

# Counting the Cost of Adverse Childhood Experiences

Measuring their impact on long-term health and the wider economy

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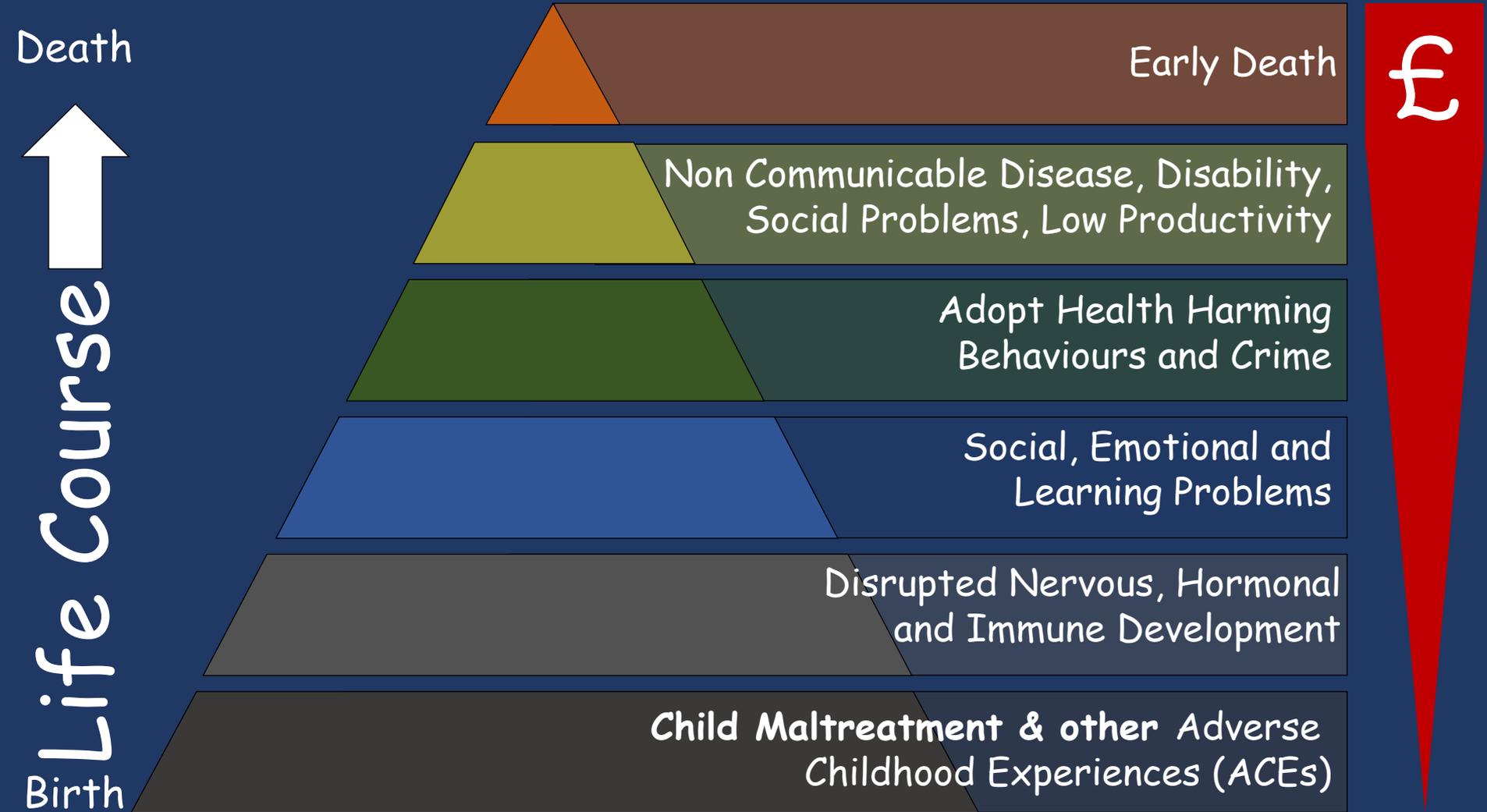
# How many people have suffered ACEs?

USA	Wales	England	ACEs measured	Euro
18%	16%	15%	Physical abuse	18%
12%	7%	6%	Sexual abuse	6%
34%	17%	18%	Emotional abuse	10%

**Eastern Europe** 49% suffered at least one ACE, 6% 4+ ACEs  
**England** 48% suffered at least one ACE, 9% 4+ ACEs  
**Wales** 50% suffered at least one ACE, 14% 4+ ACEs  
**USA** 62% suffered at least one ACE, 16% 4+ ACEs

17%	18%	12%	Mental illness	11%
28%	13%	10%	Alcohol problem	16%
8%	6%	4%	Drug user	3%
	4%	4%	Incarcerated	5%

# Child Maltreatment and other Adverse Childhood Experiences ACEs - The Life Course



# Collaborative Global ACE Analysis with WHO

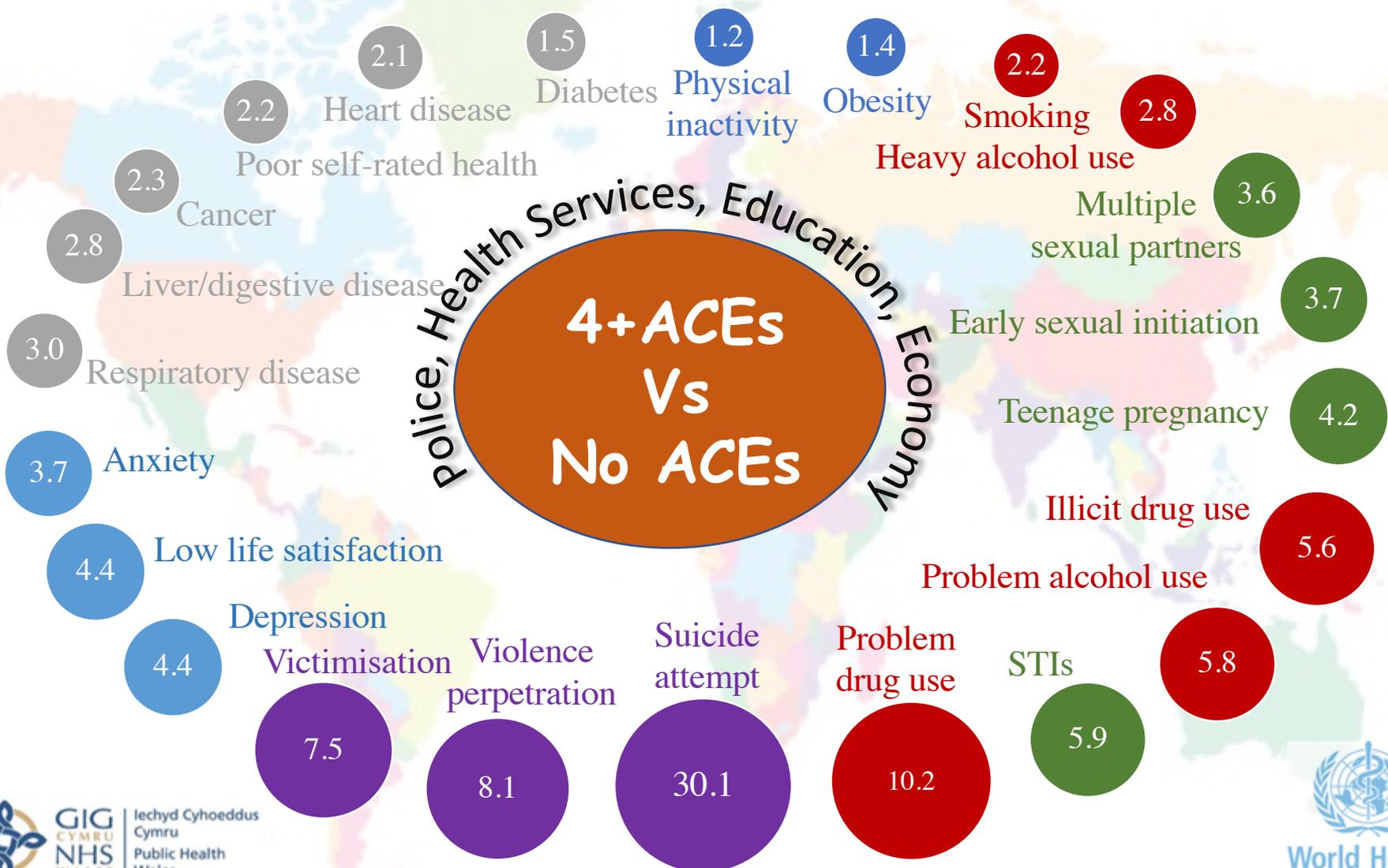
PHYSICAL HEALTH

WEIGHT & EXERCISE

SEXUAL HEALTH

Police, Health Services, Education, Economy

**4+ ACEs**  
Vs  
**No ACEs**



Hughes, Bellis, Hardcastle et al, 2017 Lancet Public Health

MENTAL HEALTH

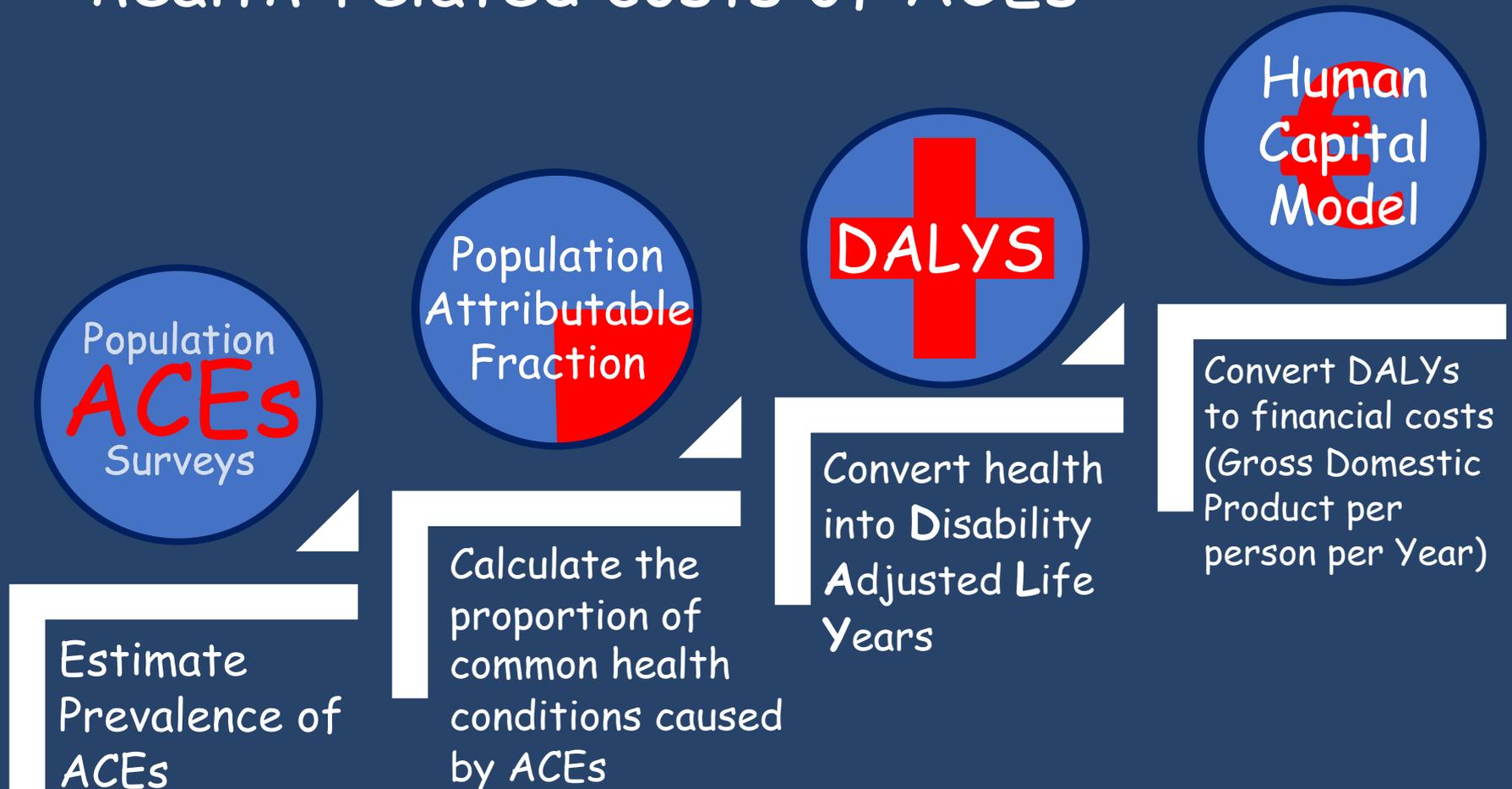
VIOLENCE

SUBSTANCE USE

# Objectives

- Aim

- Create a life course measure of the main health-related costs of ACEs



# Study Selection

**9,156** references retrieved in searches



4,387 unique references subjected to title/abstract review



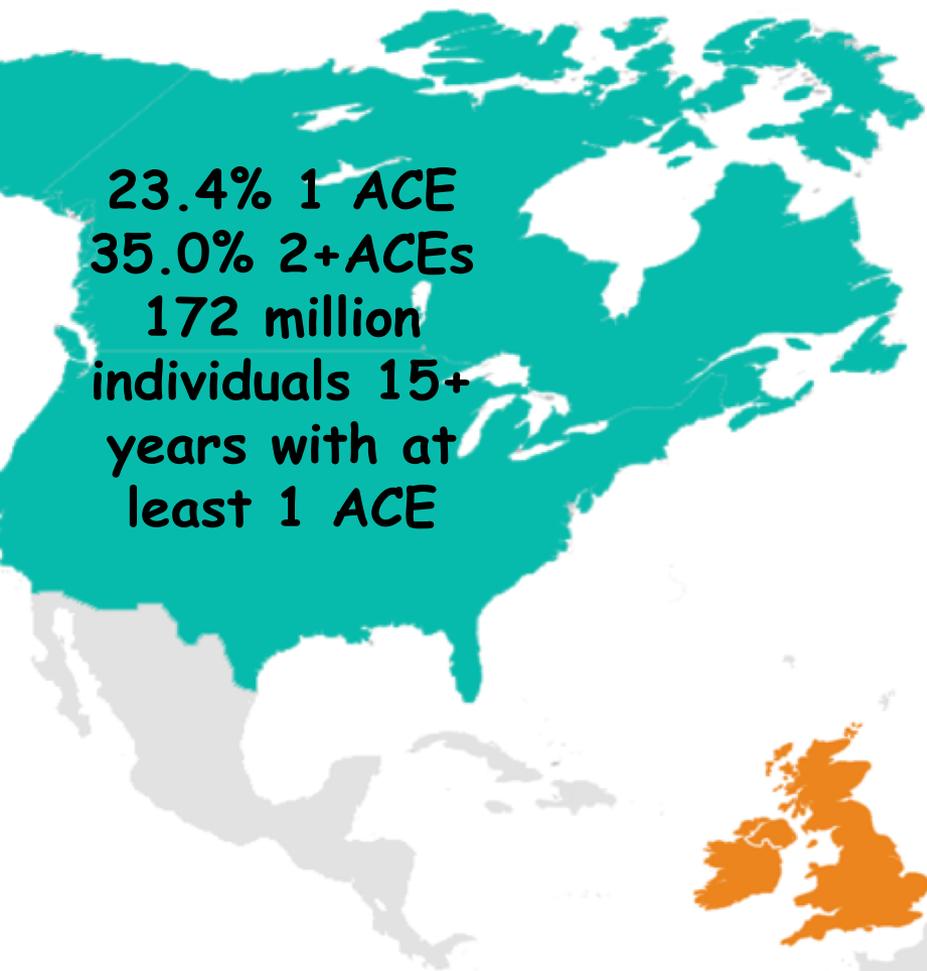
Full text obtained for 880 articles



221 articles considered for inclusion

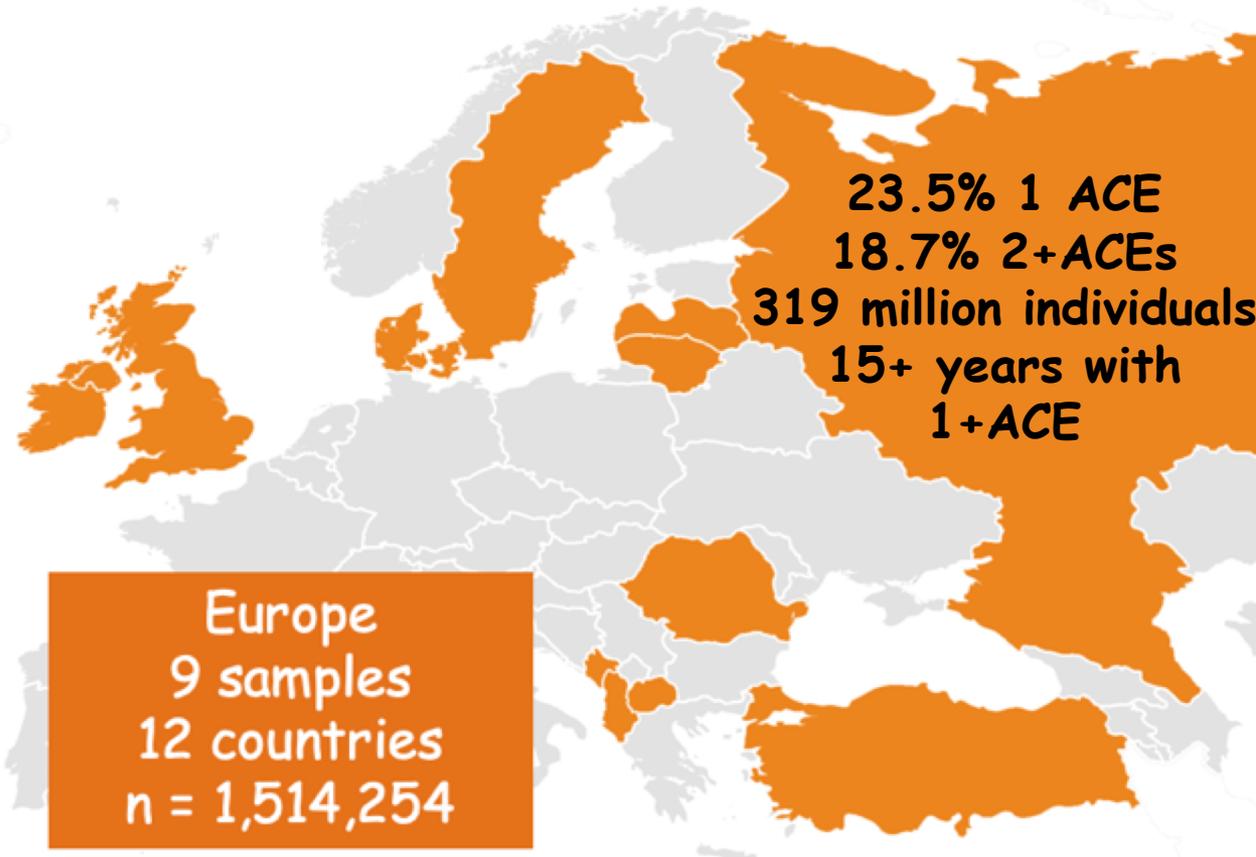
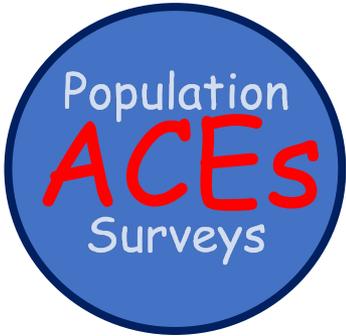


**23** articles using unique samples on health topics included in Euro and NA



**23.4% 1 ACE**  
**35.0% 2+ACEs**  
**172 million**  
**individuals 15+**  
**years with at**  
**least 1 ACE**

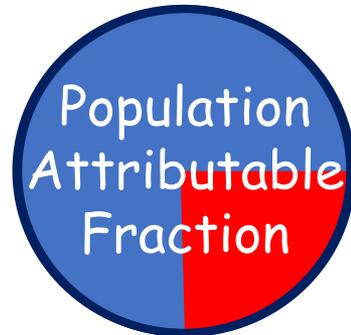
**North America**  
**10 samples**  
**USA & Canada**  
**n = 121,341**



**23.5% 1 ACE**  
**18.7% 2+ACEs**  
**319 million individuals**  
**15+ years with**  
**1+ACE**

**Europe**  
**9 samples**  
**12 countries**  
**n = 1,514,254**

# Increased risk of ill health outcomes by ACE Count



## • Risk Factors

- Harmful Alcohol Use
- Illicit Drug Use
- Smoking
- Obesity

## • Causes of Ill health

- Anxiety
- Depression
- Cancer
- Cardiovascular Disease
- Diabetes
- Respiratory Disease

• Risks consistently higher as ACE counts increases

• Similar increases between continents

• Smoking	Euro	NA
• 1 ACE	29%↑	23%↑
• 2+ ACEs	82%↑	74%↑

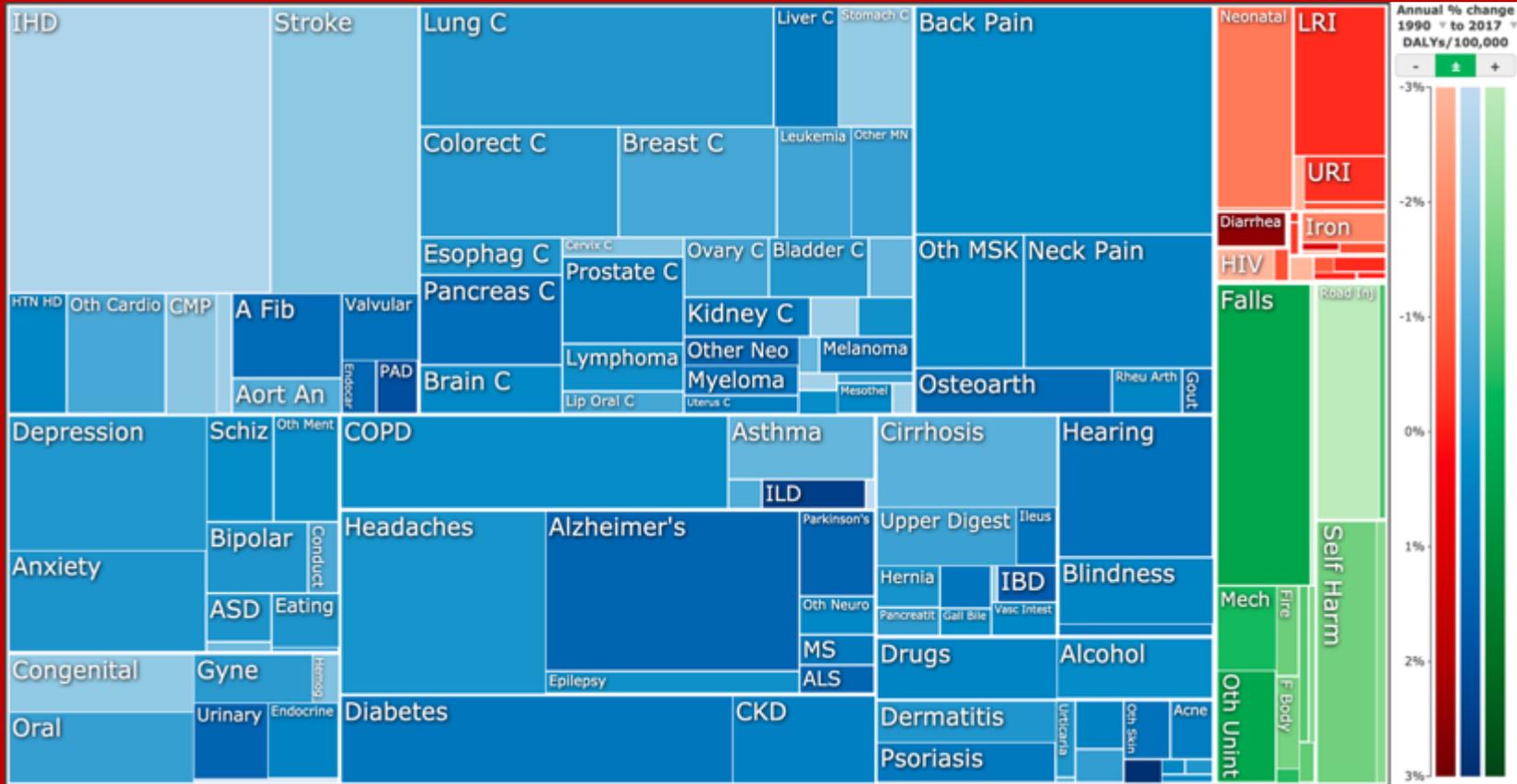
• Some differences in risk

• Cancer	Euro	NA
• 1 ACE	8%↑	10%↑
• 2+ ACEs	58%↑	25%↑

# Disability Adjusted Life Years



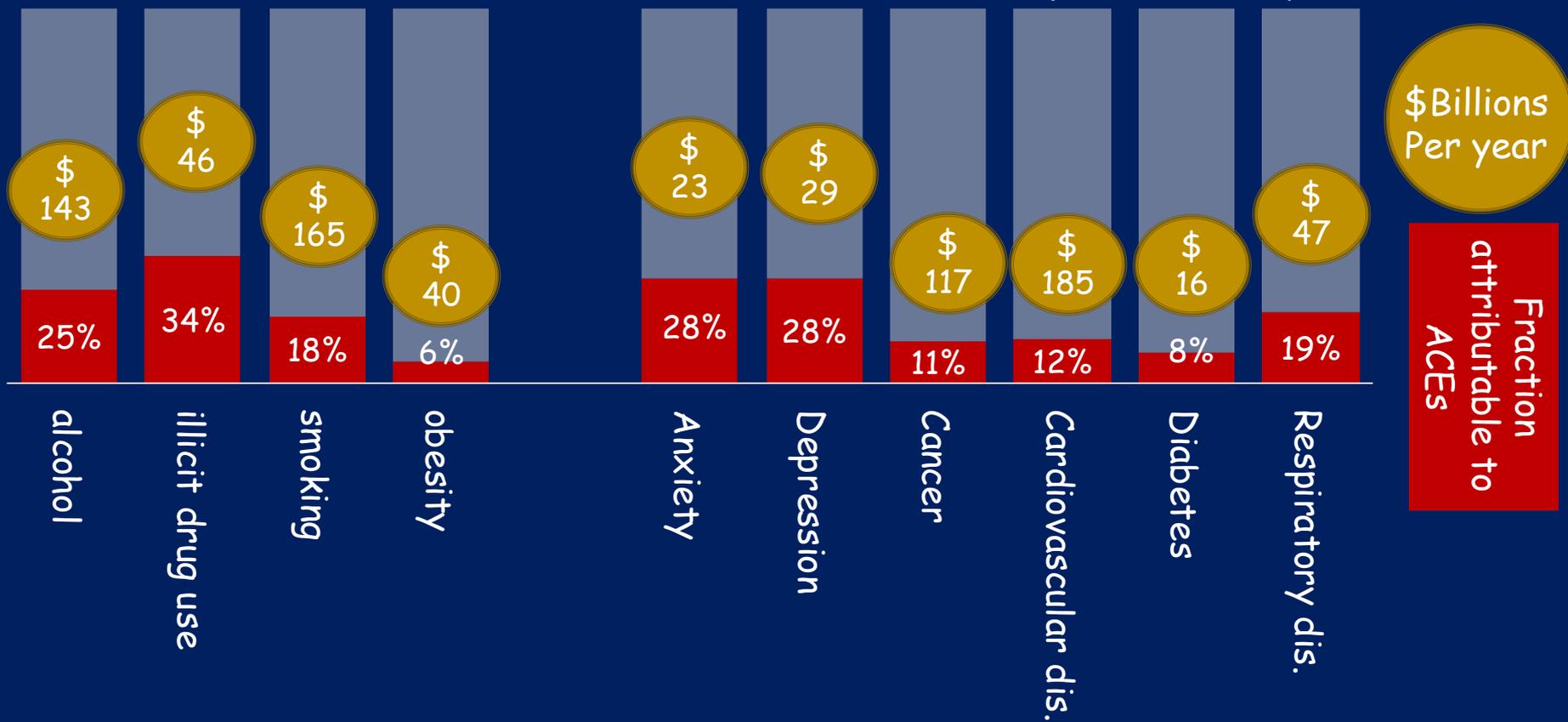
Western Europe, Both  
Sexes, All Ages, 2017



# The Costs of ACEs across Europe

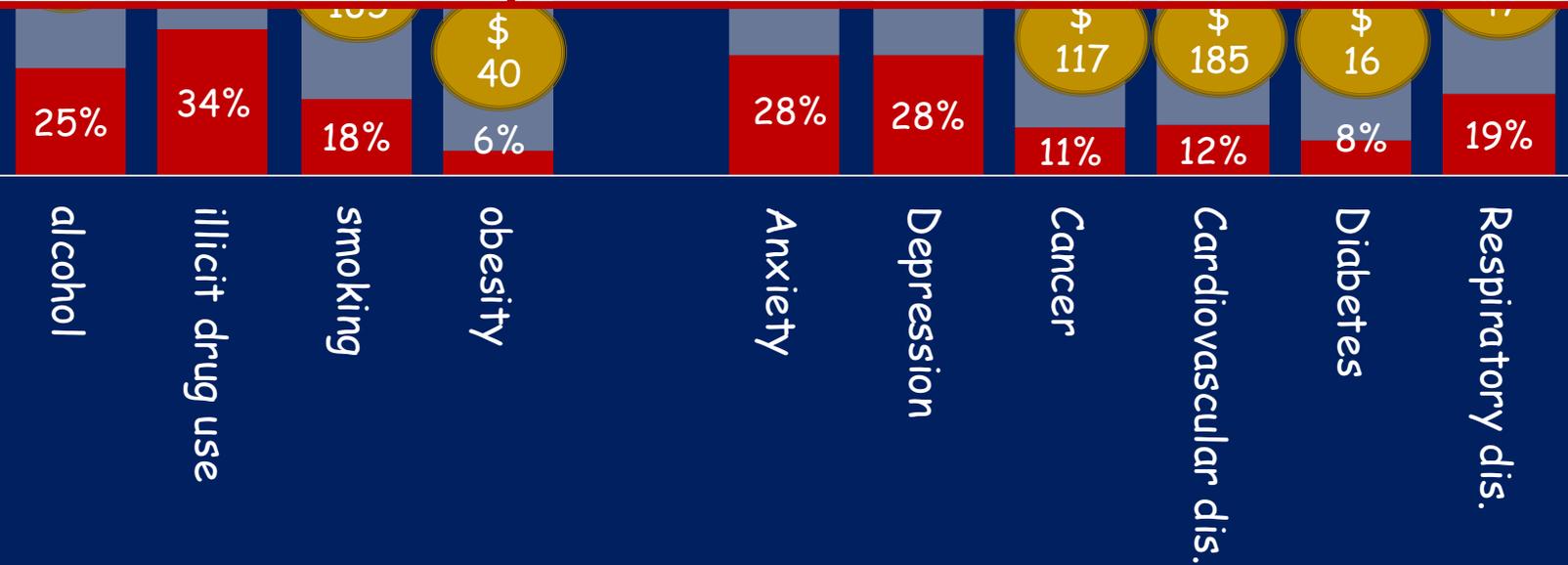
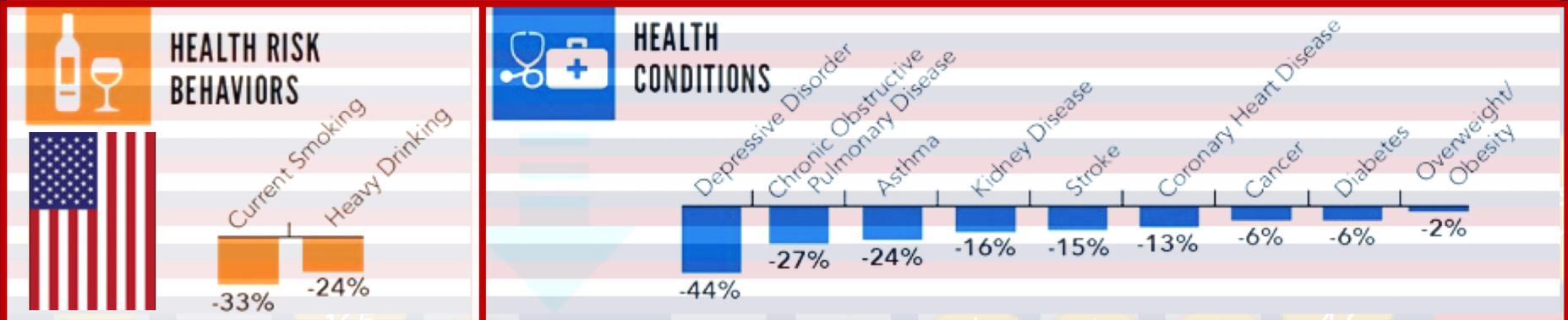


**HUMAN CAPITAL MODEL**- assign a monetary value to loss of health calculated as reduced or lost economic productivity.



**MINIMUM COST to Europe per Year \$581 BILLION and combined with NORTH AMERICA \$1.3 Trillion**

# The Costs of ACEs across Europe



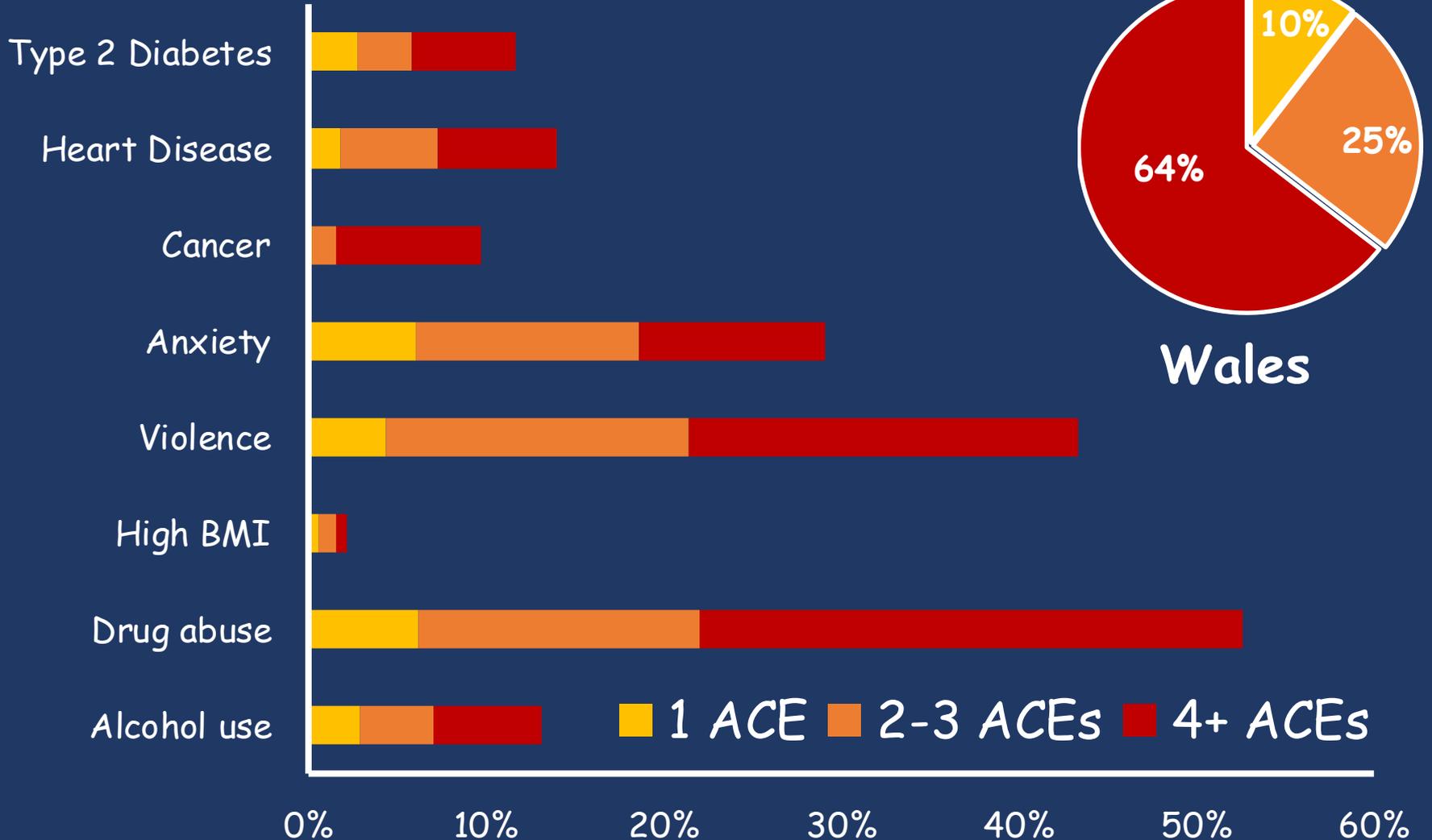
Fraction attributable to ACEs

MINIMUM COST to Europe per Year \$581 BILLION and combined with NORTH AMERICA \$1.3 Trillion

# OUTCOMES

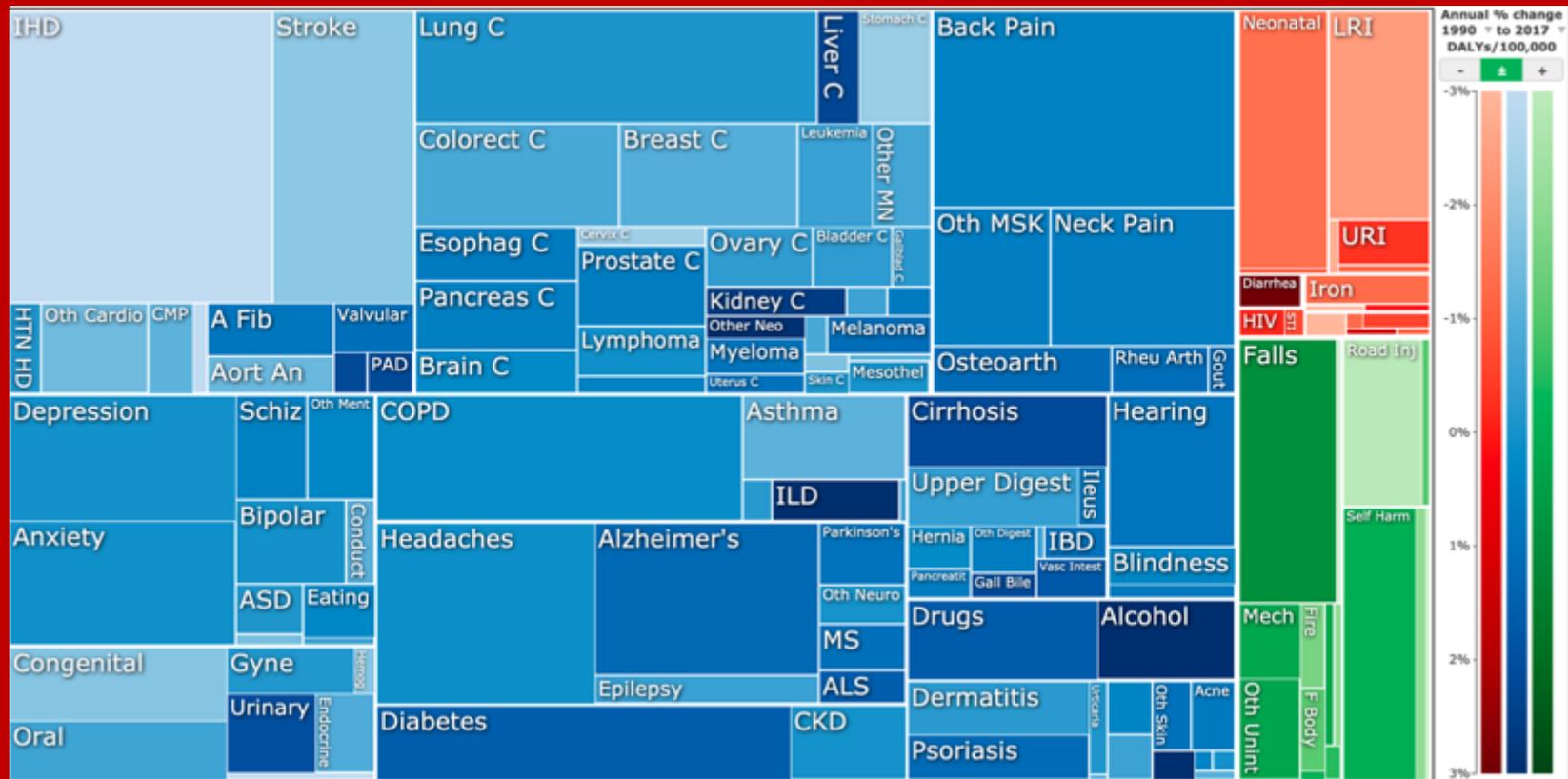
- 2+ACEs account for around 3/4 of costs
- Costs fall on
  - Whole population (\$1,000 person per year- Euro & NA)
  - Health, Education, Crime, Social sectors
- Maltreatment, other ACEs and their Cost are preventable
  - INSPIRE and other cost-effective model
- At a Country level possible to
  - Measure more accurately how major health conditions and care costs are related ACEs
  - Other costs (criminal) related to ACEs
  - Potential savings from investing in prevention of child maltreatment and other adversity

# Population Attributable Fractions England



# Northern Ireland Gross Domestic Product - 2017 (2018 prices) - £26,014 per capita

Northern Ireland,  
Both Sexes, All Ages,  
2017



# Annual Costs of ACEs in Northern Ireland

## HEALTH RISKS



High BMI



Alcohol use



Drug use



Smoking

## CAUSES OF ILL HEALTH



Violence



Type 2 diabetes



Stroke



Respiratory disease



Depression



Anxiety



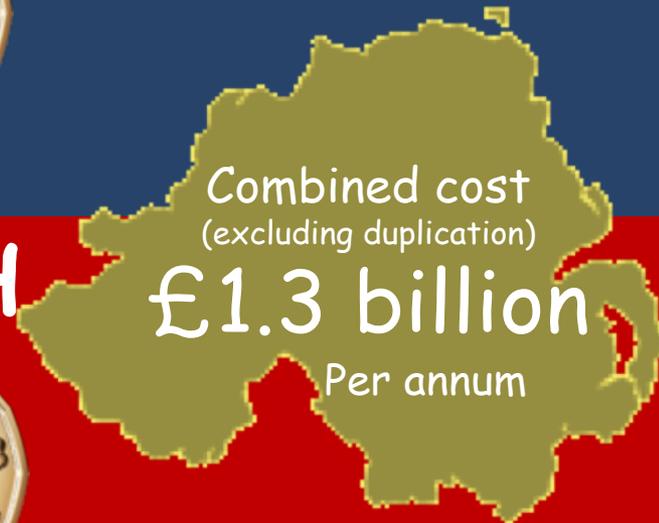
Other mental illness



Cancer



Heart disease



## Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: a systematic review and meta-analysis

Mark A Bellis, Karen Hughes, Kit Ford, Gabriela Ramos Rodriguez, Dinah Sethi, Jonathan Passmore

### Summary

**Background** An increasing number of studies are identifying associations between adverse childhood experiences (ACEs) and ill health throughout the life course. We aimed to calculate the proportions of major risk factors for and causes of ill health that are attributable to one or multiple types of ACE and the associated financial costs.

**Methods** In this systematic review and meta-analysis, we searched for studies in which risk data in individuals with ACEs were compared with those data in those without ACEs. We searched six electronic databases (MEDLINE, CINAHL, PsycINFO, Applied Social Sciences Index and Abstracts, Criminal Justice Databases, and the Education Resources Information Center) for quantitative studies published between Jan 1, 1996, and July 11, 2018, that reported risks of health-related behaviours and causes of ill health in adults that were associated with cumulative measures of ACEs (ie, number of ACEs). We included studies in adults in populations that did not have a high risk of ACEs, that had sample sizes of at least 1000 people, and that provided ACE prevalence data. We calculated the pooled RR for risk factors (harmful alcohol use, illicit drug use, smoking, and obesity) and causes of ill health (cancer, diabetes, cardiovascular disease, respiratory disease, anxiety, and depression) associated with ACEs. RRs were used to estimate the population attributable fractions (PAFs) of risk attributable to ACEs and the disability-adjusted life-years (DALYs) and financial costs associated with ACEs. This study was prospectively registered in PROSPERO (CRD4201806316).

**Findings** Of 4187 unique articles found following our initial search, after review of the titles (and abstracts, when the title was relevant), we assessed 880 (20%) full-text articles. We considered 221 (25%) full-text articles for inclusion, of which 23 (10%) articles met all selection criteria for our meta-analysis. We found a pooled prevalence of 22–5% of individuals (95% CI 18.7–28.5) with one ACE and 18.7% (16.7–23.2) with two or more ACEs in Europe (from ten studies) and of 23–4% of individuals (22.6–24.8) with one ACE and 35–0% (31.6–38.4) with two or more ACEs in north America (from nine studies). Illicit drug use had the highest PAFs associated with ACEs of all the risk factors assessed in both regions (34.1% in Europe; 41.1% in north America). In both regions, PAFs of causes of ill health were highest for mental illness outcomes. ACEs were attributed to about 30% of cases of anxiety and 40% of cases of depression in north America and more than a quarter of both conditions in Europe. Costs of cardiovascular disease attributable to ACEs were substantially higher than for most other causes of ill health because of higher DALYs for this condition. Total annual costs attributable to ACEs were estimated to be US\$581 billion in Europe and \$748 billion in north America. More than 75% of these costs arose in individuals with two or more ACEs.

**Interpretation** Millions of adults across Europe and north America live with a legacy of ACEs. Our findings suggest that a 10% reduction in ACE prevalence could equate to annual savings of 3 million DALYs or \$305 billion. Programmes to prevent ACEs and moderate their effects are available. Rebalancing expenditure towards ensuring safe and nurturing childhoods would be economically beneficial and relieve pressures on health-care systems.

**Funding** World Health Organization Regional Office for Europe.

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### Introduction

An increasing number of studies<sup>1–6</sup> have identified the long-term effects of adverse childhood experiences (ACEs) on health throughout the life course. The term ACEs refers to some of the most intense sources of stress that children can be exposed to including child maltreatment, interpersonal violence, and parental substance use. Along with immediate health and educational effects,<sup>7</sup> ACEs have been linked to higher

risks of health-harming behaviours, including smoking, harmful alcohol consumption, and drug use.<sup>8–10</sup> Exposure to ACEs is also associated with an increased risk of mental illness and other conditions, including cancer and cardiovascular disease.<sup>11–13</sup> The effect of ACEs on mental health and adoption of health-harming behaviours is one set of mechanisms connecting ACEs to chronic ill health.<sup>14</sup> However, evidence from biomedical studies<sup>15</sup> suggests that ACEs also directly



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