

# All-cause Years of Life Lost Across Norwegian Municipalities

A Pre-Pandemic 2019 Burden of Disease Study

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# Background - Norwegian Context

## Background

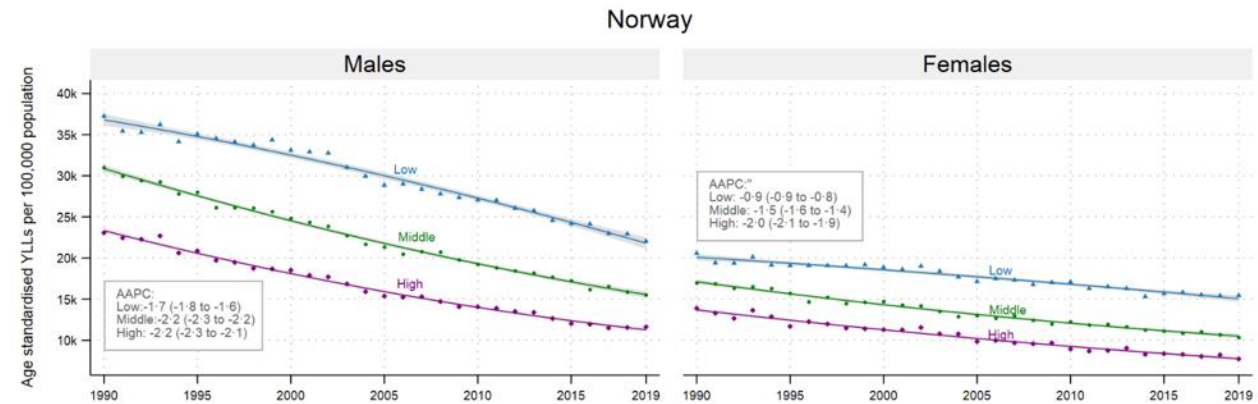
- 5.3 million people (2019)
- 18 counties and 425 municipalities (2019)
- Life expectancy at 83 years (2019)
- Low income inequality
- High levels of educational attainment



# Social Determinants of Health Disparities

## Background

- Persistent socioeconomic disparities in health at the Individual-level.



- Geographical inequalities at the regional level are less clear.

Antall DALY per 100 000 innbyggere, aldersjustert



# Study Aims

## Background

- Investigate geographical inequalities in premature mortality across Norwegian municipalities.
- Assess factors driving these disparities.



# Study Design and Data Sources

## Methods

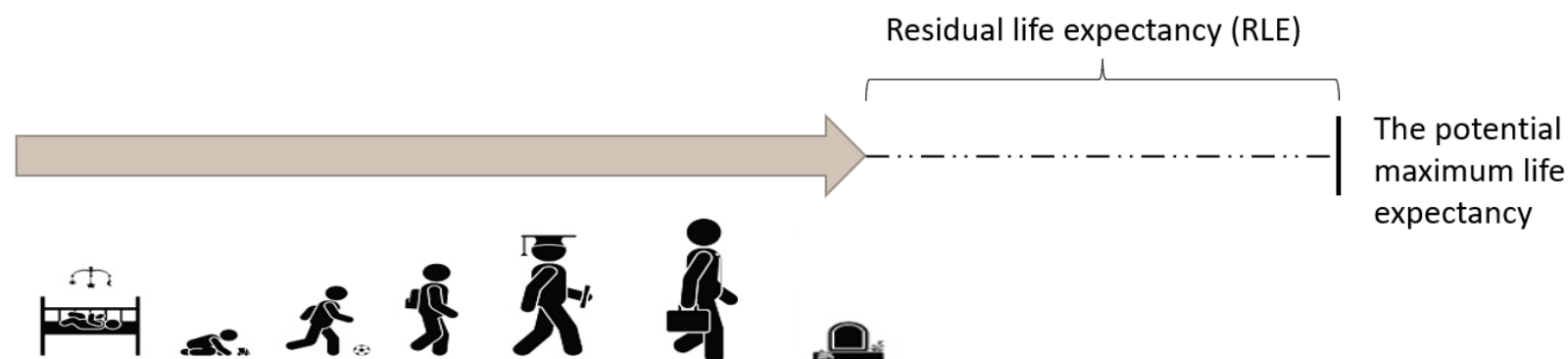
- Registry-based burden of disease and ecological study, all municipalities with populations of 1,000+ (n=393).
- All-cause mortality, demographics, socioeconomic indicators, and centrality from National Population Register and Statistics Norway



# Years of life lost (YLLs) - Framework

## Methods

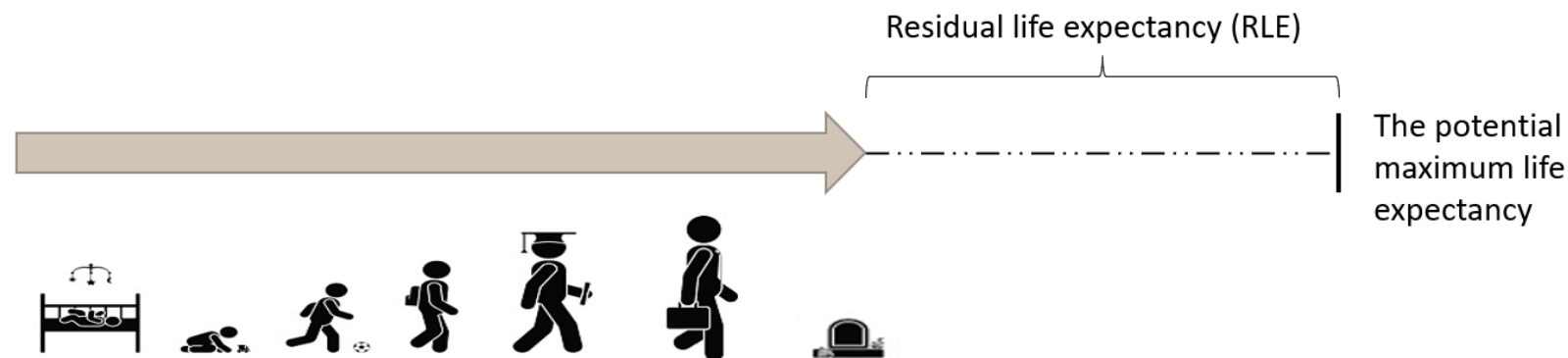
- GBD Study highlights premature mortality as a key public health indicator.
- YLLs quantify the burden of premature mortality, accounting for frequency and age at death.



# Years of life lost (YLLs) - Calculation

## Methods

- Age-specific mortality counts were multiplied by aspirational life expectancy from GBD 2019 life tables.
- The GBD standard life expectancy based on the lowest age-specific death rates in populations over 5 million representing an "ideal" standard.



# Deprivation

## Methods

- Educational level: **compulsory education** (ISCED 0-2) aged 20+ per municipality
- Income: **equivalised post-tax household income** per municipality
- Each municipality was categorised as **urban, intermediate, or rural**.





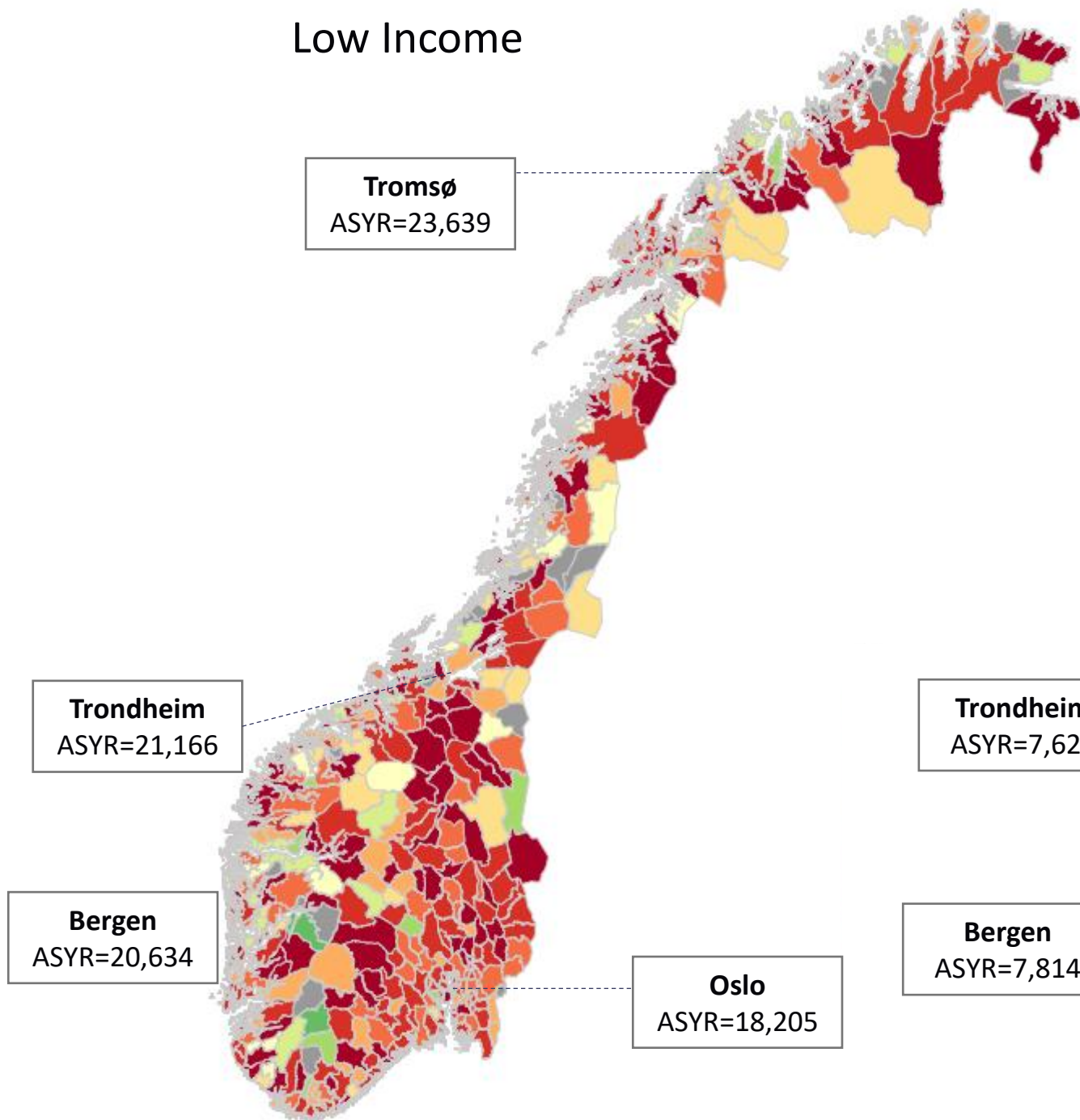
# Statistical Analysis

## Methods

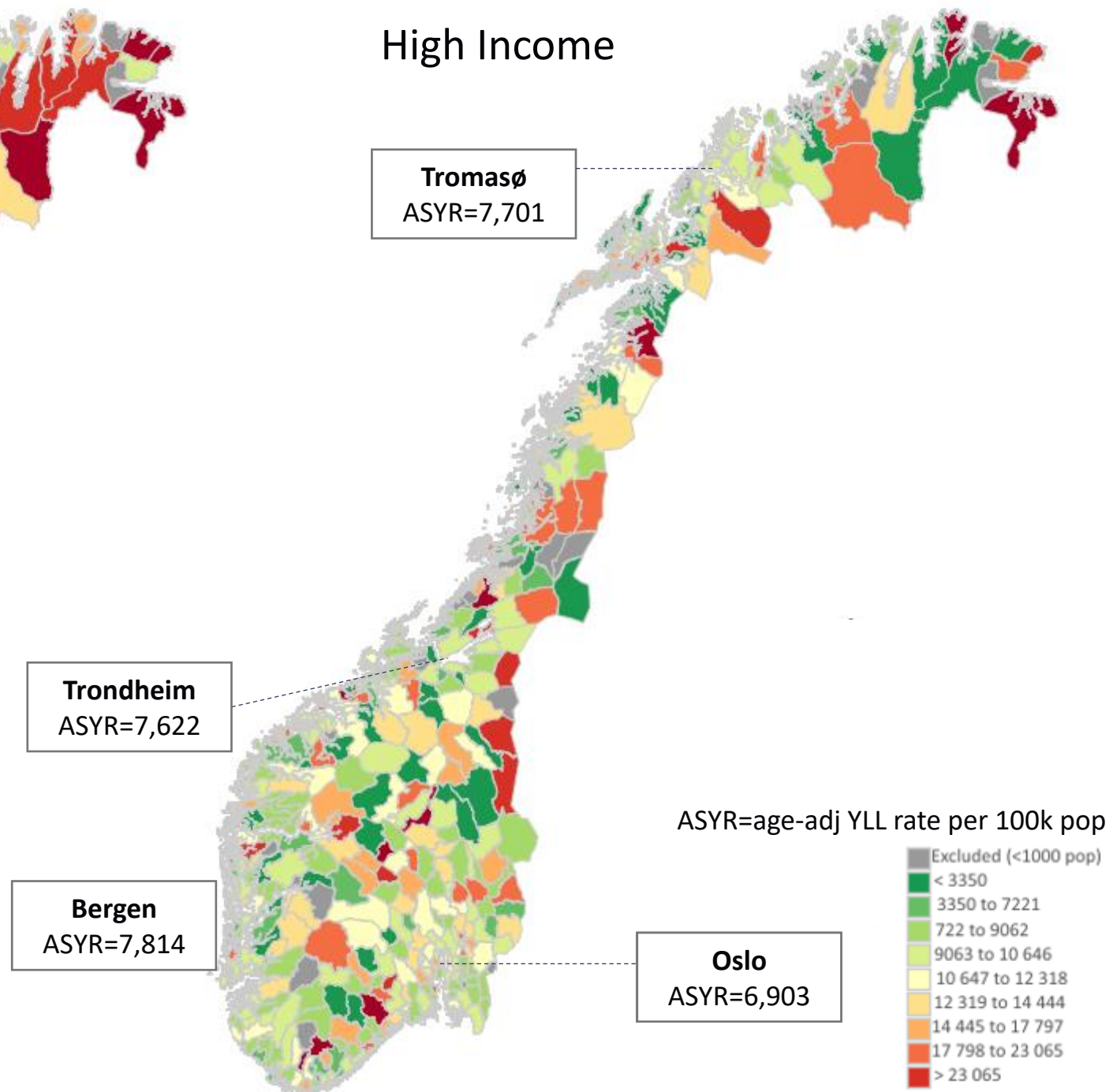
- Age and sex adjusted negative binomial regression models for relative associations, at the level of the municipality.
- Marginal mean differences for Poisson distributions for absolute inequalities with the same adjustments



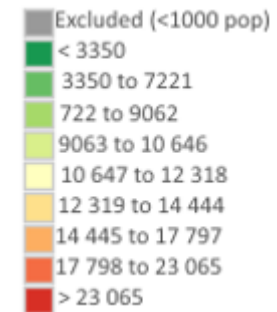
## Low Income



## High Income

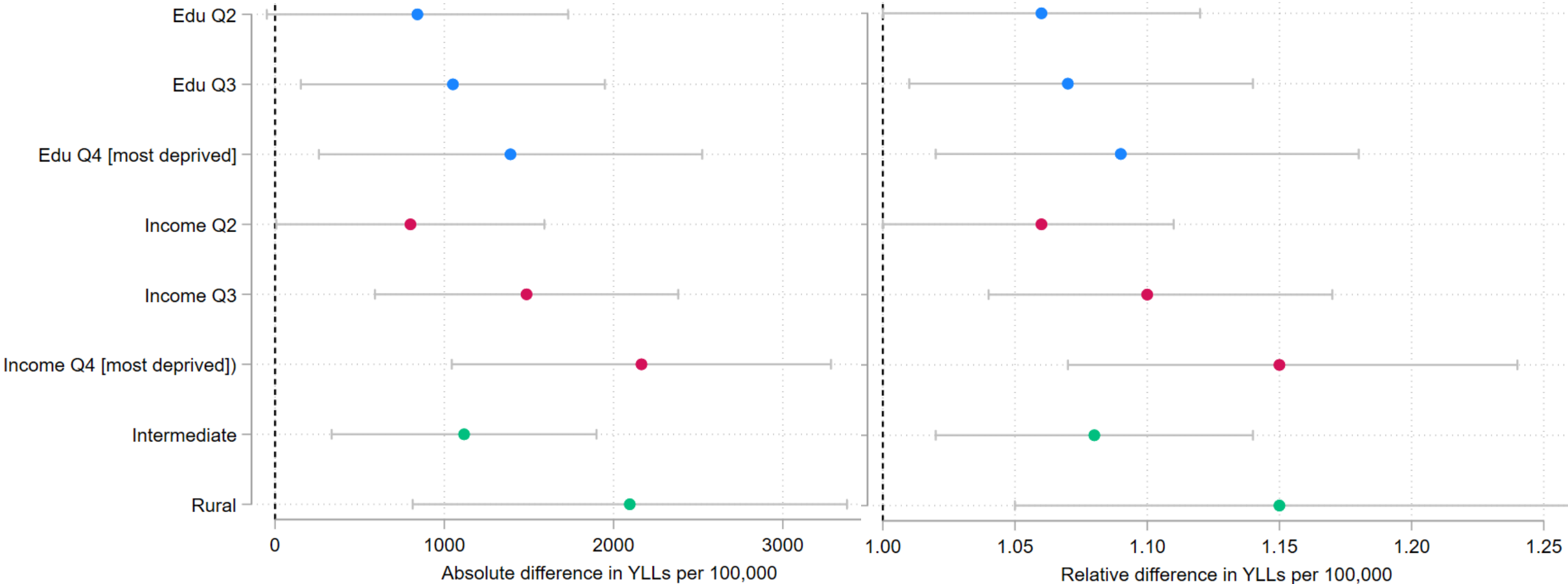


ASyr=age-adj YLL rate per 100k pop



## Absolute differences

## Relative differences



Adjusted for age categories & sex  
Reference = Least deprived / Urban

# Key findings

## Conclusions

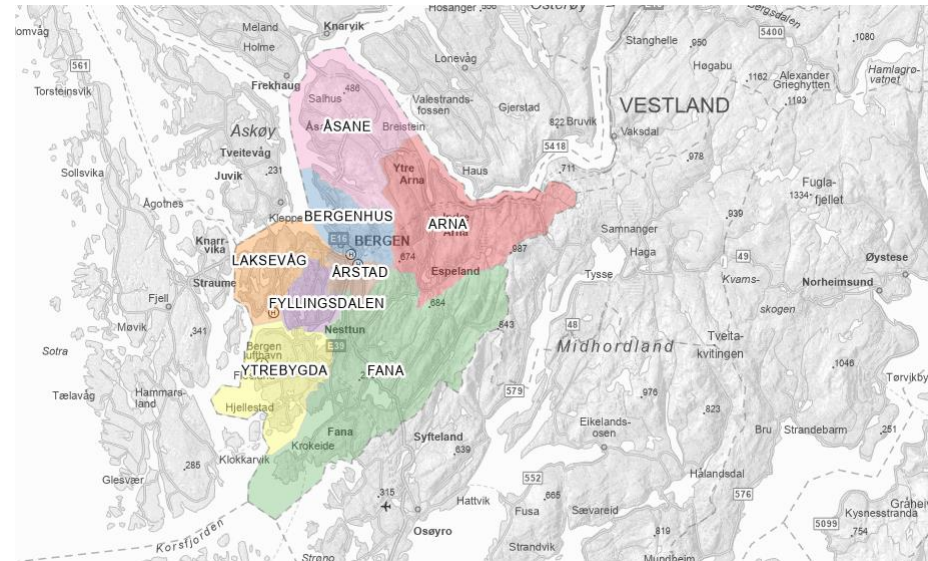
- County-level analyses often obscure municipal disparities in premature mortality; local analyses are essential.
- Significant disparities in premature mortality between high- and low-deprivation municipalities: with between 1,400 to 2,200 years of life lost difference.



# Methodolcal Considerations

## Conclusion

- Potential to extend the study to suburbs of major cities, cause-specific outcomes, non-fatal BoD metrics, PAFs



# Policy Implications

## Conclusion

- Under § 5 of the Public Health Act (2012): municipalities are mandated to monitor health and address social health disparities.
- Overall, BoD methods applied to municipality level data which explores socioeconomic correlates offer valuable insights for targeted public health policies.

## Thankyou

Contact me

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