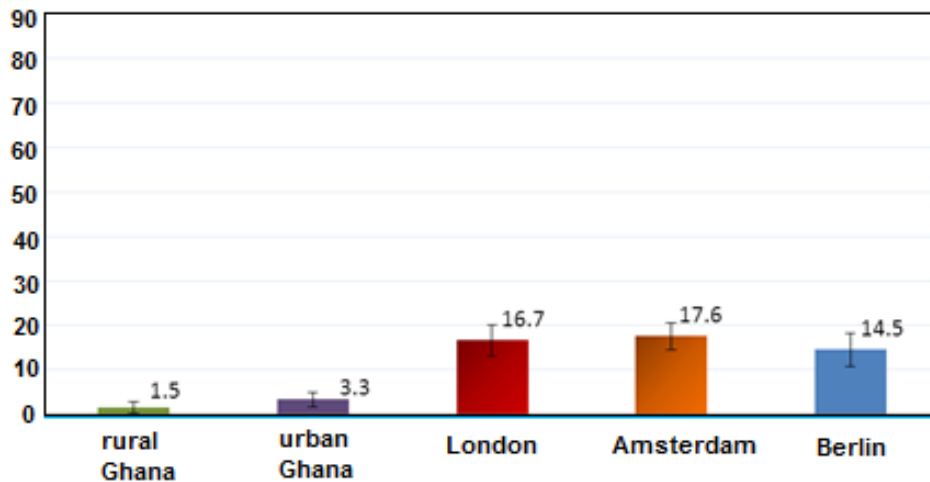


Agyemang et al. *BMC Medicine* 2016

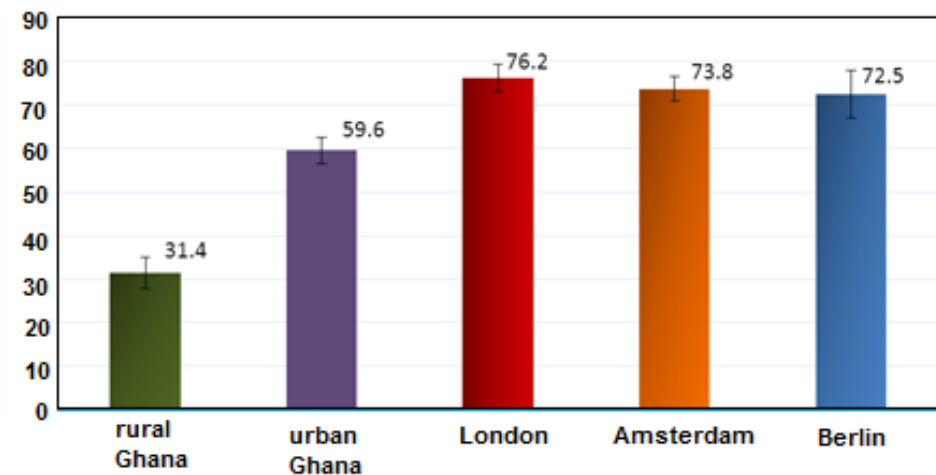


# Age-standardised prevalence of abdominal obesity (waist) by locality

Men



Women

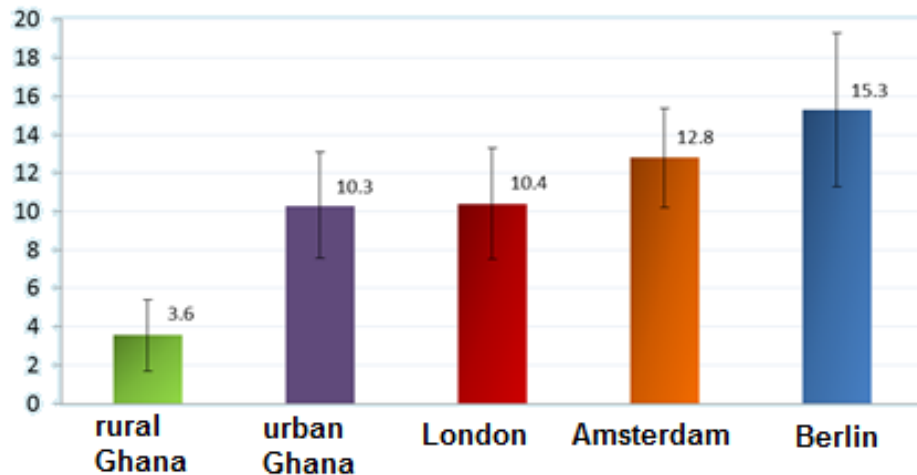


Agyemang et al. *BMC Medicine* 2016

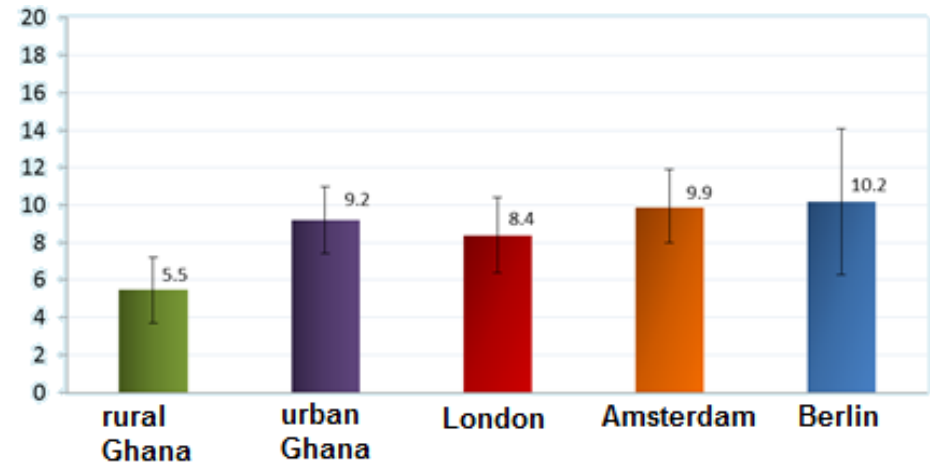


# Age-standardised prevalence of type 2 diabetes (WHO criteria) by locality

Men



Women



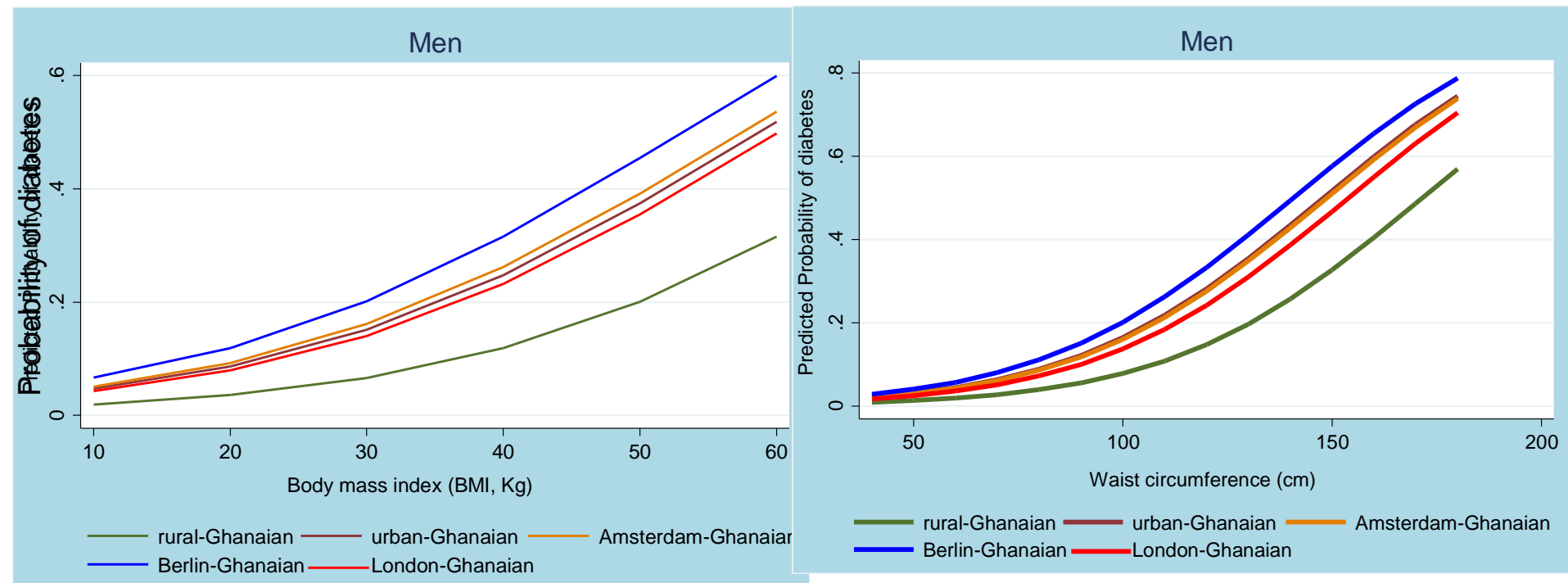
Agyemang et al. *BMC Medicine* 2016



# Age-adjusted predicted probability of diabetes by BMI and Waist in men by locality

BMI

Waist circumference

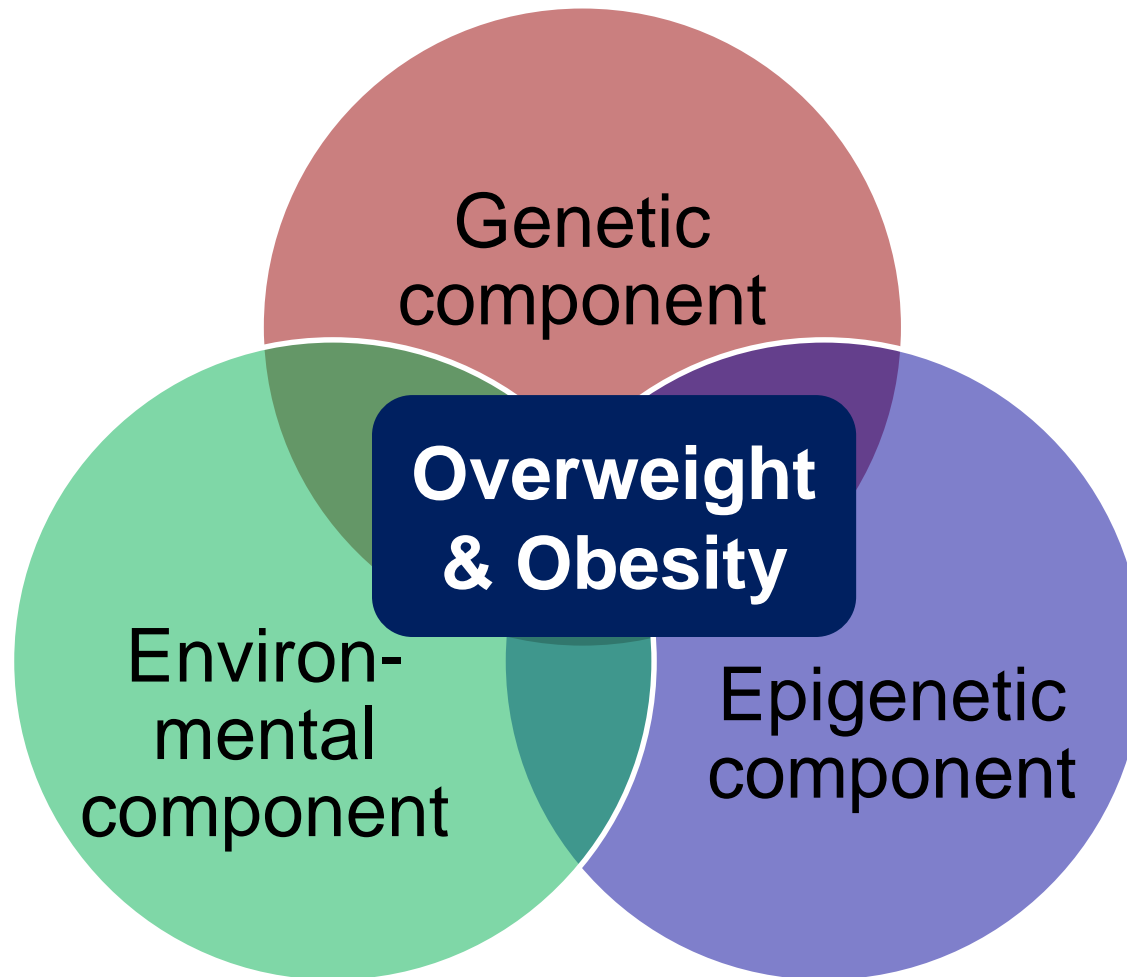


Agyemang et al. *BMC Medicine* 2016

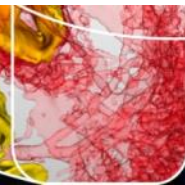




# Underlying factors



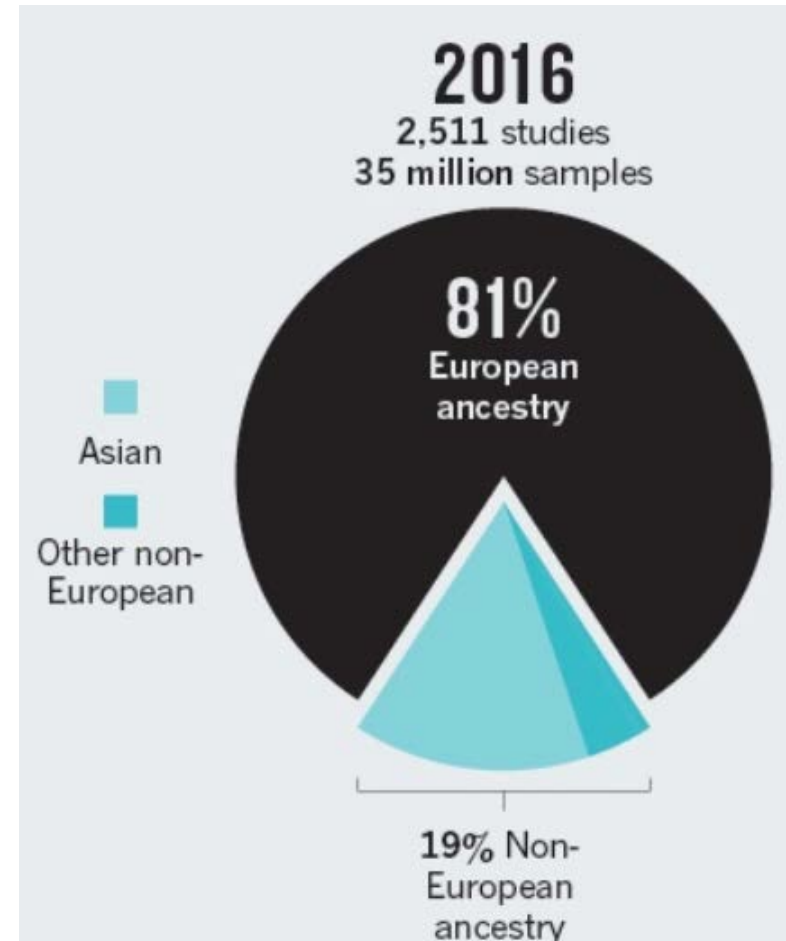
# Environmental component





# Genetic component

- Over 80 loci associated with polygenic obesity
- Explain only small fraction of heritability
- Limited data on Africans

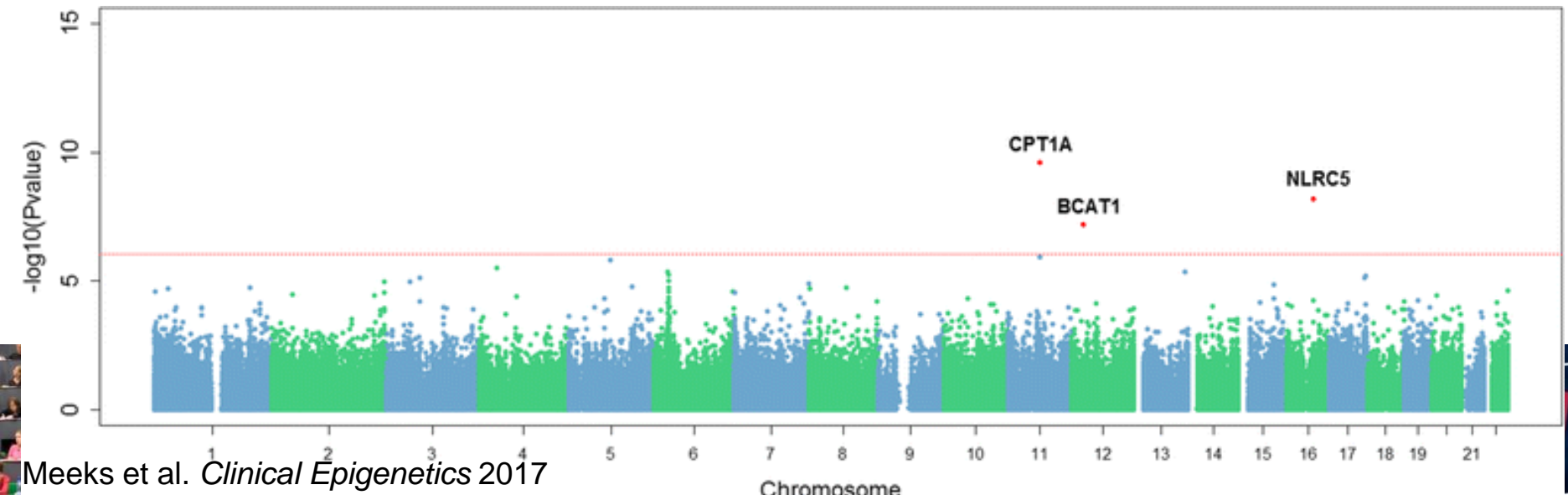
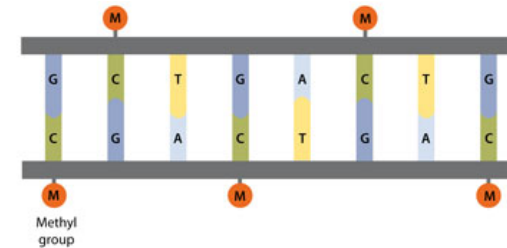
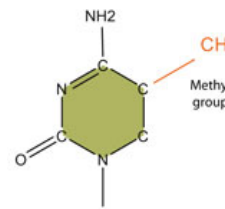


Popejoy & Fullerton *Nature News* 2016



# Epigenetic component

- Epigenetics = cellular mechanisms that regulate gene expression
- Lifestyle can alter epigenetics
- Epigenetics associated with obesity in the RODAM study
  - Novel loci associated with obesity in Africans identified





# Key messages

- High burden of overweight + obesity among African migrants in Europe
- Increasing burden of overweight + obesity in African region
  - Lower burden observed 10 years ago among Ghanaians in Ghana is no longer the case, especially among women
- Obesity independent risk factor for diabetes but context matters
  - Rural Ghanaians seem to be more protected from developing diabetes given similar level of BMI
- Need to unravel the complex interplay between genetic and environmental determinants of obesity in Africans



# RODAM partners

## Amsterdam

- AMC (Coordinating center)

## Berlin

- Charité - Universitätsmedizin Berlin
- German Institute of Human Nutrition Potsdam

## London

- London School of Hygiene & Tropical Medicine

## Ghana

- University of Ghana
- Kwame Nkrumah University of Science & Technology, Ghana

## IDF, Africa Region

## SME

- SourceBioscience, Nottingham



# Thanks!

[www.rod-am.eu](http://www.rod-am.eu)

