

**Sexual orientation identity and type II diabetes: individual participant meta-analysis of 3,580 cases among 100,503 individuals from fourteen health surveys in the UK**

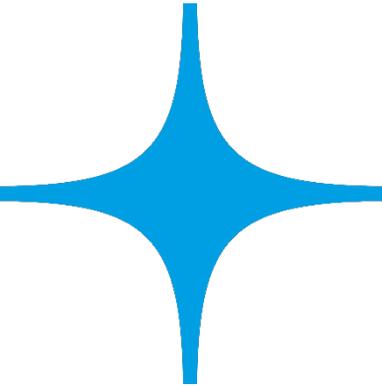
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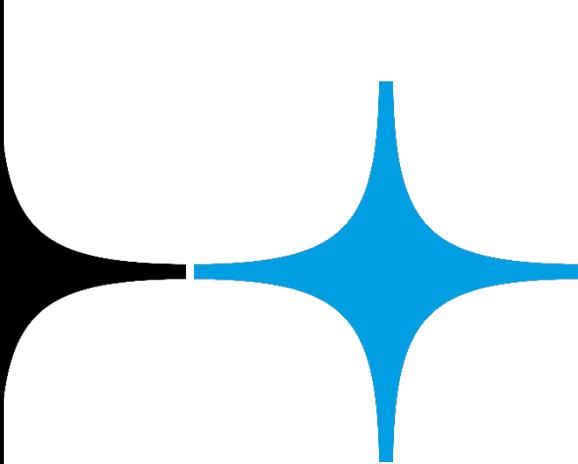
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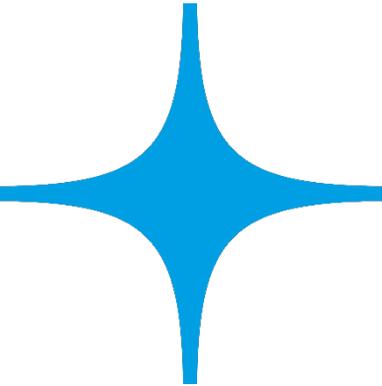
## BACKGROUND

- Monitoring health inequalities are an important component of public health policy.
- Recording of sexual orientation identity is necessary to allow monitoring of sexual minority health - complies with equal opportunities legislation.



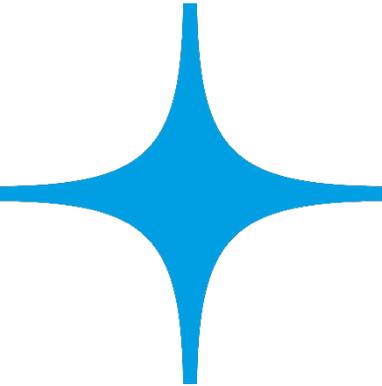
## INTRODUCTION

- LGB increased risk of poor mental health including suicidality, substance misuse and self harm (Systematic review, King et al 2008)
- LGB young adults more likely to smoke (LSYPE, Hagger-Johnson et al., 2013)
- 80% of LGB individuals experience some form of harassment in their lives (Katz-Wise & Hyde, 2012)
- 'Minority stress' theory posits that internal and external manifestations of prejudice, victimization, and social stigma underlie health differences - offers possible explanation (Meyer, 2003)



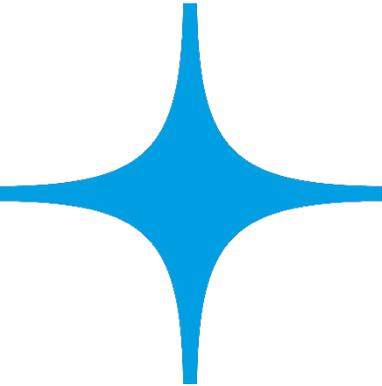
## QUALITY OF LGBO HEALTH INEQUALITIES RESEARCH

- Impoverished evidence base
- Poor quality papers, small and community samples, snowball sampling, unvalidated materials, and repetition.
- Unfunded research, unpublished studies, under-researched population, poorly funded.
- US-centric field
- Variability in identity measures (attraction, behaviour, identity); aggregation



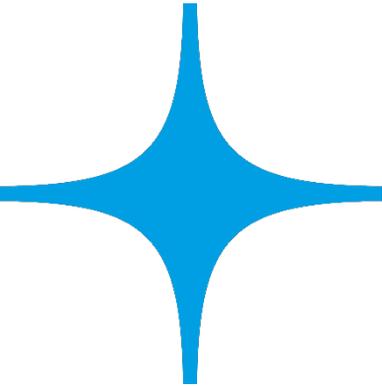
## UK LBGO DATA

- ONS standardized question created (2009)
- *'Which of the following options best describes how you think of yourself?'*  
Response options were 'Heterosexual or Straight', 'Gay or Lesbian', 'Bisexual', 'Other', or refusal.
- Included in eight UK national health surveys



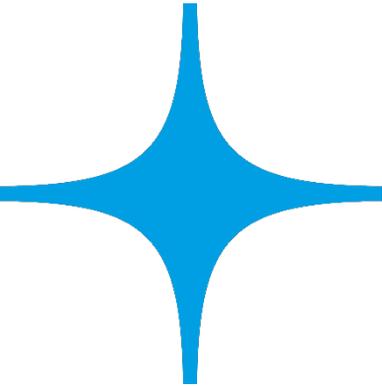
## **UK LGBO HEALTH DISPARITIES USING IPD WITH HEALTH SURVEYS (UK DATA SERVICE)**

- Common mental disorder (Semlyen 2016) – increased risk in L, G and B
- BMI (Semlyen et al 2019) – unhealthy weight in LB and GB
- Participants were drawn from 12 datasets from studies: British Cohort Study (2012), Scottish Health Survey (2008 to 2013), Health Survey for England (2011 to 2013), the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3, undertaken 2010-2012), Understanding Society (2011/12), Longitudinal Study of Young People in England (LSYPE) 2009/10



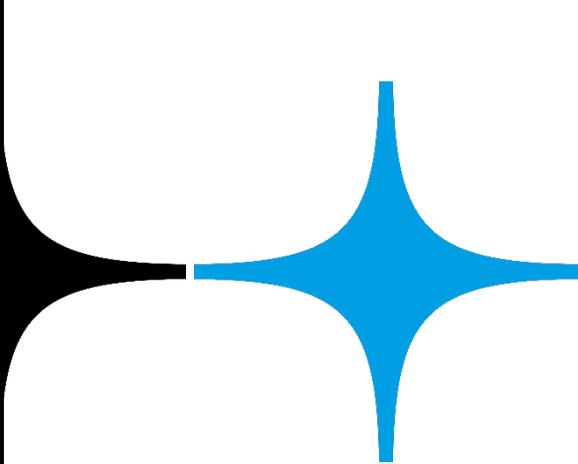
## AIM

To determine the association between Lesbian, Gay, Bisexual or 'Other' (LGBO) sexual orientation identity and type II diabetes among adults in the UK.



## STATISTICAL ANALYSIS

- We used individual participant data (IPD) meta-analysis with logistic regression to evaluate associations between LGBO categories and type II diabetes, adjusting for covariates
- Unlike most meta-analyses, this doesn't rely on aggregate data extracted from publications.
- Original data used from fourteen health surveys that collected data on LGBO categories and type II diabetes.
- Can estimate associations for smaller subgroups (e.g. LGBO categories) for which original studies were underpowered.



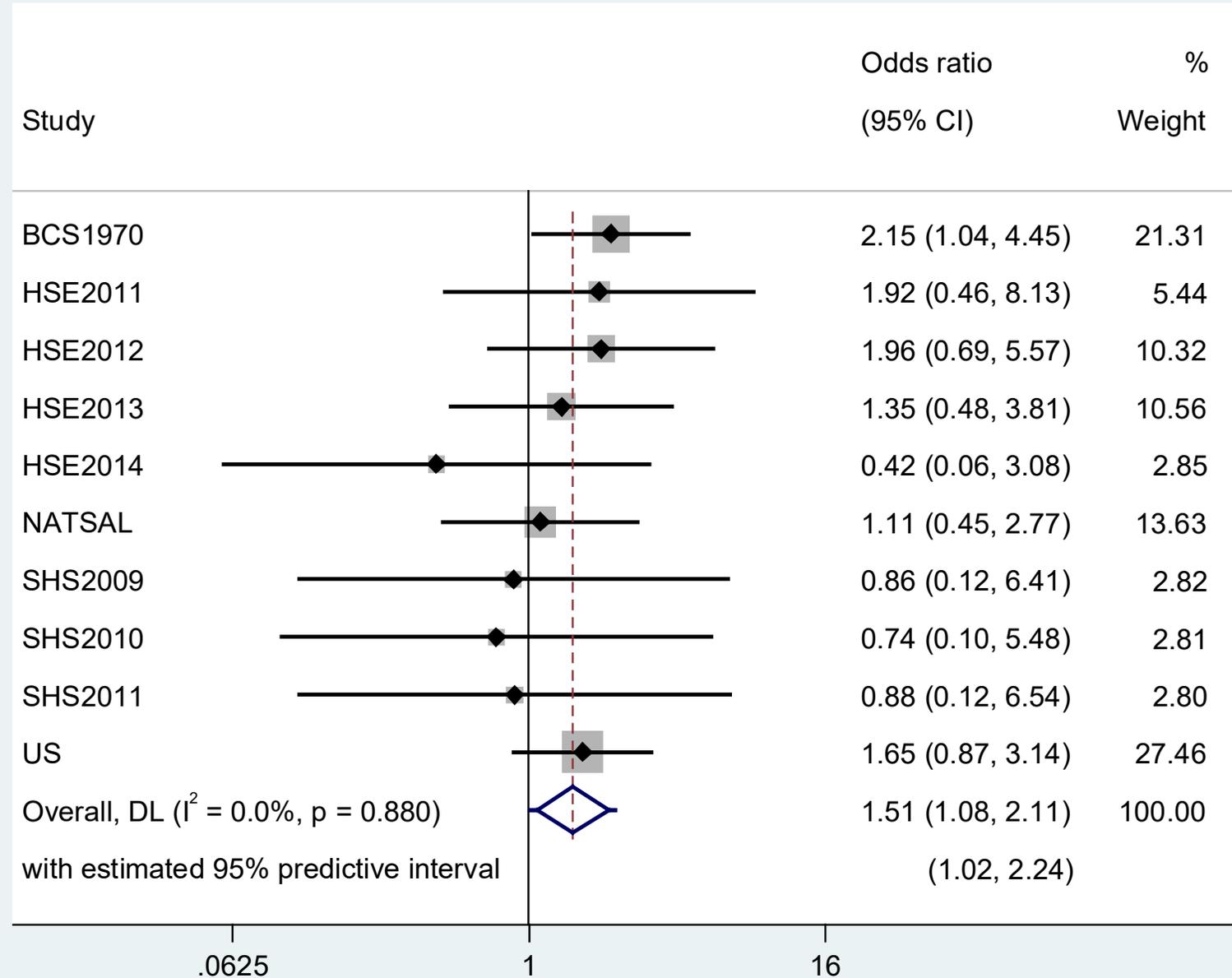
## STATISTICAL ANALYSIS (CONT.)

- Calculated summary statistics for each study before pooling these estimates, accounting for heterogeneity between studies.
- Used a random effects model – range of years and places, so reasonable to expect heterogeneity
- Odds ratios and their standard errors pooled to produce an estimate of the average effect size for the studies.
- In preliminary analyses, found no evidence that effects differed for men and women, so combined them for the main analyses (p-value for interaction not significant)

# COVARIATES

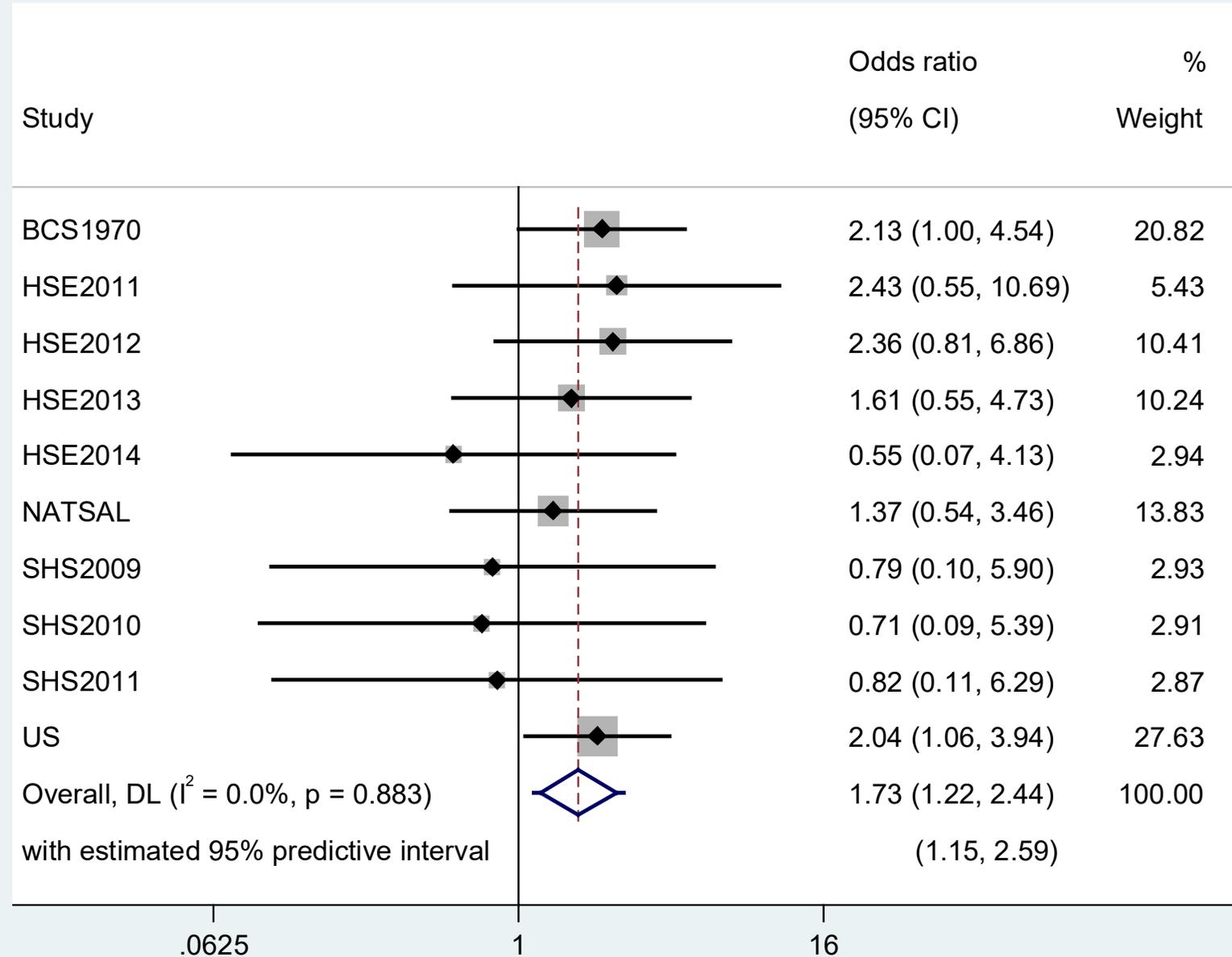
- Minimally adjusted analyses included age and sex
- Additionally adjusted analyses also included smoking, drinking over recommended limits, BMI category, ethnic minority status and education status
- Also considered marital/cohabiting status, consumption of five-a-day, physical activity and waist measurement. Too few studies had the last two.

# Gay/lesbian - minimally adjusted



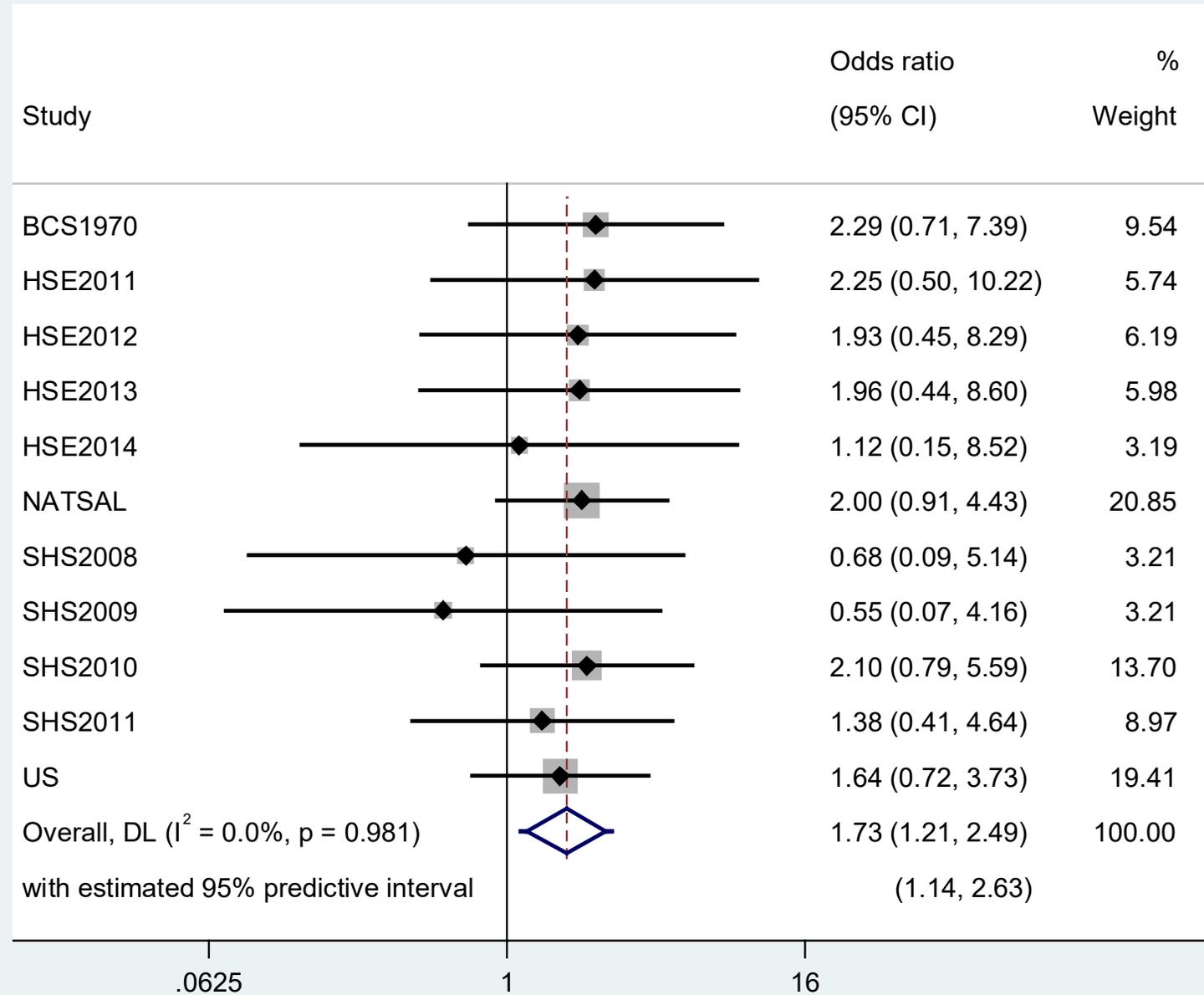
NOTE: Weights are from random-effects model

# Gay/lesbian - additionally adjusted



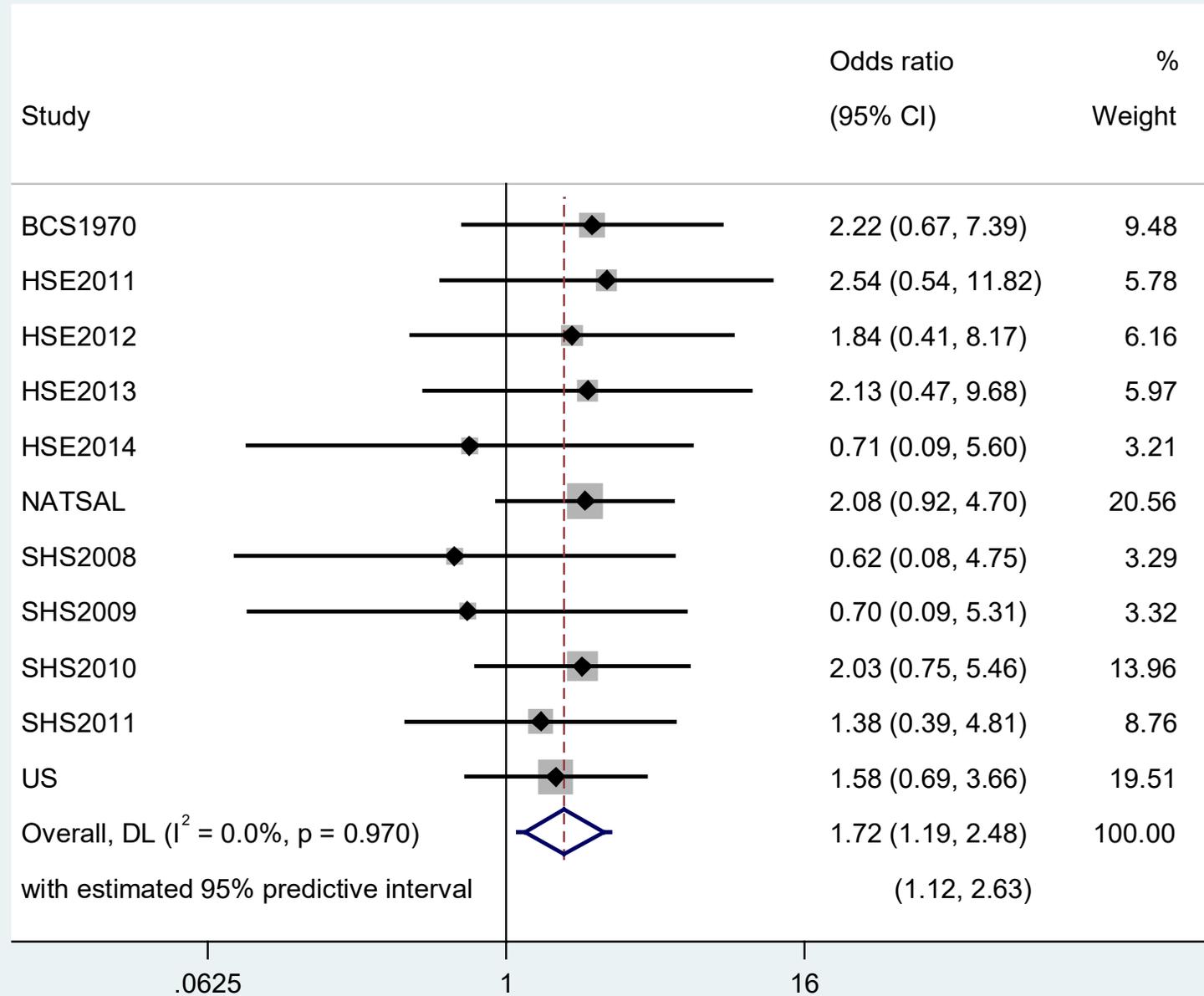
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# Bisexual - minimally adjusted



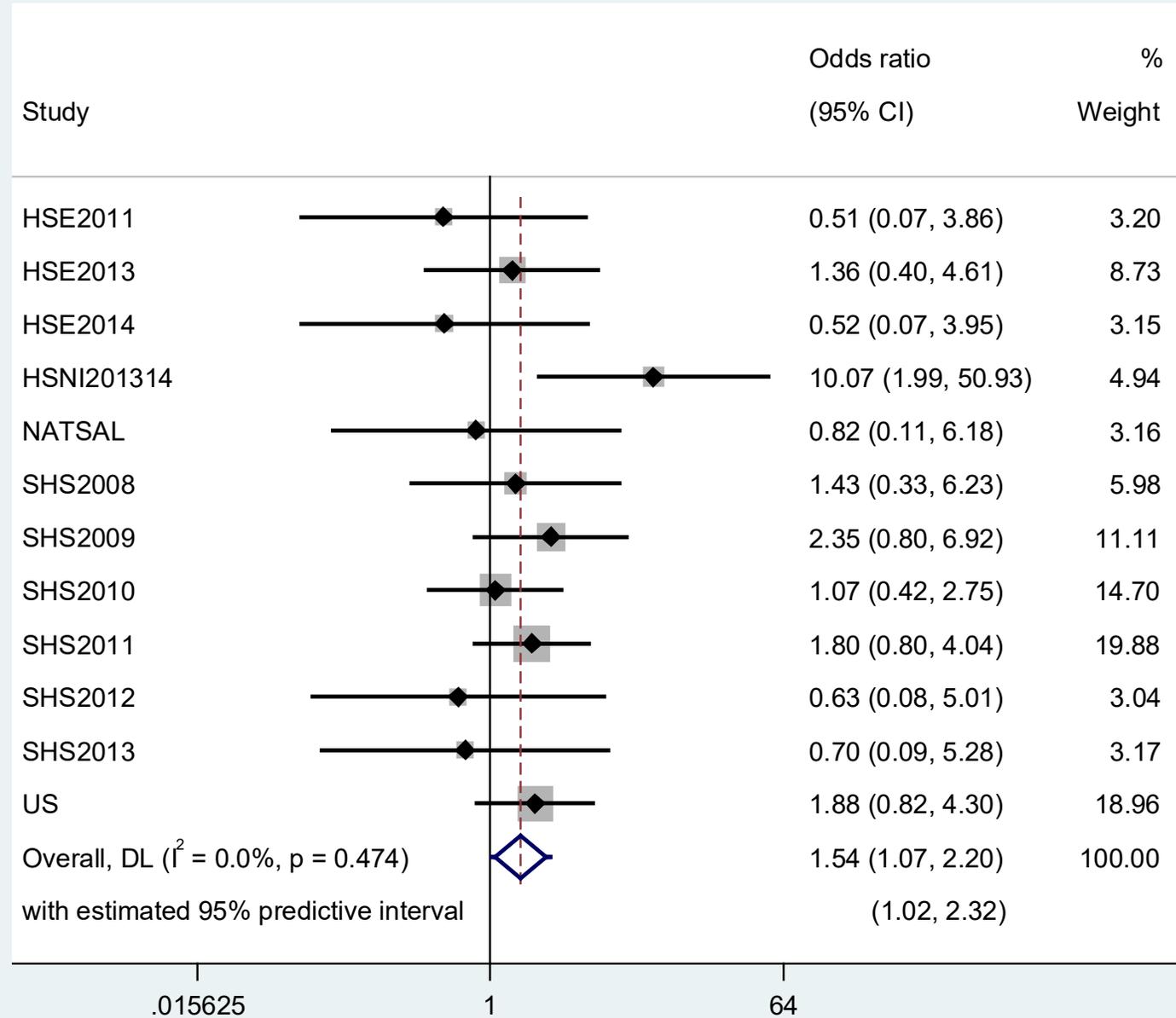
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# Bisexual - additionally adjusted



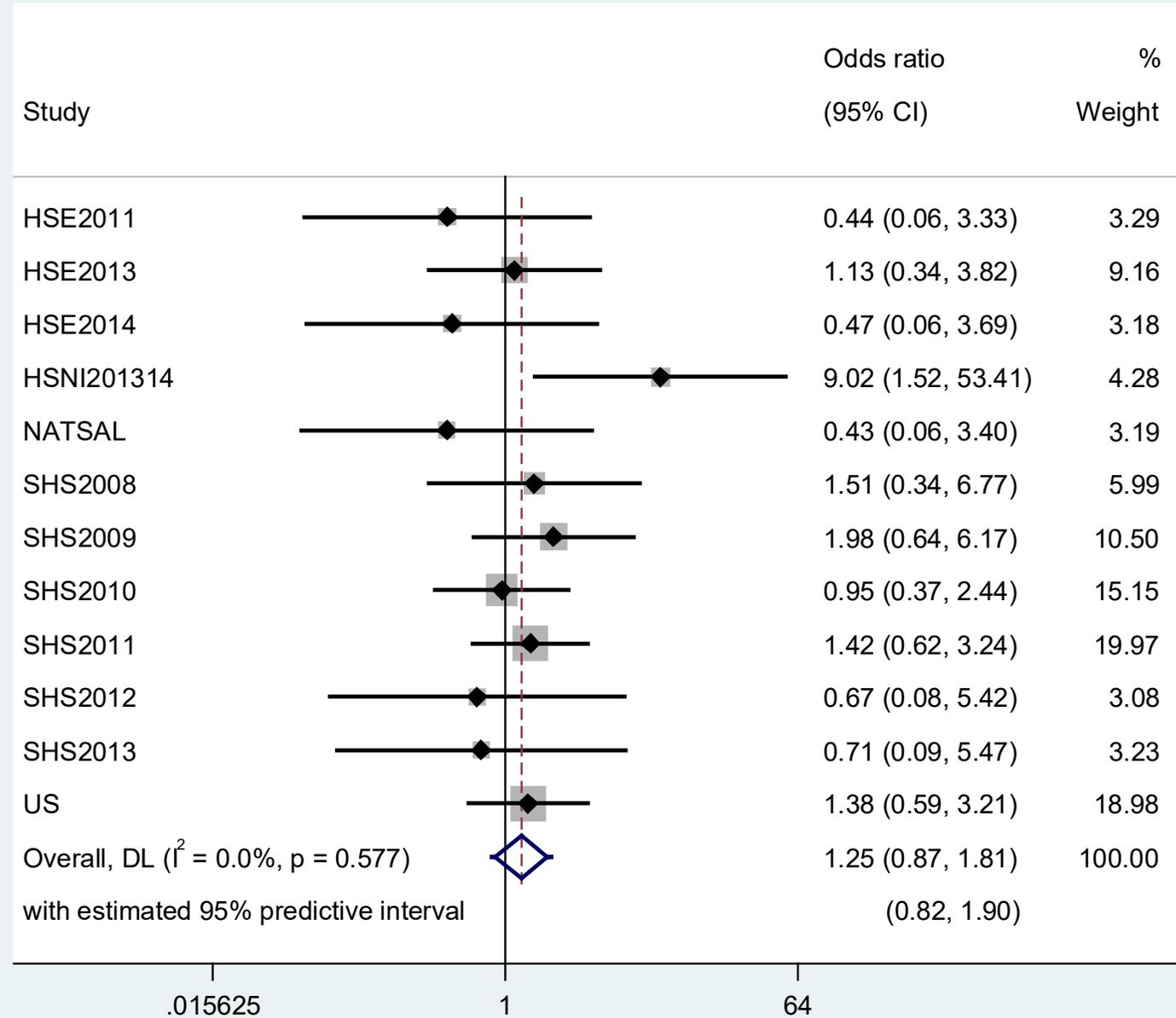
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# Other - minimally adjusted

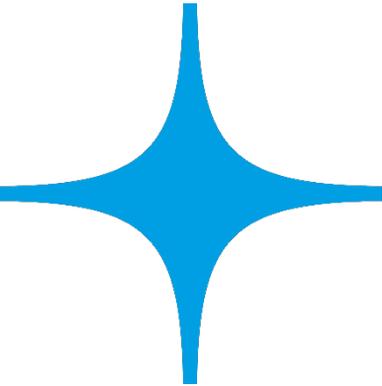


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# Other - additionally adjusted

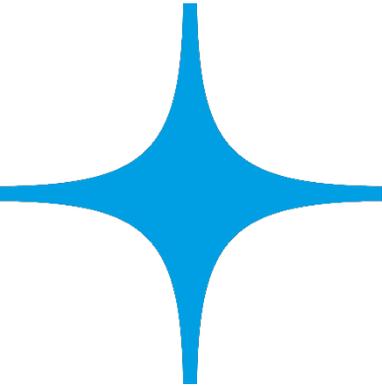


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## SUMMARY

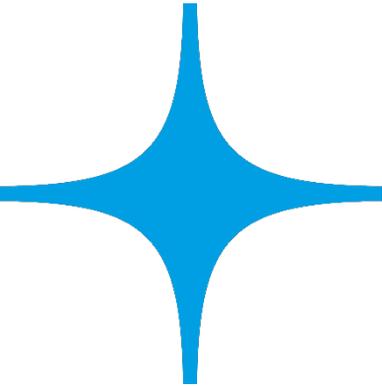
- All three groups - lesbian/gay, bisexual and “other” - showed increased risk of type II diabetes compared to heterosexuals in an analysis adjusted only for age and sex.
- Effect remained after adjustment for various factors for lesbian/gay and bisexual groups, suggesting the effect goes beyond these factors having a mediating role.



## STRENGTHS AND WEAKNESSES

- This is first study using UK health survey data to analyse risk of type II diabetes in UK sexual minority population.
- Because of the small numbers, some studies had no diabetes cases for some of the sexual orientation groups.

This meant that they couldn't be included in the analysis, biasing the estimates upwards.



## DISCUSSION

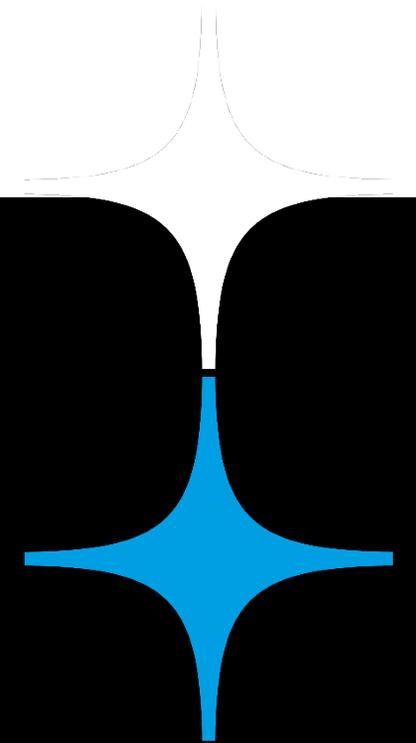
- Sexual orientation should continue to be included as standard in health surveys

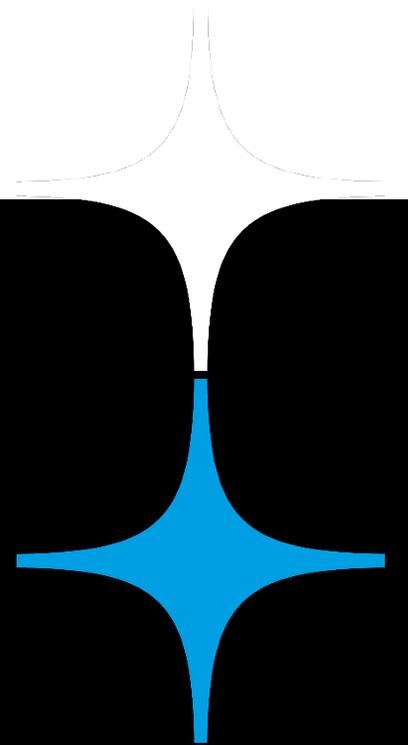
Boost sample to allow power for analysis (and disaggregation)

- Datasets be made available for analysis by researchers like us!
- Monitor sexual orientation as standard in all clinical settings to allow targeted health interventions to address ongoing disparities.

**THANK YOU**

**ANY QUESTIONS?**





<b>Study</b>	<b>Minimal vars</b>	<b>Alc &gt; limit</b>	<b>BMI</b>	<b>Eth Min</b>	<b>Five-a-day</b>	<b>Married/ cohab</b>	<b>Physical act</b>	<b>Degree</b>	<b>Smoker</b>	<b>Waist</b>
BCS1970	9,717	9,664	9,459	8,340	8,336	9,717	5,613	9,717	9,717	6,963
HSE2011	7,255	7,097	6,285	7,250	7,255	7,255	0	7,247	7,238	4,954
HSE2012	7,189	6,993	6,287	7,184	0	7,187	7,111	7,182	7,159	4,835
HSE2013	7,683	7,503	6,774	7,679	7,683	7,680	7,174	7,673	7,667	5,495
HSE2014	6,875	6,736	6,198	6,872	6,875	6,873	6,360	6,867	6,867	4,711
HSNI201011	3,936	2,933	2,463	0	3,931	3,936	3,922	3,289	3,936	0
HSNI201314	4,392	3,250	3,298	4,386	4,392	4,392	4,392	3,526	4,391	0
NATSAL	15,105	15,042	14,207	15,092	0	14,837	0	15,091	15,105	0
SHS2008	5,281	5,231	4,668	5,278	5,281	5,280	0	5,272	5,277	944
SHS2009	6,374	6,363	5,474	6,372	6,374	6,374	0	6,371	6,368	982
SHS2010	6,435	6,371	5,510	6,426	6,435	6,433	0	6,425	6,424	962
SHS2011	6,610	6,558	5,566	6,610	6,610	6,604	0	6,601	6,599	879
SHS2012	4,315	4,275	3,769	4,312	4,315	4,314	4,315	4,309	4,311	899
SHS2013	4,448	4,405	3,840	4,446	4,448	4,447	4,448	4,443	4,445	1,134
US	51,725	39,068	33,274	51,650	49,731	51,721	39,025	44,877	50,861	18,289
Total	147,340	131,489	117,072	141,897	121,666	147,050	82,360	138,890	146,365	51,047