

Adiposity and the risk of infectious diseases in Chinese and UK adults

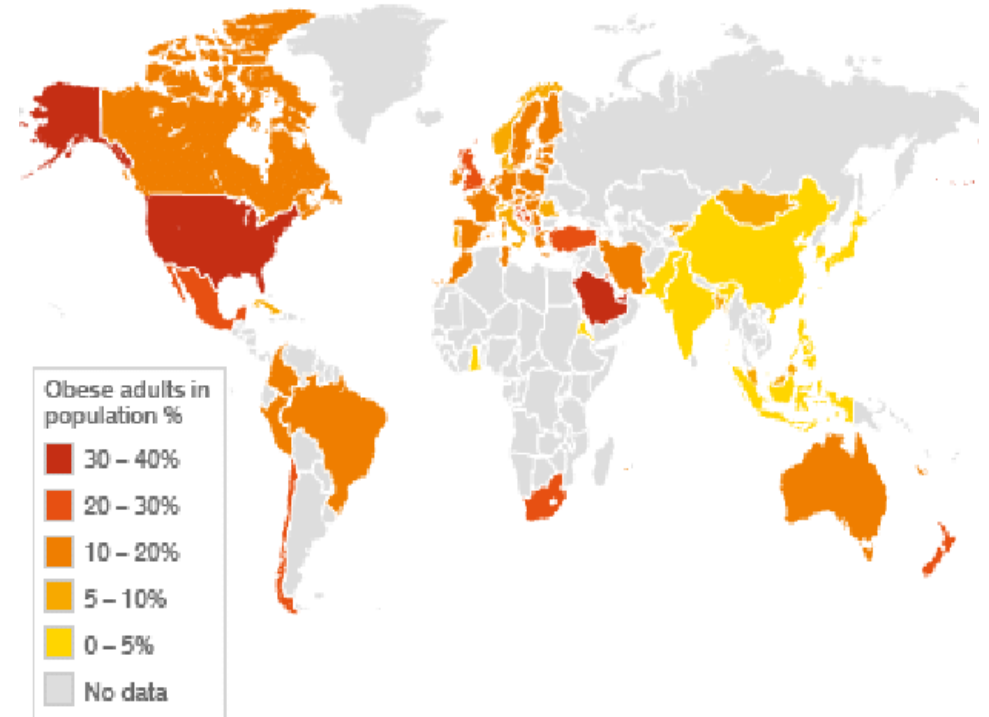
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Background

- Escalating rates of excess adiposity globally
- The implications for infectious disease risks are unclear
- Few studies investigating the full spectrum of infectious diseases
- No studies have compared across ethnic groups
- **Aim**: To investigate the observational associations between adiposity measures and the incidence and mortality of infectious diseases, using data from the China Kadoorie Biobank and UK Biobank.

THE GLOBAL OBESITY PROBLEM



An obese adult is classified as having a Body Mass Index equal to or greater than 30

SOURCE: World Health Organization, 2005

China Kadoorie Biobank (CKB) and UK Biobank (UKB)

biobank^{uk}

- 502,504 participants
- 40-69 years old at recruitment (2006-2010)
- 22 assessment centers
- Follow-up through health insurance, primary care, and death and disease registries (restrict the analysis until 2019)
- Obesity: 24%; Overweight: 40%



- 512,726 participants
- 30-79 years old at recruitment (2004-2008)
- 10 localities (5 urban, 5 rural)
- Follow-up through health insurance databases and death and disease registries until 2019
- Obesity: 4%; Overweight: 28%

Methods

Population

- ❖ History of doctor-diagnosed tuberculosis at baseline
- ❖ History of doctor-diagnosed or screen-detected chronic diseases at baseline
- ❖ Self-reported poor health
- ❖ Missing or extreme values of adiposity measures

Exposure

- Body mass index (BMI), waist circumference, waist-hip-ratio, body fat percentage, fat-free body mass

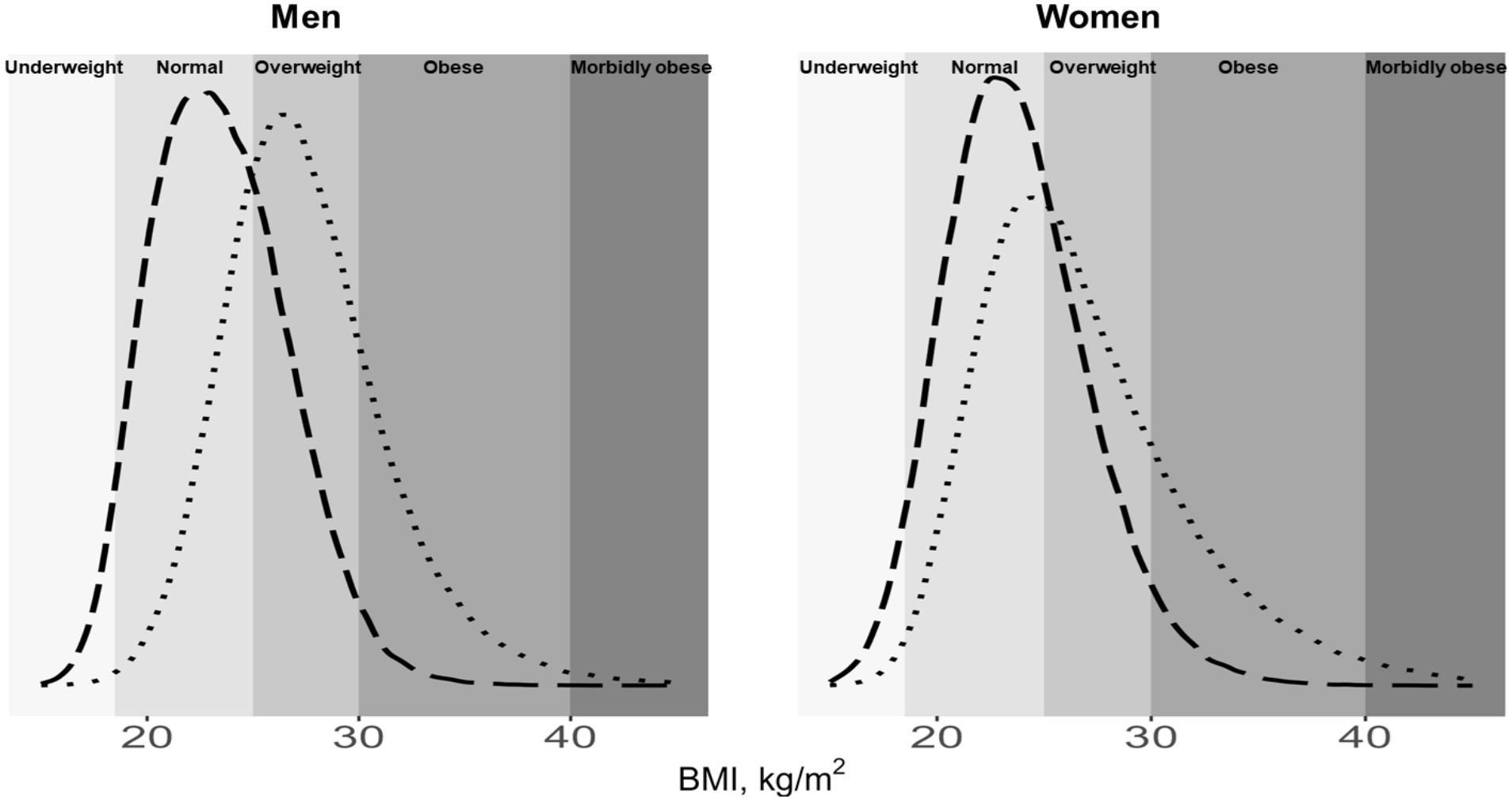
Outcomes

- Respiratory tract infections (upper and lower)
- Non-respiratory tract infections (hepatobiliary; gastrointestinal; genitourinary; skin, soft tissue, and bone; sepsis; other infections)

Analysis

- Cox proportional hazards model
- Stratified for age-at-risk, sex, region; adjusted for smoking, alcohol, education, income

BMI Distribution in CKB and UKB



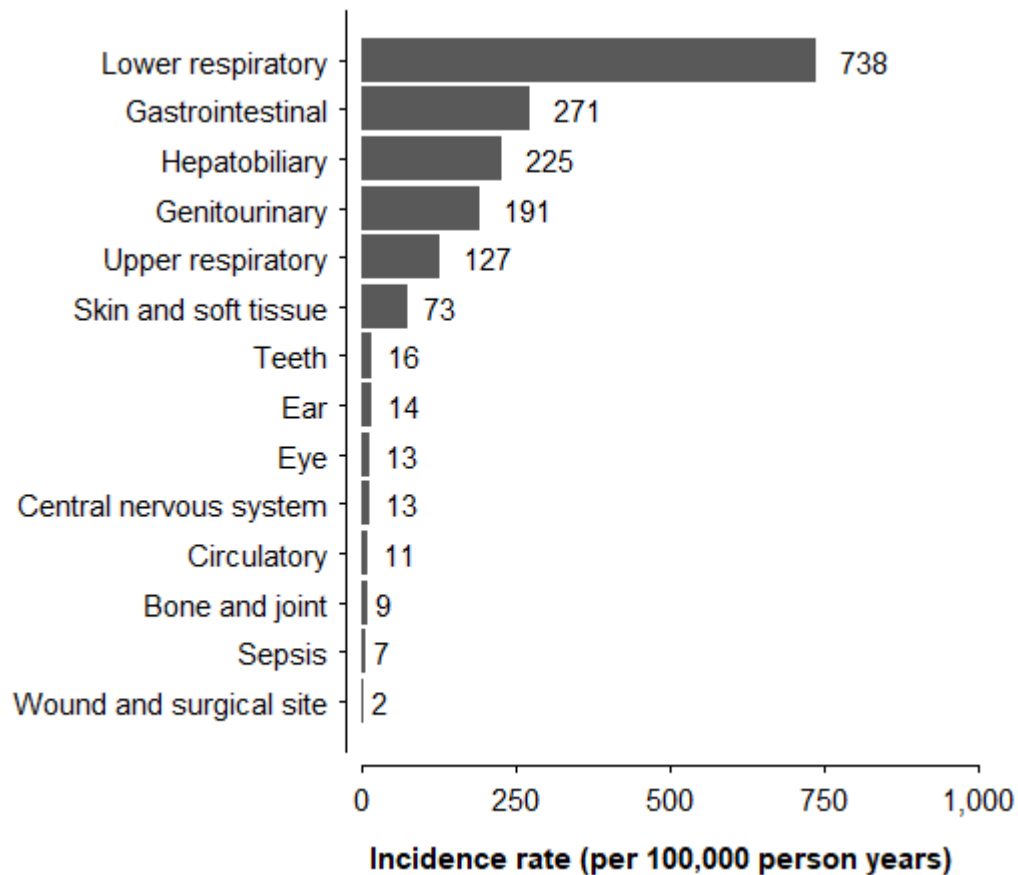
— China Kadoorie Biobank · · UK Biobank

Infectious disease incidence in CKB and UKB

CKB

N = 380,846

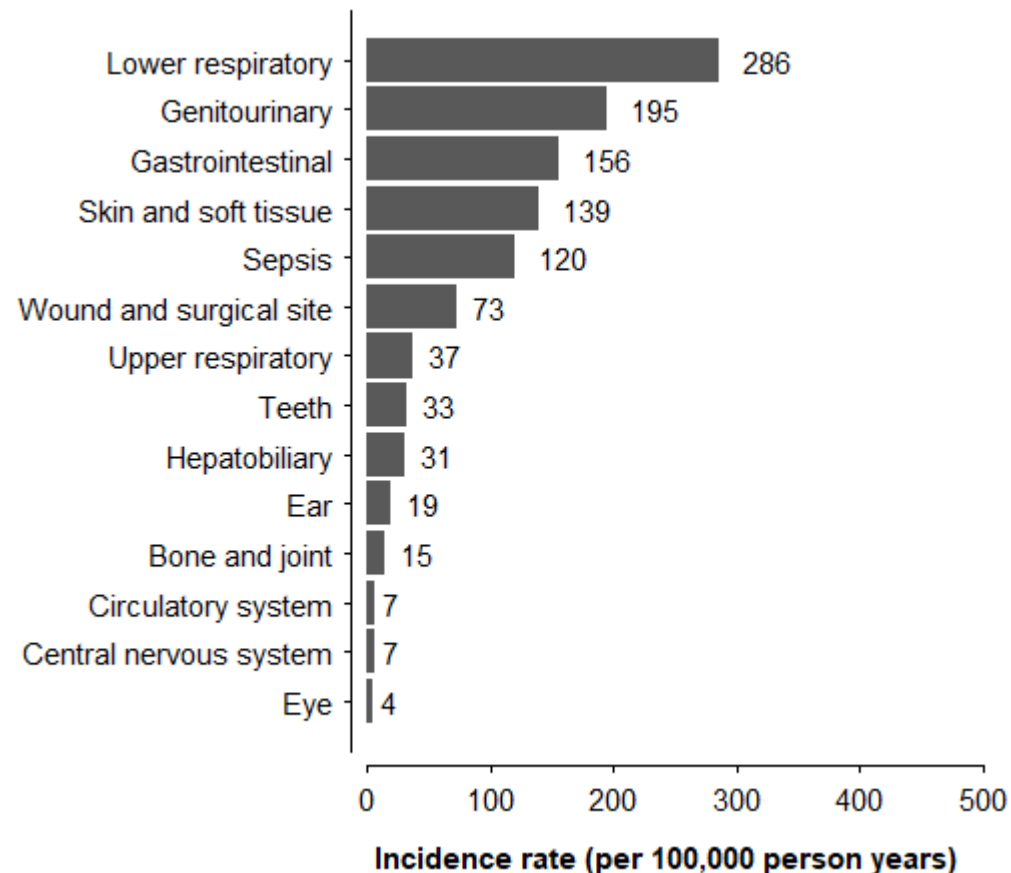
Median follow-up: 11.8 years



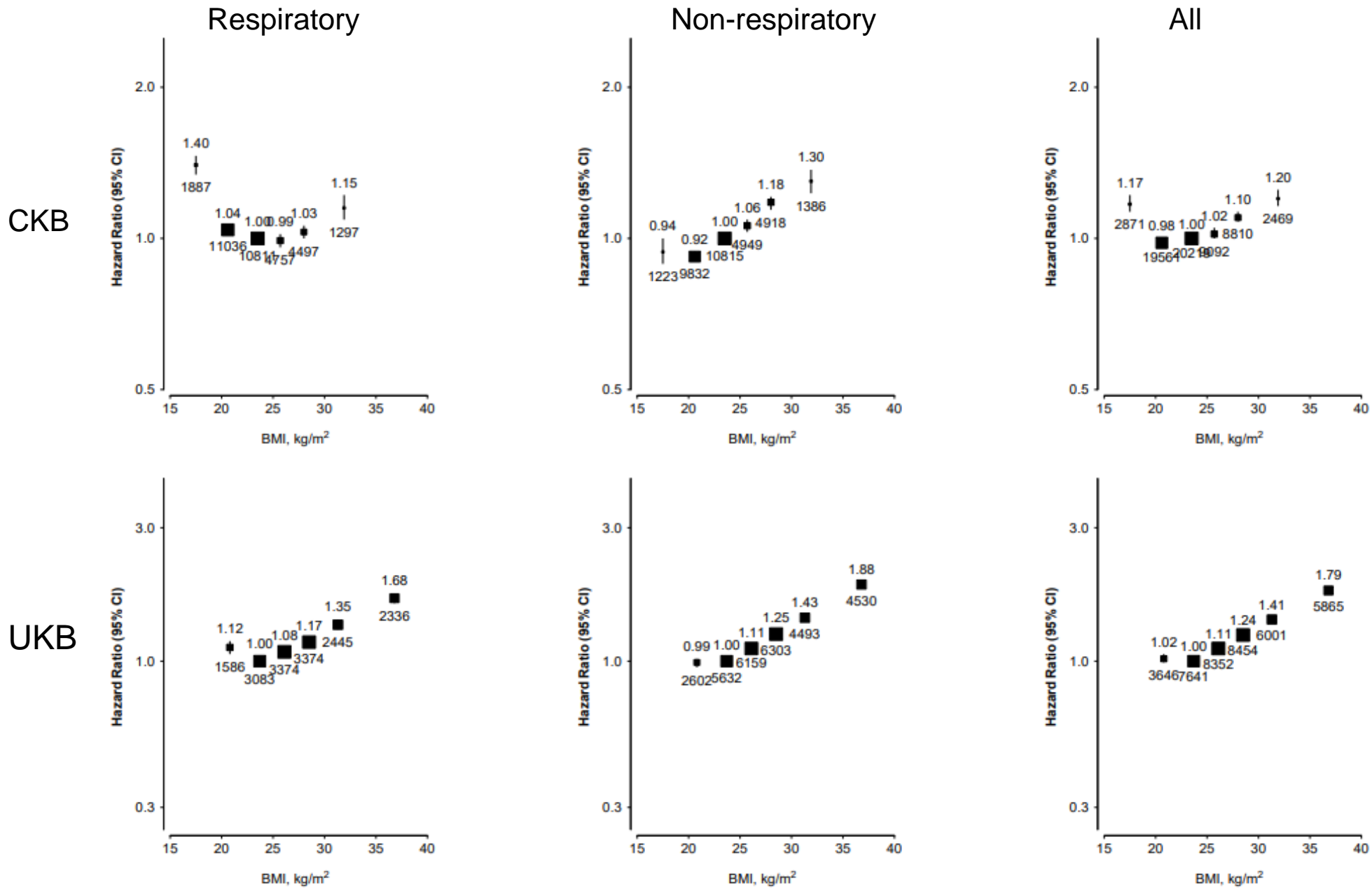
UKB

N = 392,373

Median follow-up: 10.7 years

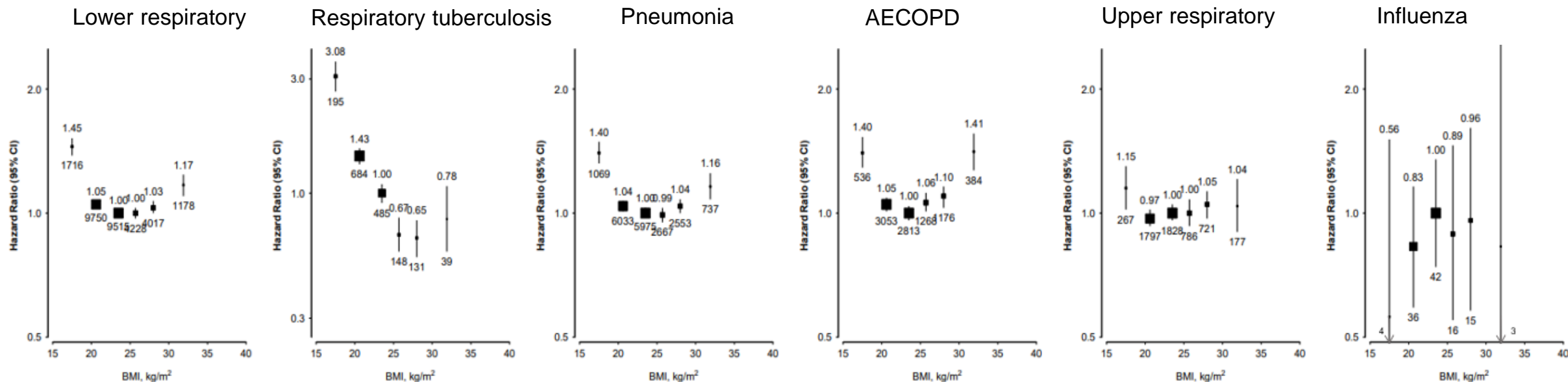


BMI and risk of incident infectious diseases

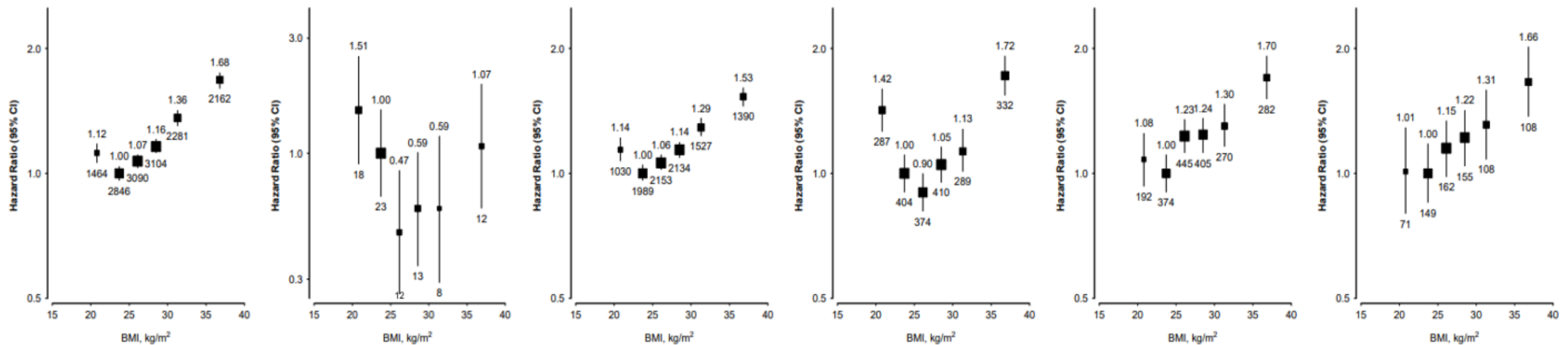


BMI and risk of incident respiratory tract infectious diseases

CKB



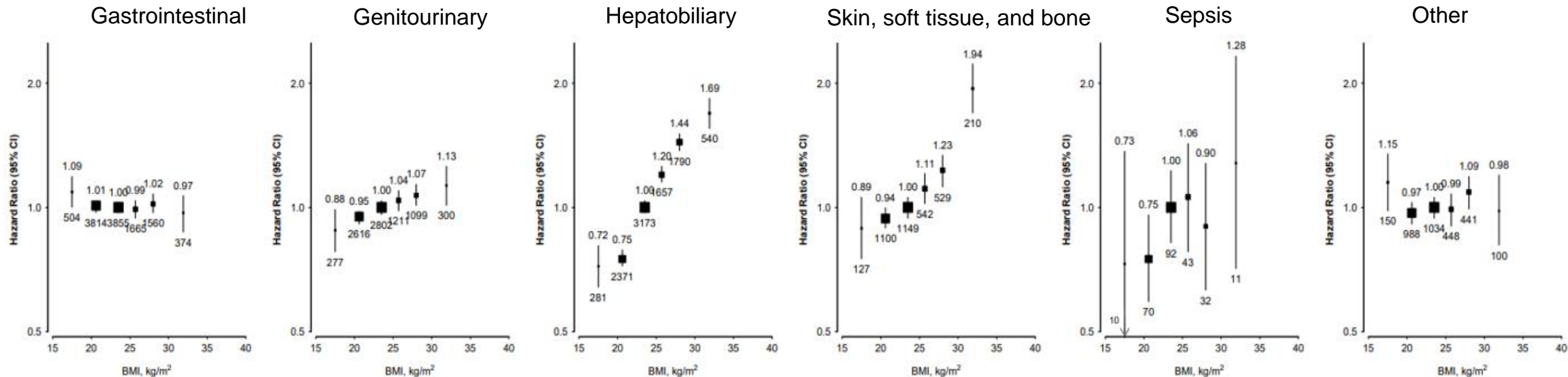
UKB



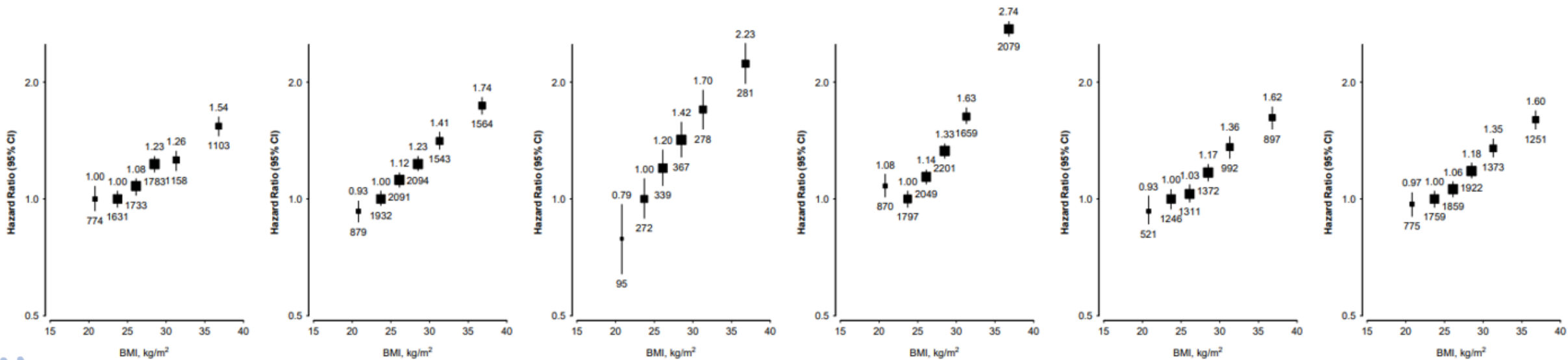
Note: the y-axis for respiratory tuberculosis is different due to the large effect size
AECOPD = acute exacerbation of chronic obstructive pulmonary disease

BMI and risk of incident non-respiratory tract infectious diseases

CKB



UKB



BMI and risk of incident infectious diseases by sex

Women

Men

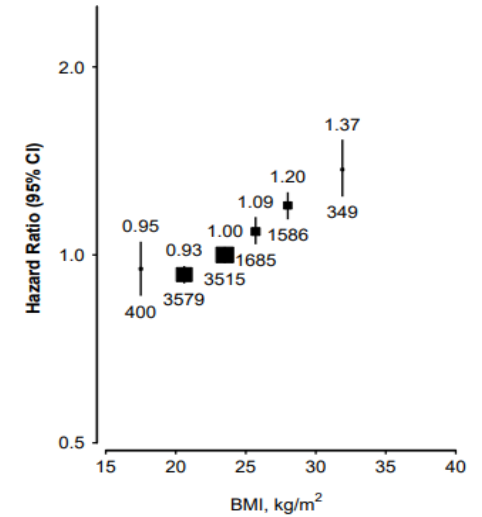
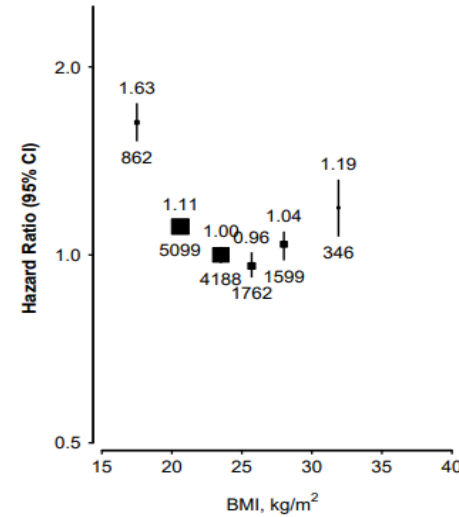
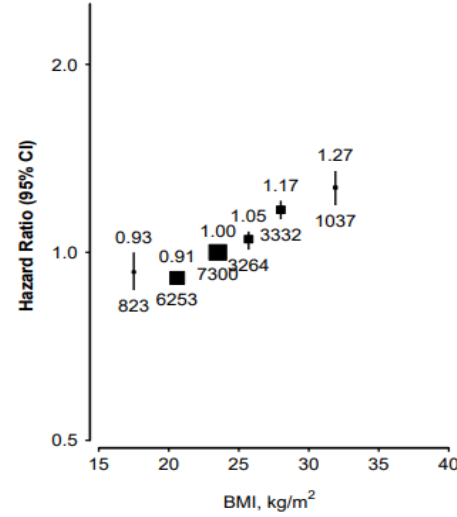
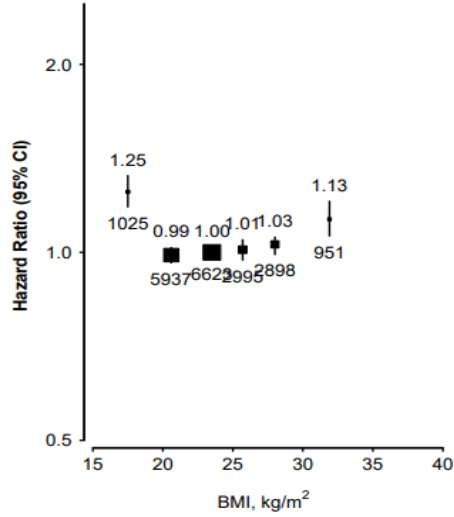
CKB

Respiratory

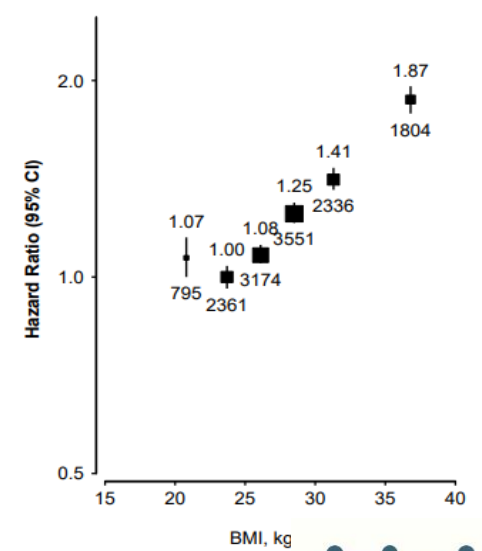
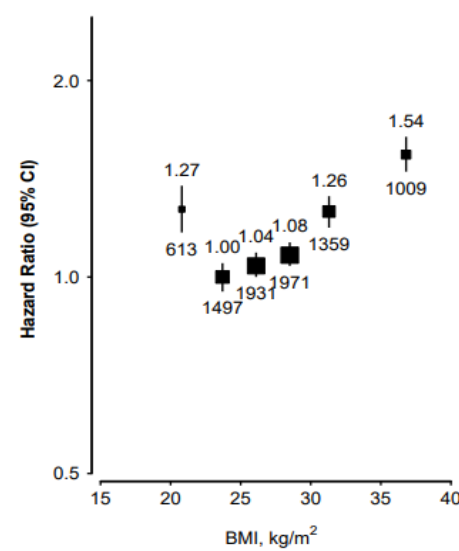
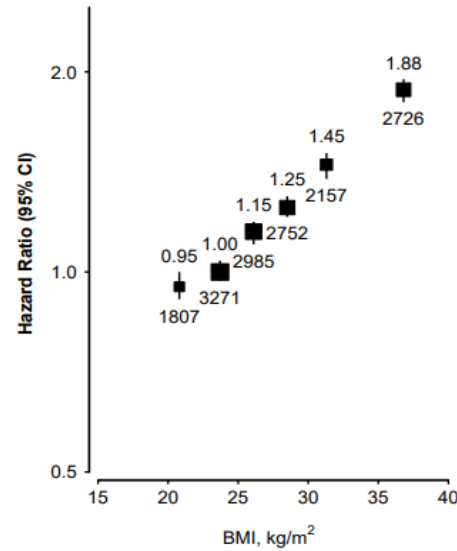
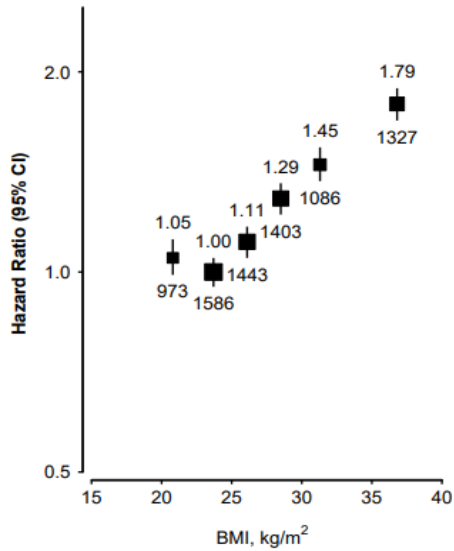
Non-respiratory

Respiratory

Non-respiratory



UKB

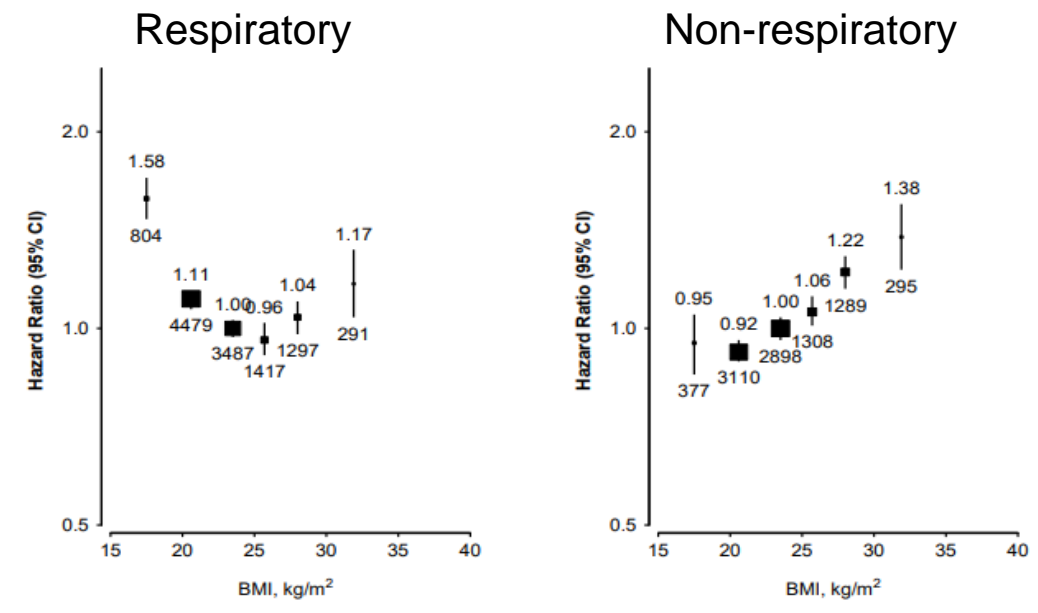
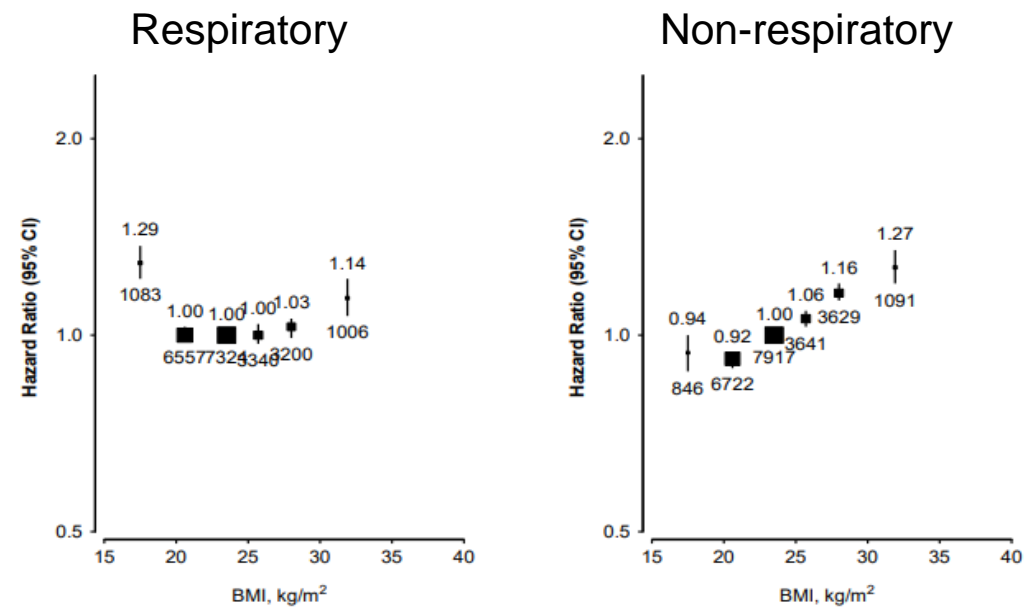


BMI and risk of incident infectious diseases by smoking status

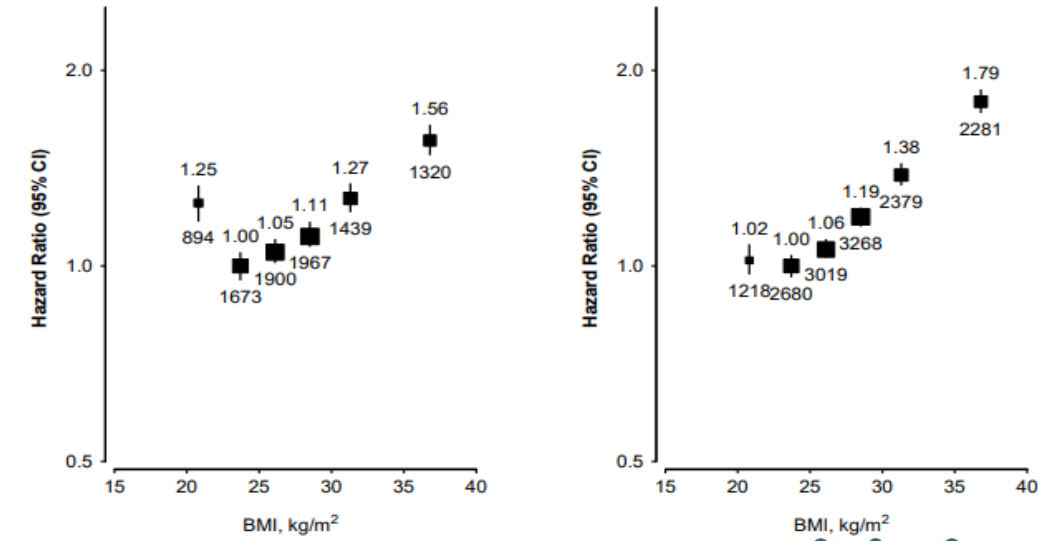
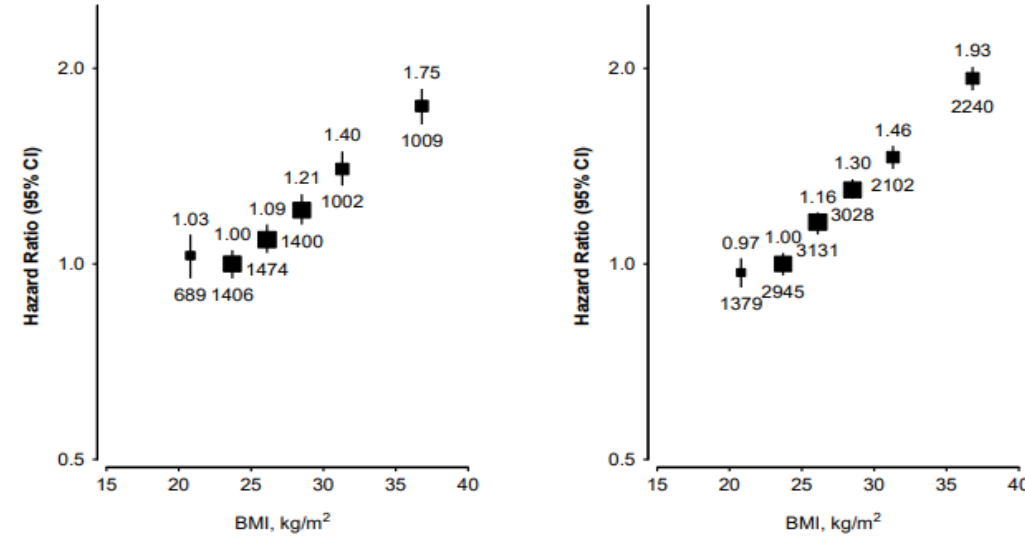
Never smoker

Ever smoker

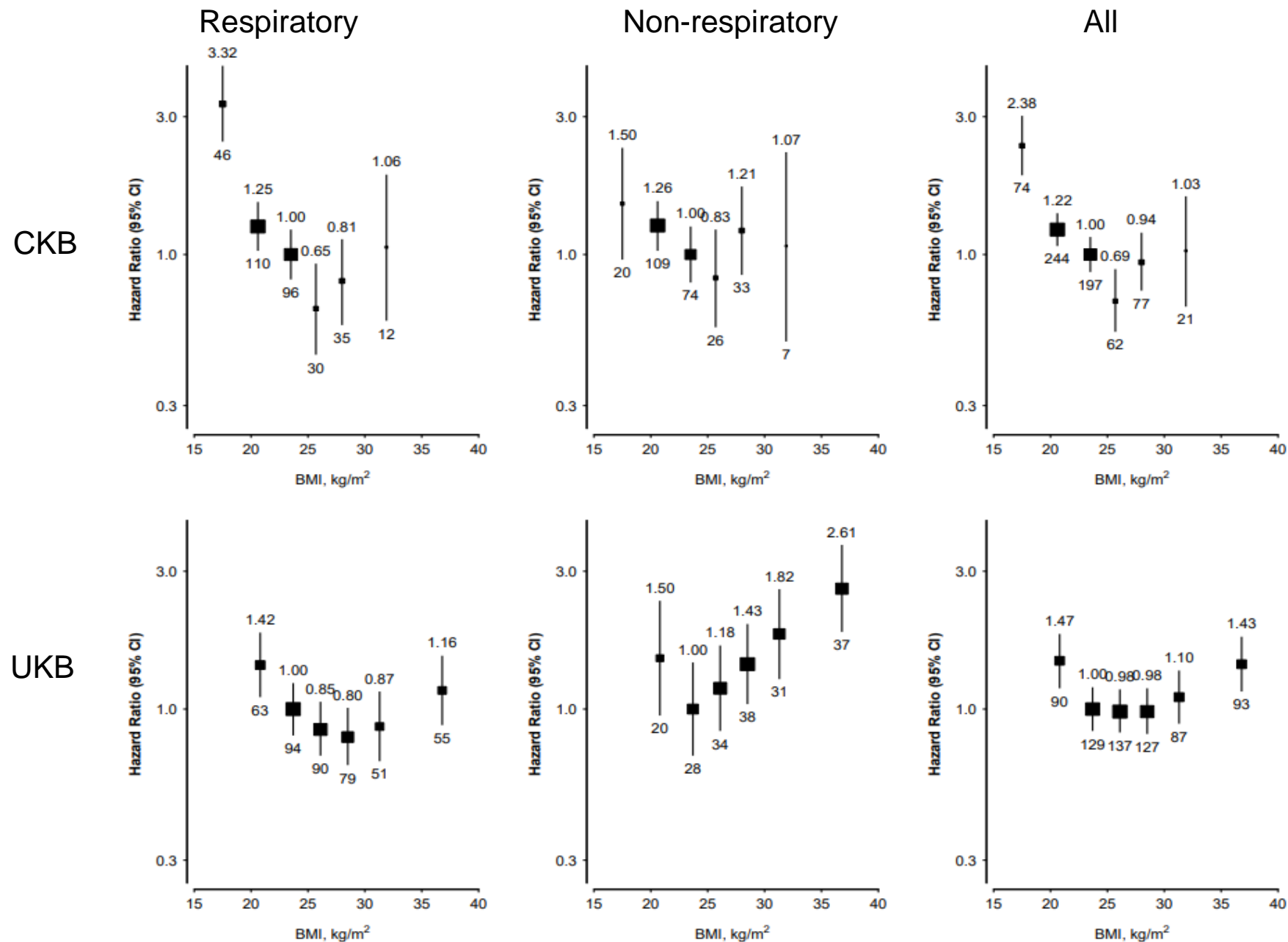
CKB



UKB



BMI and risk of infectious disease mortality



Conclusion

- U-shaped association of BMI with risk of incident respiratory tract infections
- Reverse J-shaped association with mortality with excess risk at low BMI
- Positive log linear association with most non-respiratory tract infections, stronger in UKB than CKB

Implications

- Highlights the importance of weight management strategies
- Lays the groundwork for future investigations into the mechanisms underlying the association
- Provides insights for shaping clinical guidelines and health policies
- Suggests tailored infectious disease prevention strategies, especially during the obesity epidemic

Thanks for listening