1 4 9 5

UNIVERSITY OF ABERDEEN

Alcohol consumption in relation to risk (and severity) of reported chronic pain

Professor Gary J Macfarlane

Epidemiology 2015

5th August, Valencia

GLOBAL IMPACT OF MSK DISORDERS

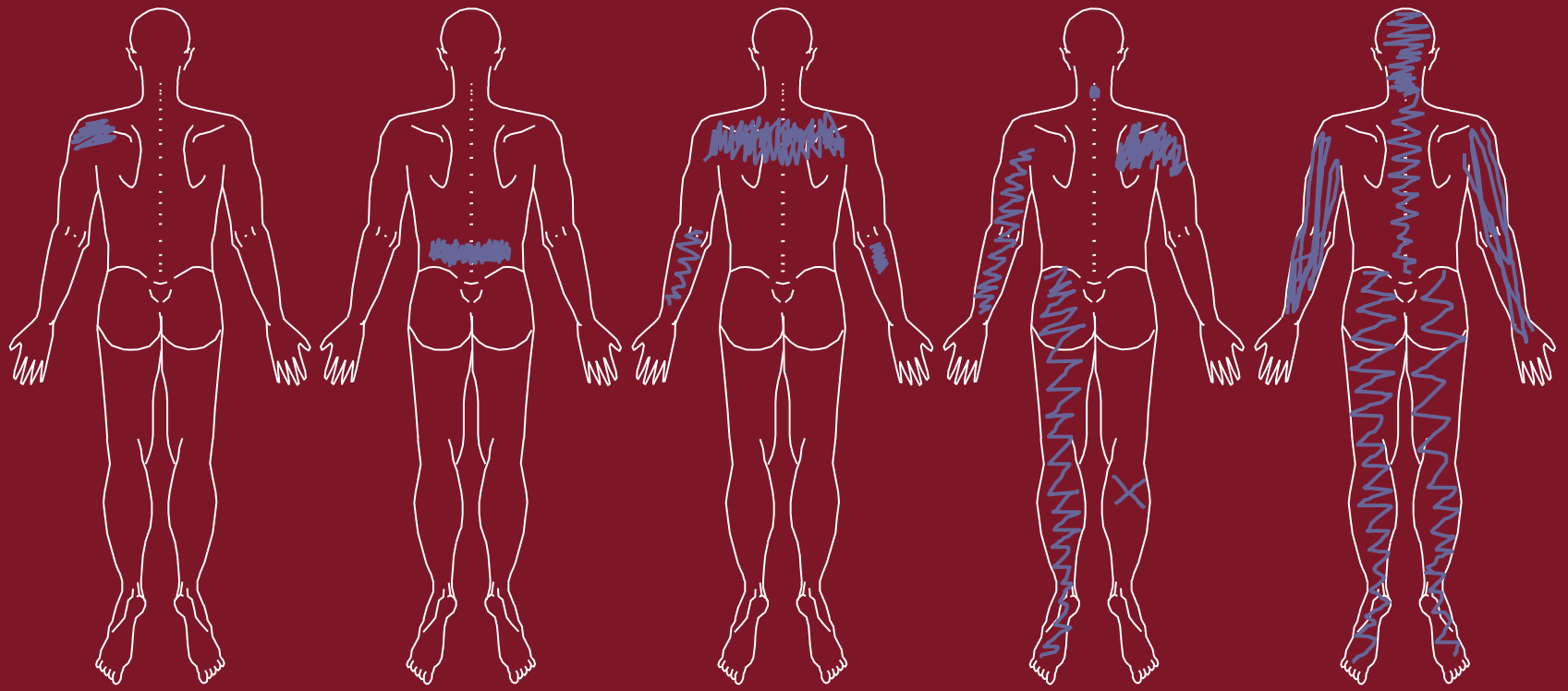
2nd leading cause of disability (YLDs)

4th leading cause of total burden (DALYs)



GBD 2010

Pain Continuum

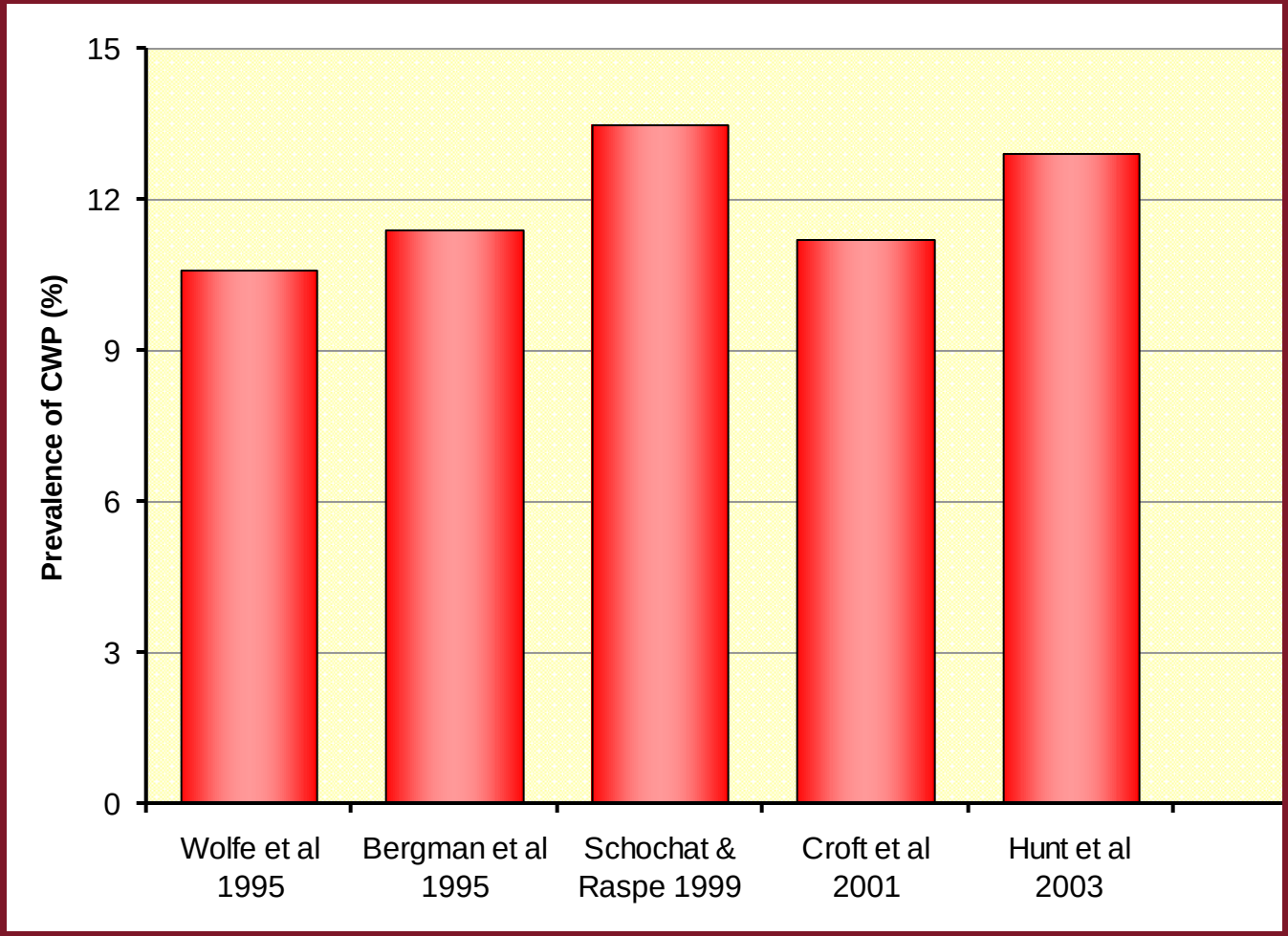


Regional pain ⟶ Widespread pain

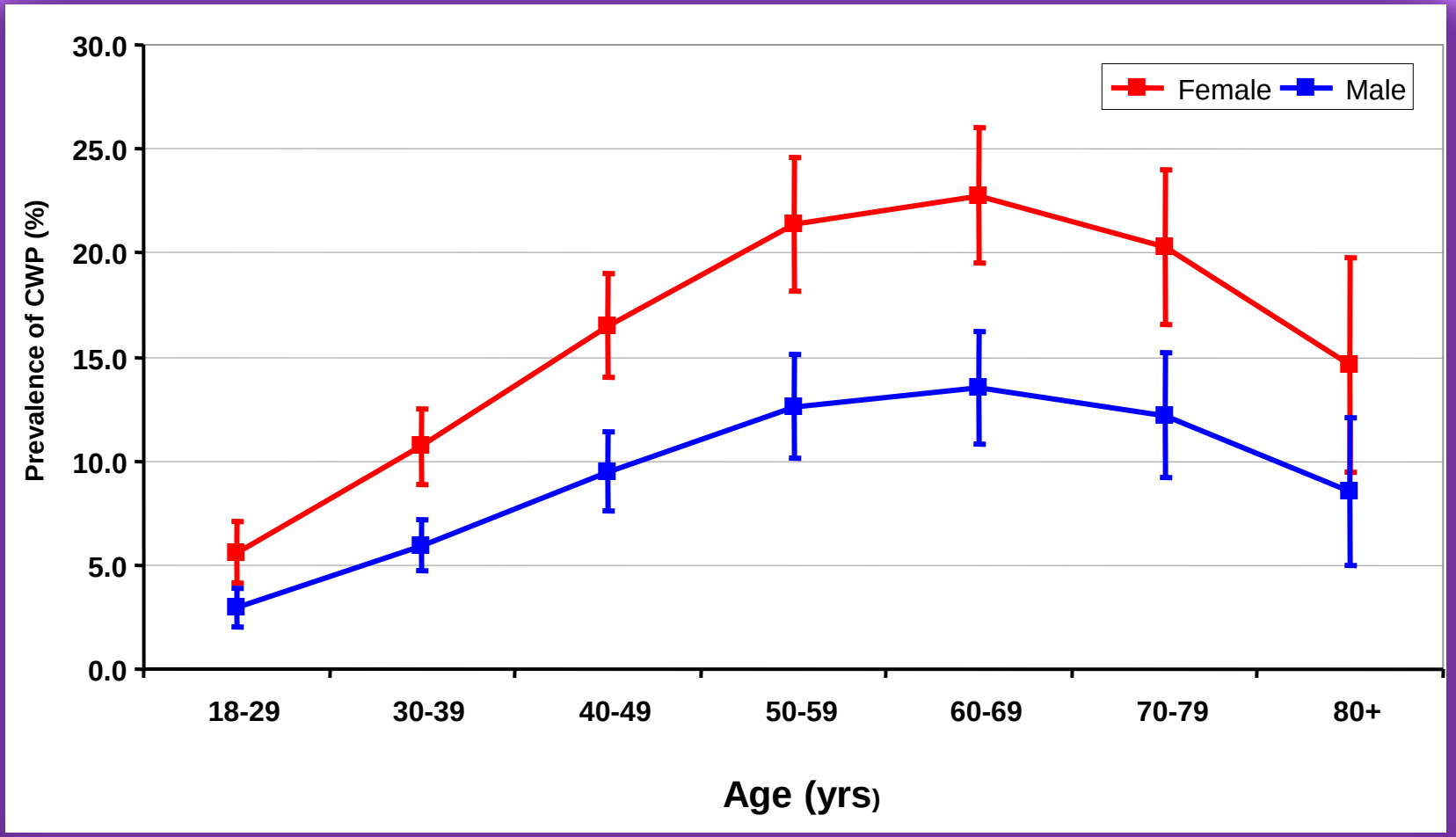
Chronic Widespread Pain

- CWP is the cardinal symptom of “fibromyalgia”
- Fibromyalgia is the second most common reason for referral to a rheumatologist
- Symptoms are long-lasting and associated with high levels of disability
- Persons with CWP have higher mortality rates from disease and non-disease causes of death

CWP prevalence



CWP prevalence by age and sex

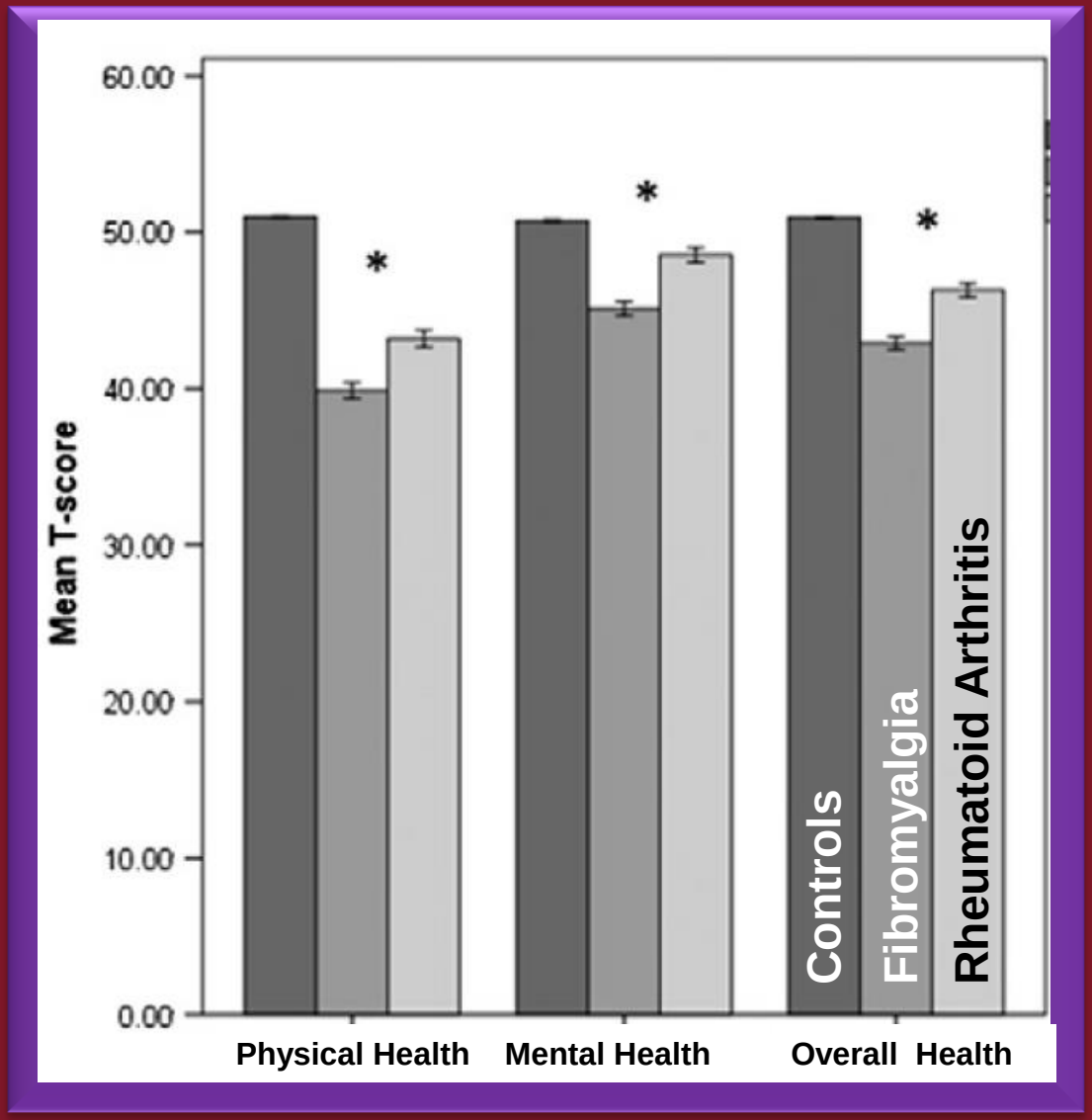


Wolfe et al, 1995

Chronic Widespread Pain

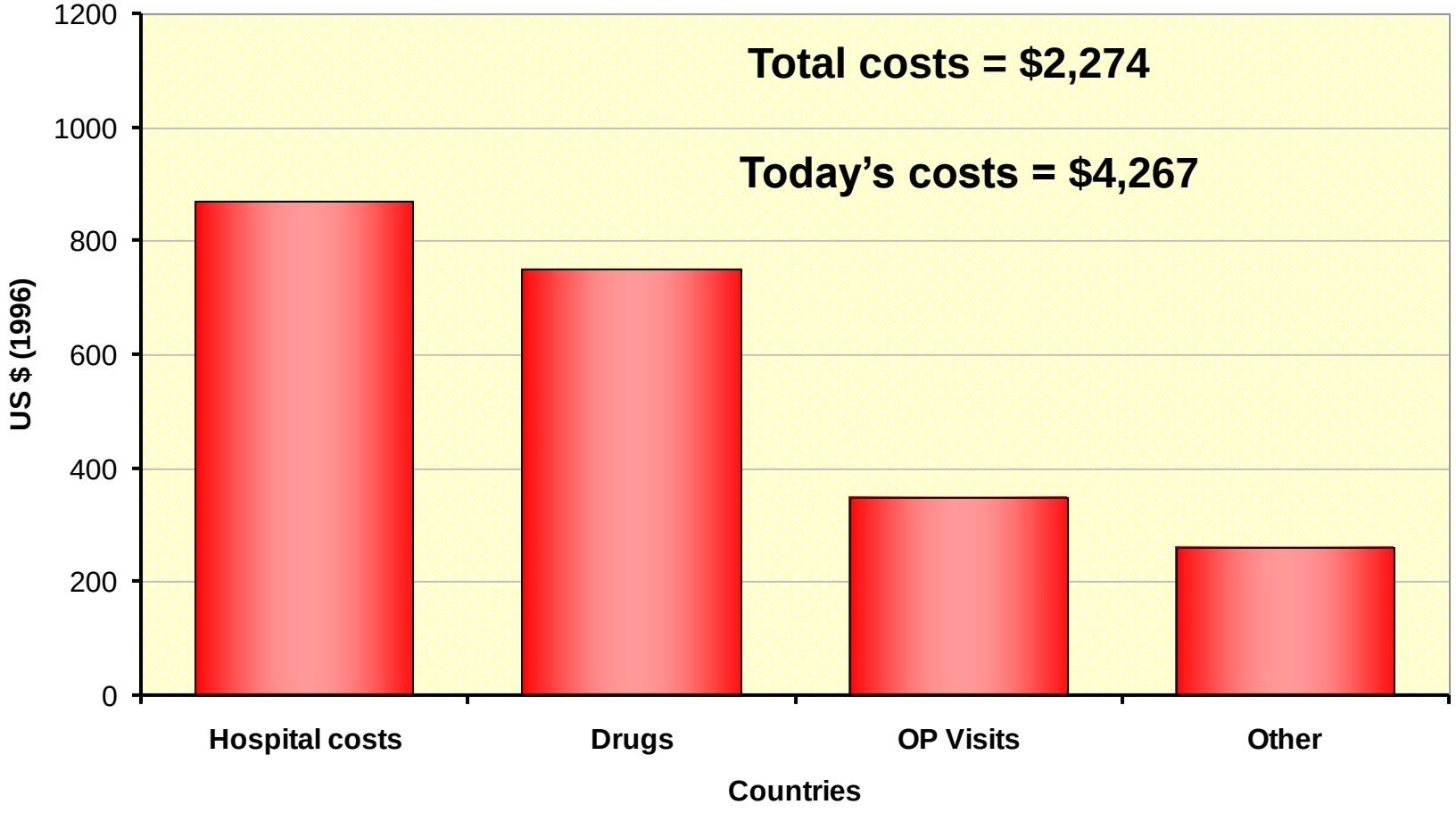
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Quality of Life in Fibromyalgia



Joustra et al, 2015

Direct medical costs amongst fibromyalgia patients



Wolfe et al, 1997

Chronic Widespread Pain

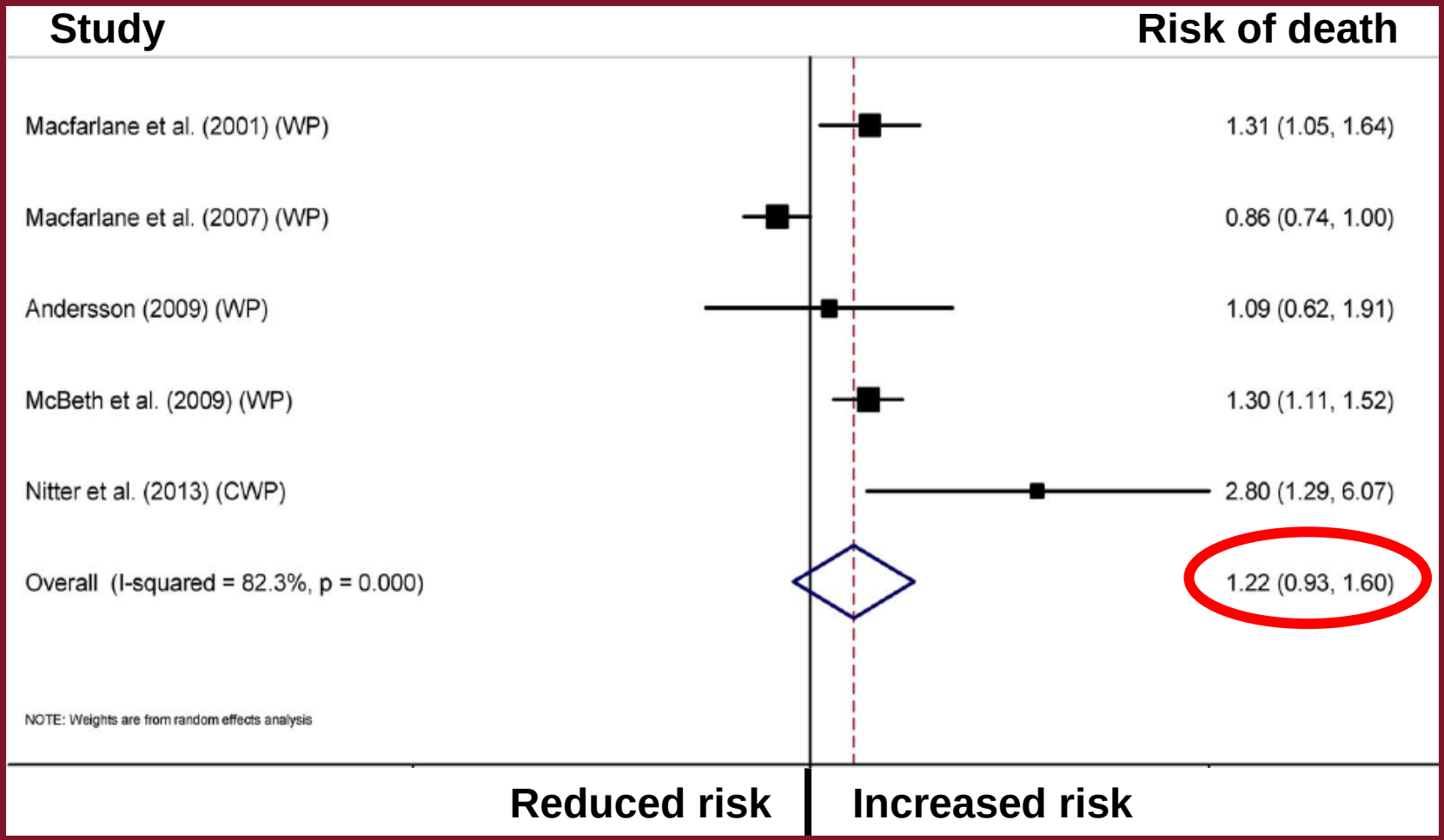
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OPEN ACCESS Freely available online

PLOS ONE

Chronic Pain and Mortality: A Systematic Review

Diane Smith[1]*, Ross Wilkie[1], Olalekan Uthman[2], Joanne L. Jordan[1], John McBeth[1]



BMC Musculoskeletal Disorders

BioMed Central

Research article

Open Access

An internet survey of 2,596 people with fibromyalgia

Robert M Bennett*[1], Jessie Jones[2], Dennis C Turk[3], I Jon Russell[4] and Lynne Matallana[5]

BMC Musculoskeletal Disorders 2007, **8**:27

Event	Frequency
Chronic stress	41.9%
Emotional trauma	31.3%
Acute illness	26.7%
Physical injury (non-MVA)	17.1%
Surgery	16.1%
Motor vehicle accident (MVA)	16.1%
Emotional and physical abuse as an adult	12.2%
Emotional and physical abuse as a child	11.9%
Thyroid problems	10.3%
Menopause	10.1%
Sexual abuse as a child	8.7%

Background

- The aetiology of chronic widespread pain (CWP) is complex
- Population and clinical studies have provided insights into
  - characteristics of persons who report CWP
  - biological mechanisms which may underpin these

Background

- Cohort studies have specifically allowed us to identify predictors of onset (rather than just associated factors)

Rheumatology 2007;46:666–671
Advance Access publication 4 November 2006
doi:10.1093/rheumatology/kel363

The role of psychosocial factors in predicting the onset of chronic widespread pain: results from a prospective population-based study

A. Gupta, A. J. Silman, D. Ray[1], R. Morriss[2], C. Dickens[3], G. J. MacFarlane[4], Y. H. Chiu, B. Nicholl and J. McBeth

Background

- Establishing the role of lifest
  aetiology is challenging



arthritis research&therapy

RESEARCH ARTICLE Open Access

Association between alcohol consumption and symptom severity and quality of life in patients with fibromyalgia

Chul H Kim[1,2], Ann Vincent[3], Daniel J Clauw[4], Connie A Luedtke[5], Jeffrey M Thompson[1], Terry D Schneekloth[6] and Terry H Oh[1*]

EDITORIAL

Can alcohol consumption be an alternative treatment for fibromyalgia?

Mei Chung[1] and Chenchen Wang[2*]

Objectives

- To determine whether:
  - we could confirm that, amongst persons with CWP, moderate alcohol consumption was associated with lower disability
  - level of alcohol consumption was associated with likelihood of reporting CWP
  - any observed associations are likely to be causal

Methods 1

- MUSICIAN study: a 2 x 2 factorial RCT testing cognitive behaviour therapy and exercise in the management of CWP
- Identification of eligible subjects was by population survey of ~46000 adults resident in two areas of the United Kingdom
- Self-completed questionnaire returned by post

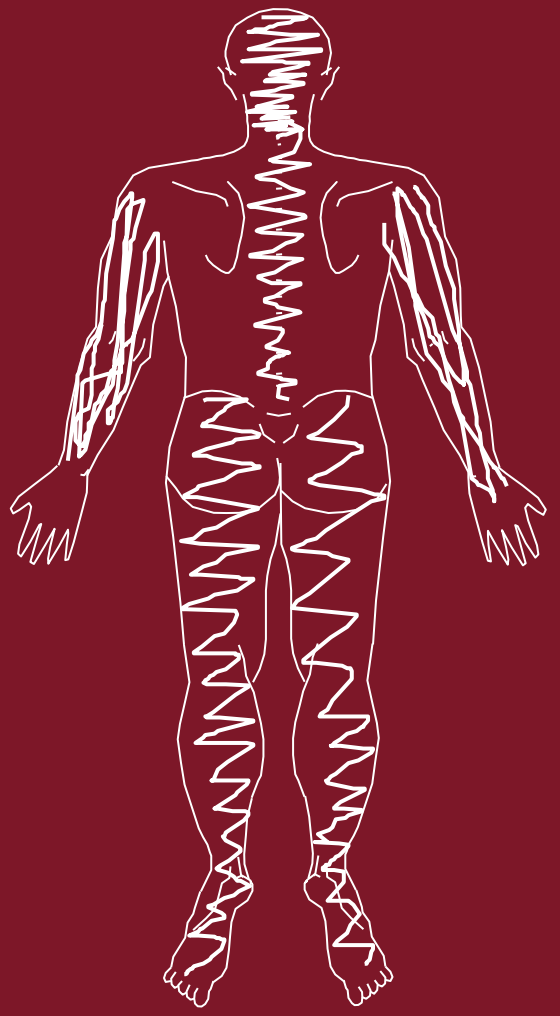
McBeth et al, Arch Int Med, 2012

Methods 1

Have you experienced pain lasting at least one day during the past month?

If yes,

Indicate the site of the pain on the manikin



Methods 1

Have you ever drunk alcohol regularly (at least once per week) for a period of one month or longer?

How many units of alcohol do you drink, on average, per week?

***Note: One unit of alcohol is: ½ pint average strength beer/lager OR one small glass of wine OR one single measure of spirits*.**

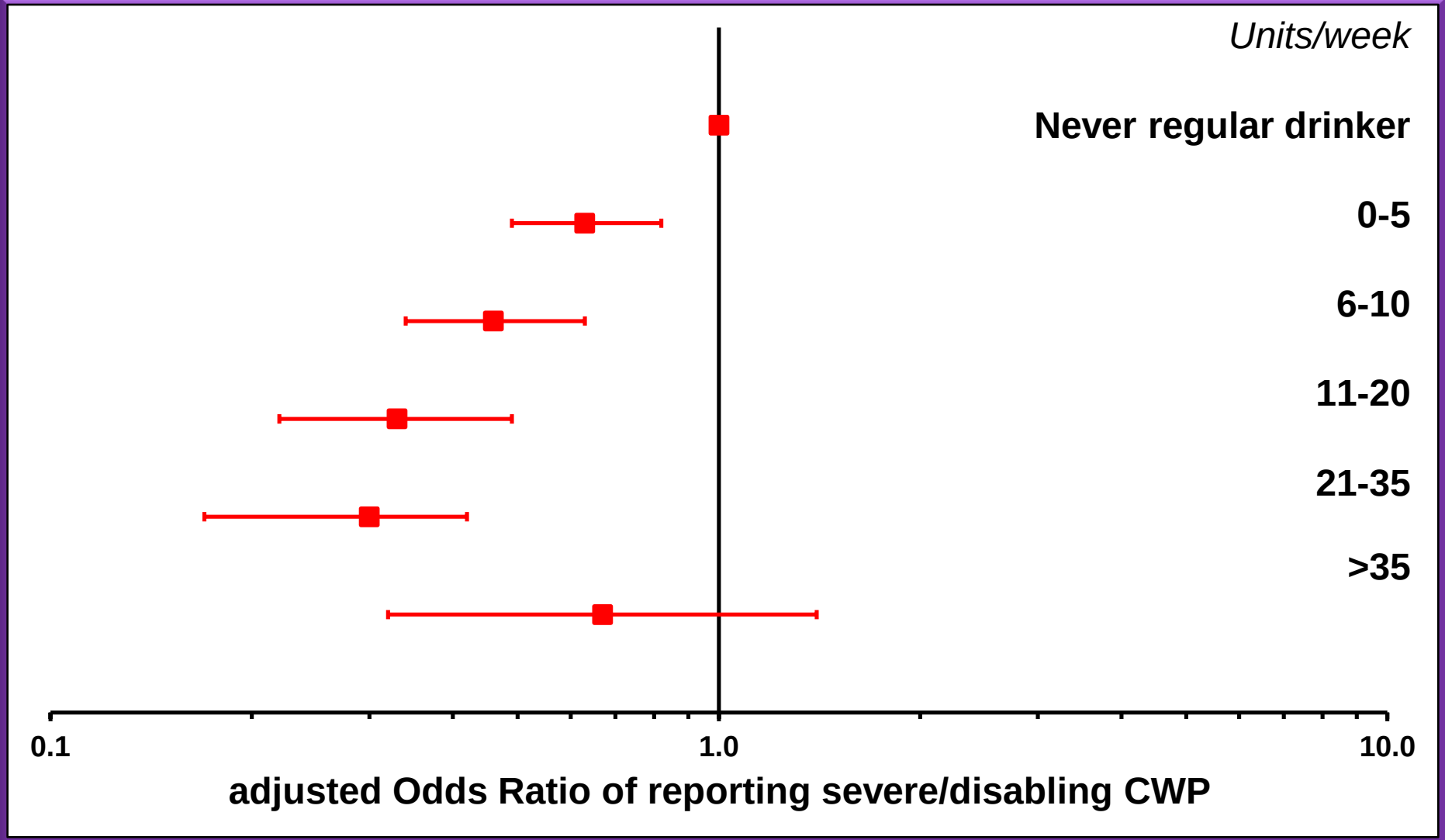
Characteristics of respondents

Total Respondents	13587
Mean age (years)	55
Female (%)	57
CWP (%)	16.5
Usual alcohol consumption (units/week)	(%)
• Never regular drinker	28
• 0 – 5	29
• 6 – 10	20
• 11 – 20	15
• 21 – 35	7
• > 35 units	2

CWP severity and level of alcohol consumption

	CWP			
Units/week	**Mild**		**Moderate/Severe**	
Never regular drinker	353	53%	314	47%
0 – 5	396	67%	194	33%
6 – 10	283	76%	92	25%
11 – 20	216	82%	47	18%
21 – 35	96	81%	22	19%
> 35	23	49%	24	51%

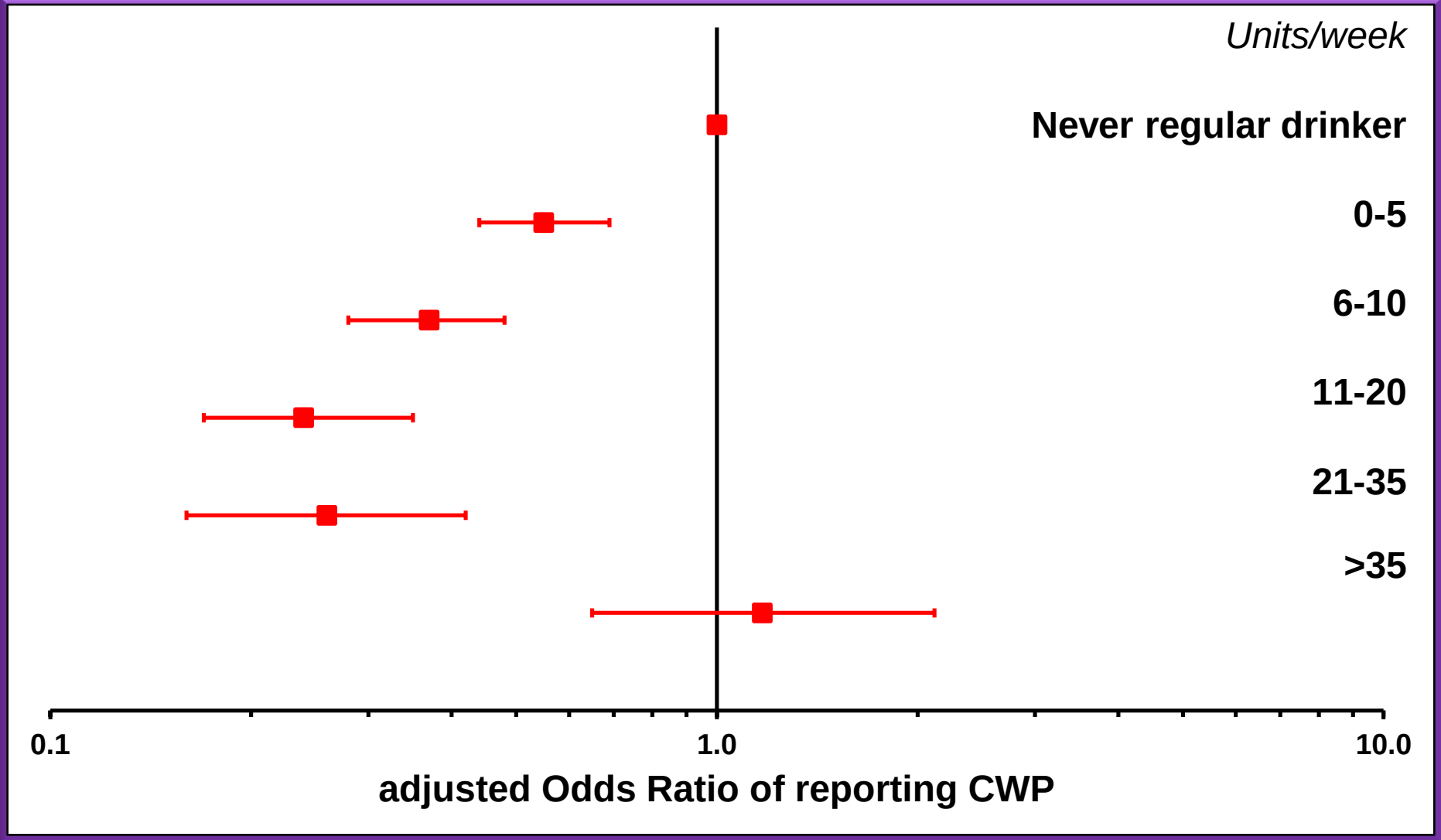
CWP severity and level of alcohol consumption



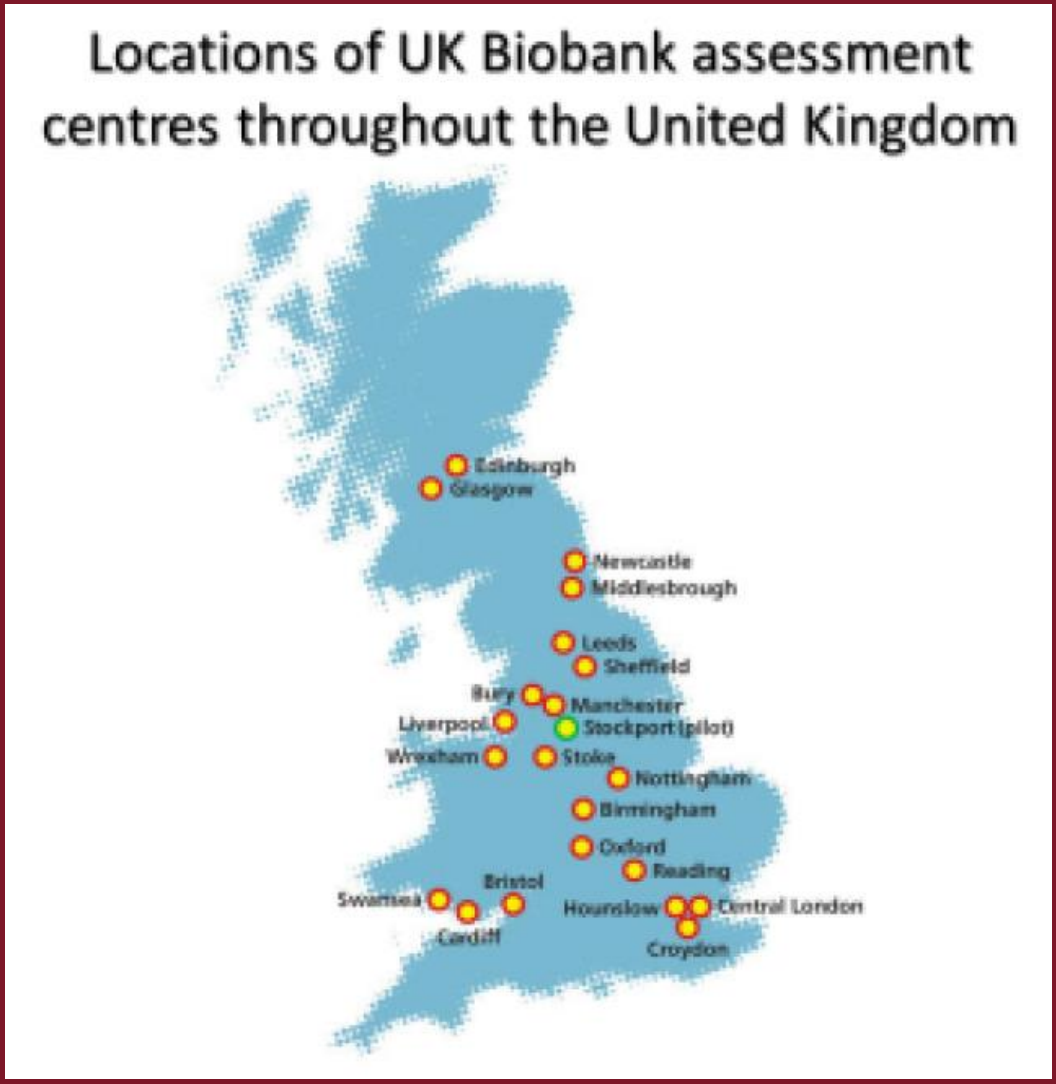
CWP prevalence and level of alcohol consumption

	Chronic Widespread Pain			
Units/week	No		Yes	
Never regular drinker	3040	80%	753	20%
0 - 5	3231	84%	635	16%
6 - 10	2248	85%	406	15%
11 - 20	1812	87%	274	13%
21 - 35	808	87%	122	13%
> 35	206	80%	52	20%

CWP prevalence and level of alcohol consumption



Methods 2



- A national population study of 503,325 persons.
- Recruited through 22 centres in Great Britain between 2006-10
- Participants completed questionnaires on health, lifestyle and environment and provided biological samples

Methods 2

In the last month have you experienced any of the following which interfered with your usual activities?

- Participants were than provided with a list of seven regional pains (e.g. back pain) and “pain all over the body
- For each they were asked if the pain had been present for at least 3 months,

Methods 2

- **Alcohol questions related to:**
  - ***Amount***
  - ***Frequency***
  - ***Previous consumption if non-drinkers***
  - ***Changes in consumption in past 10 years***
  - ***Reasons for stopping or reducing consumption***

Methods 2

- **Participants classified as:**
  - **Changed alcohol consumption**
  - **No reported change in alcohol consumption**
    - **Non-drinkers**
    - **Special occasions only**
    - **1-3 times/month**
    - **Units/week if weekly consumption**

Methods 2

- Adjustment was made for:
  - Age, Gender
  - BMI
  - Education, Deprivation
  - Social Networks/Loneliness
  - Mood
  - Smoking

Alcohol consumption and “pain all over”

	Total (n)	Chronic “pain all over” (%)	Adjusted OR	99% CI
Always non-drinkers	18906	3.17%	1.00	
Special occasions only	20480	1.87%	0.58	0.49,0.69
1-3 times/month	19730	1.10%	0.34	0.28,0.42
1-5 units/week	16557	0.65%	0.20	0.15,0.26
6-10 units/week	37598	0.66%	0.20	0.17,0.25
11-15 units/week	33779	0.58%	0.18	0.14,0.22
16-20 units/week	24852	0.71%	0.22	0.17,0.27
>20 units per week	74507	0.66%	0.20	0.17,0.24

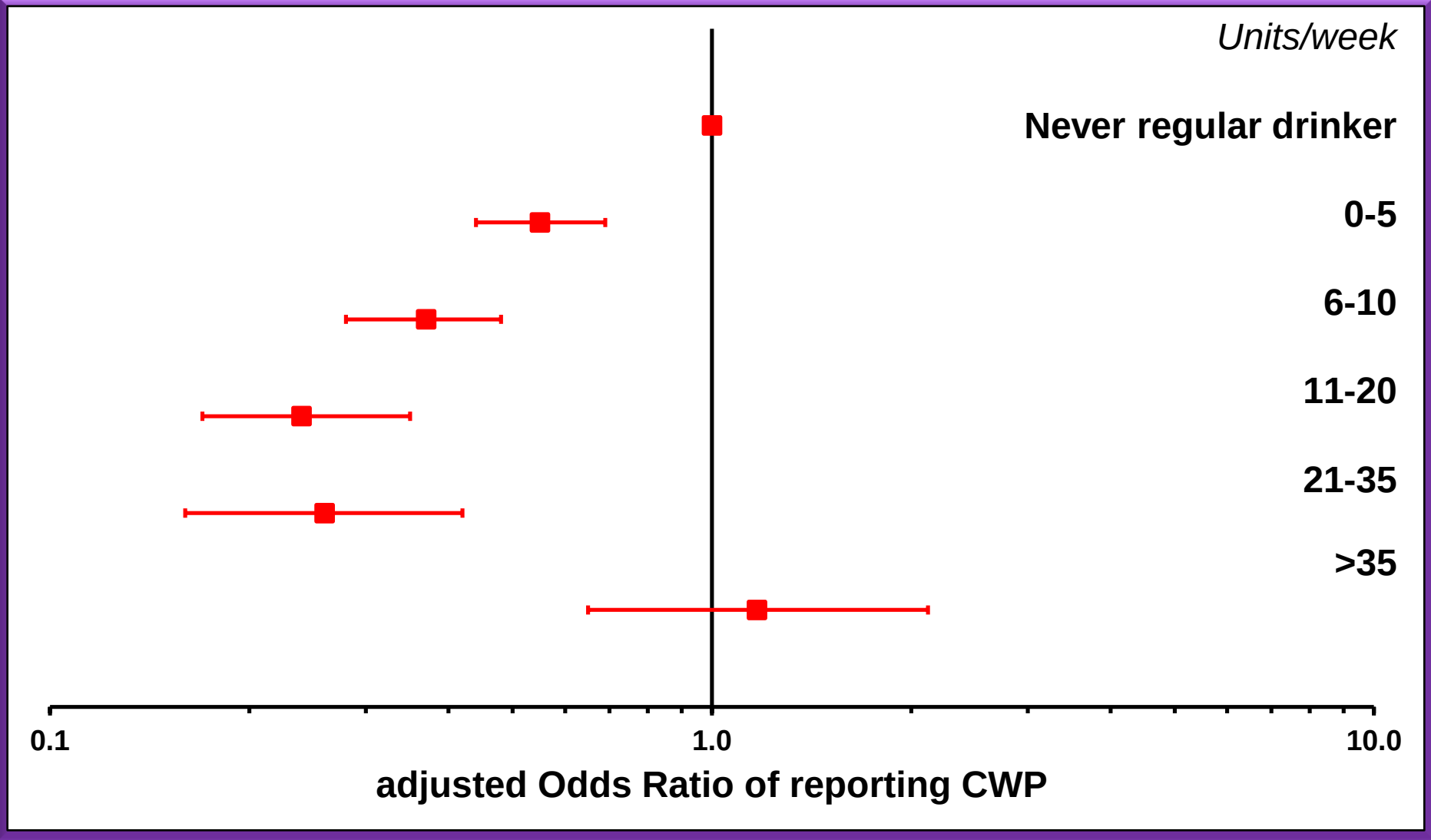
Discussion

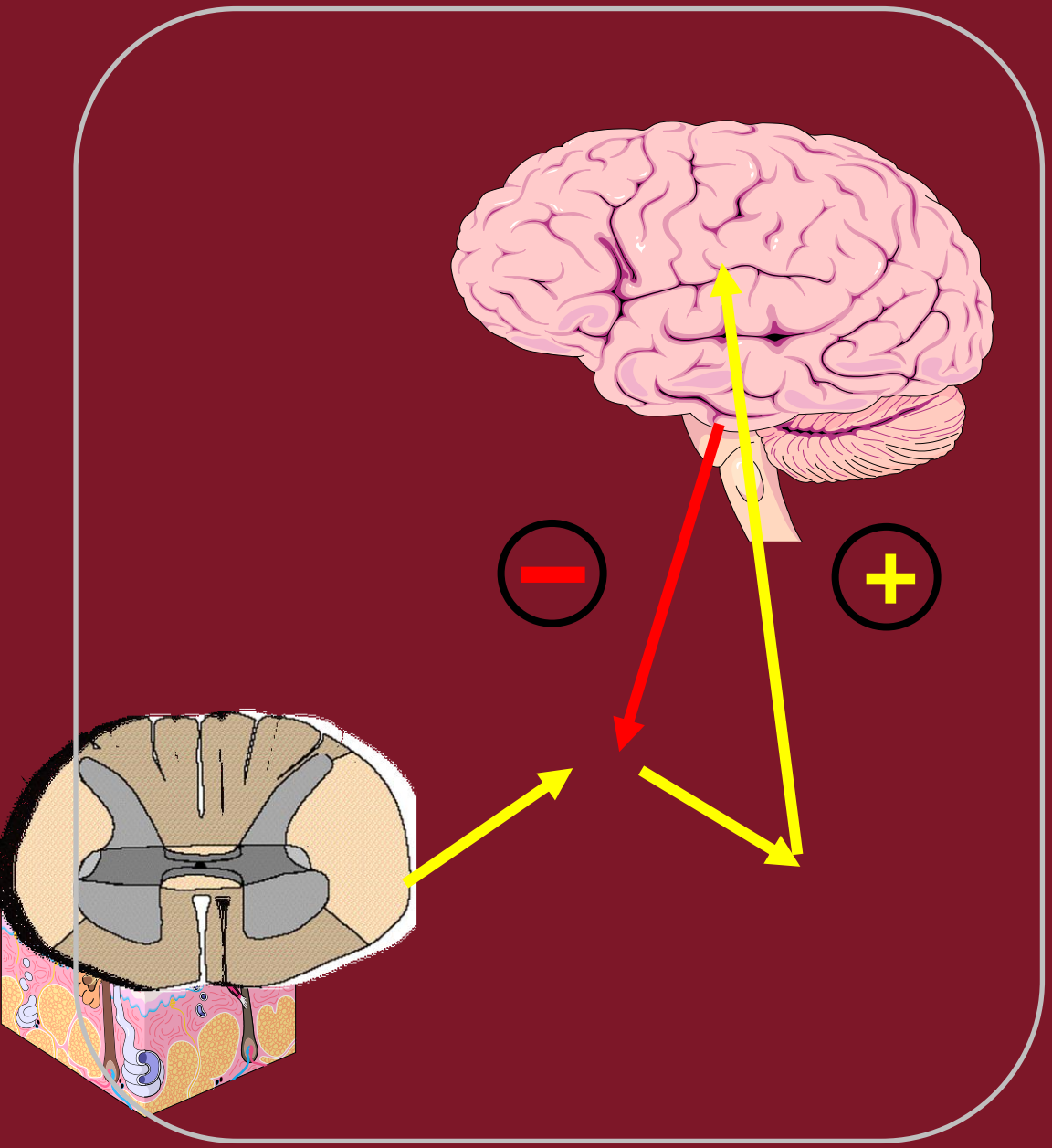
- We have demonstrated strong relationships between moderate-high alcohol consumption and:
  - lower risk of reporting CWP
  - amongst persons with CWP, lower risk of severe and disabling symptoms
- The strong associations have now been observed across 3 separate studies
- Associations do not necessarily imply causality

Bias and Confounding

- Bias
  - reporting of alcohol intake
- Confounding
  - major issue for epidemiological studies assessing lifestyle factors
  - level of alcohol consumption (generally) related to other lifestyle factors (e.g. exercise) and individual characteristics (e.g. depression) known to be markers of CWP onset

Causal relationship or association





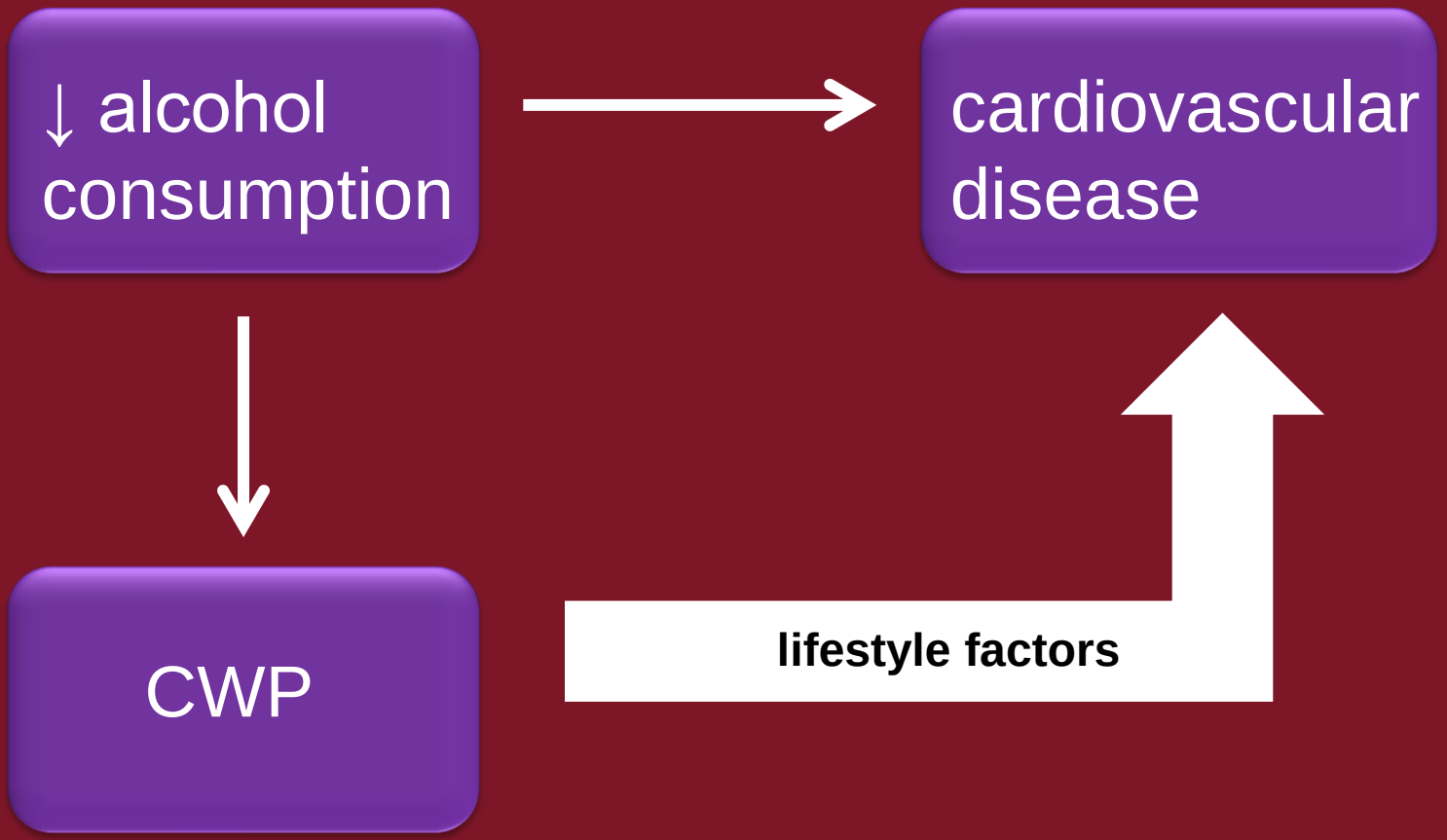
- Pain inhibition via descending anti-nociceptive pathways
- One of the neurotransmitters identified is γ- aminyl butyric acid (GABA), the release of which is enhanced by ethanol
- Patients with fibromyalgia may have low levels of GABA

Causal relationship or association

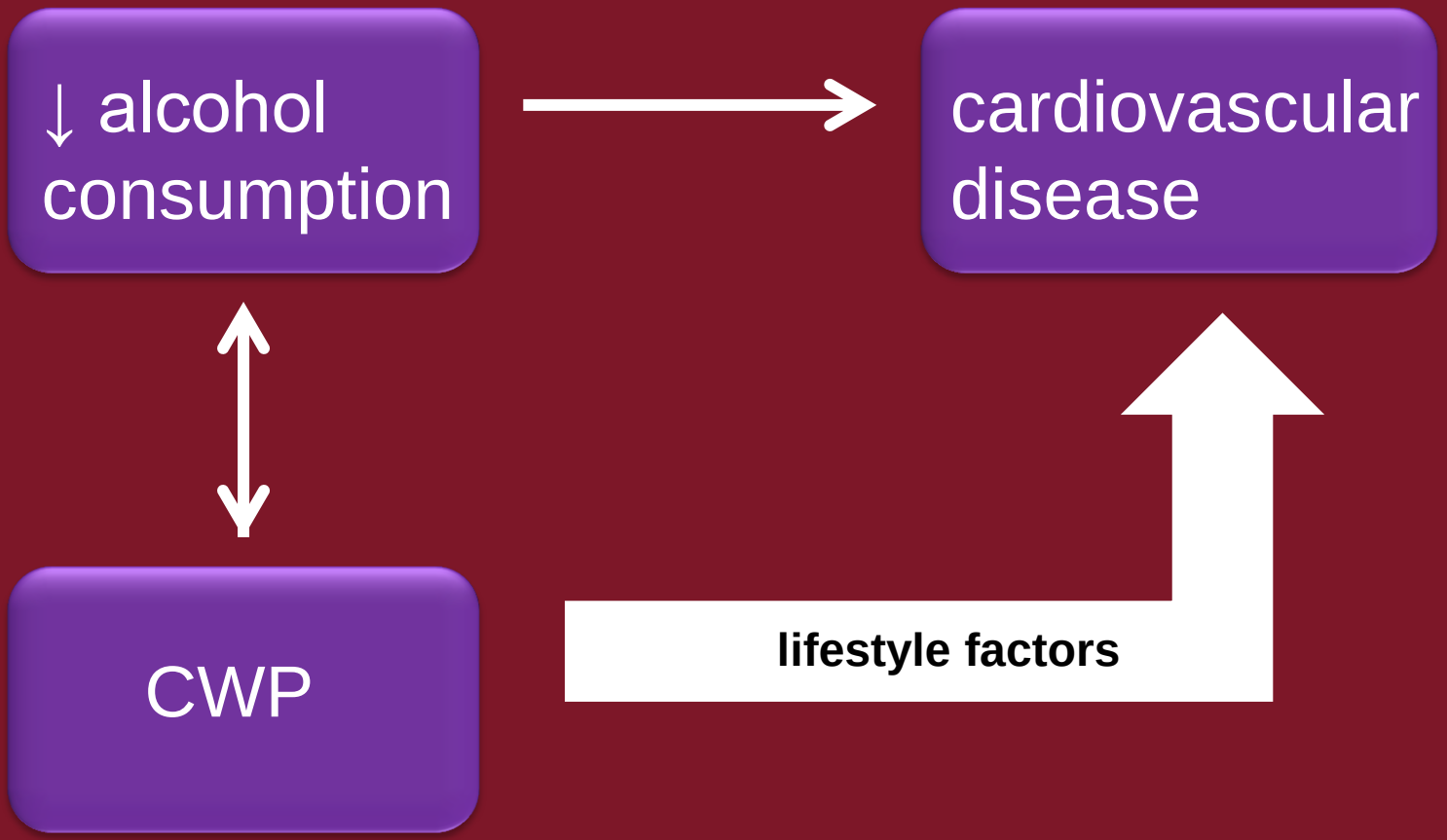
- strength of association
- dose risk relationship
- biological plausibility

- specificity
- temporality
- coherence of evidence

Specificity



Temporality



Causal relationship or association

- strength of association
- dose risk relationship
- biological plausibility

- specificity
- temporality
- coherence of evidence

Discussion

- Reasonable confidence that there is a relationship between alcohol conumption and CWP (disability)
- We cannot conclude that the association between moderate-high alcohol consumption and CWP is causal
- The size of the association means it warrants further investigation
- Most likely to have relevance with respect to understanding mechanisms of disease

Acknowledgement

- Co-author: Marcus Beasley
- This study used biobank uk resource
- MUSICIAN study team

Arthritis Research UK

Relative Risk Reduction of CWP by level of alcohol consumption

Amongst persons with long-term stable alcohol consumption

