A TRADITION OF INDEPENDENT THINKING

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# Alcohol Policy Research: Harnessing the Global Burden of Disease Data

***Dr Zubair Kabir***
***School of Public Health***

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# Outline

- **The burden of alcohol in Ireland and Globally**
- **Data sources**
- **The Global Burden of Disease (GBD) Study**
- **The Irish GBD Alcohol Study**
- **Some concluding remarks/reflections**

Think Global Health

# On St. Patrick's Day, Ireland's Alternative to Drowning the Shamrock

by Sheila Gilheany, Eunan McKinney, Zubair Kabir

Giving a green light to measures that reduce alcohol use would cut Ireland's high rate of alcohol-related injury, death

AlcoholAction Ireland

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# Alcohol and the Irish Society

- Alcohol plays a complex role in the Irish society.
- Alcohol is no ordinary commodity.
- The societal cost of problem alcohol is estimated at €3.7 billion per year in Ireland.
- Alcohol industry had spent an estimated €116 million on advertising in 2021 alone
- Alcohol costed the Irish citizens and taxpayers €1.9 billion alone in 2021 in health-care costs

# How big is the problem in Ireland?

## How much are we drinking?

HRB Health Research Board

In 2019, on average,
Irish people aged 15 years and over drank
**10.8 litres of pure alcohol.**
This corresponds to:

**40** bottles of vodka **or** **113** bottles of wine **or** **436** pints of beer

## How Ireland compares internationally

Ireland has the
**9th highest per capita**
alcohol consumption rate of all OECD member countries

Ireland had the
**8th highest rate of monthly binge drinking**
in the world

Decrease in the proportion of drinkers aged 15–64 years – from 84% in 2002/03 to 78% in 2019/20.

**Hazardous drinking** patterns are the norm in Ireland (51% of drinkers)

# The Irish National Drug & Alcohol Surveys

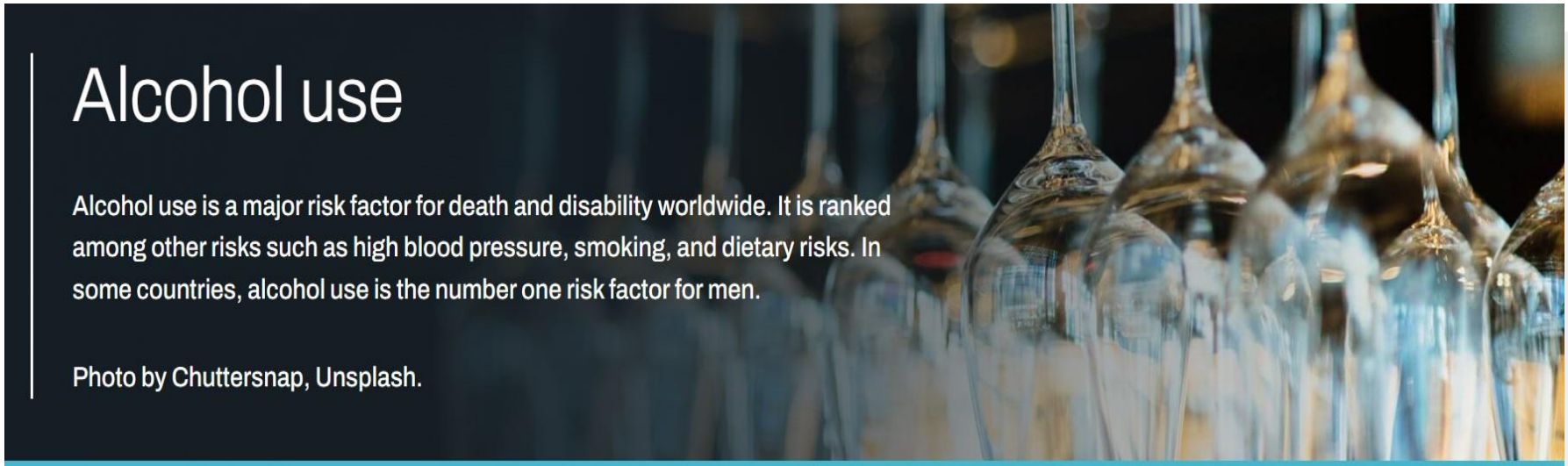


UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# Key Irish Data on Alcohol


UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# Global Burden of Alcohol Use- 2020



## Alcohol use

Alcohol use is a major risk factor for death and disability worldwide. It is ranked among other risks such as high blood pressure, smoking, and dietary risks. In some countries, alcohol use is the number one risk factor for men.

Photo by Chuttersnap, Unsplash.

**1.34 billion**
people consumed harmful amounts of alcohol in 2020.

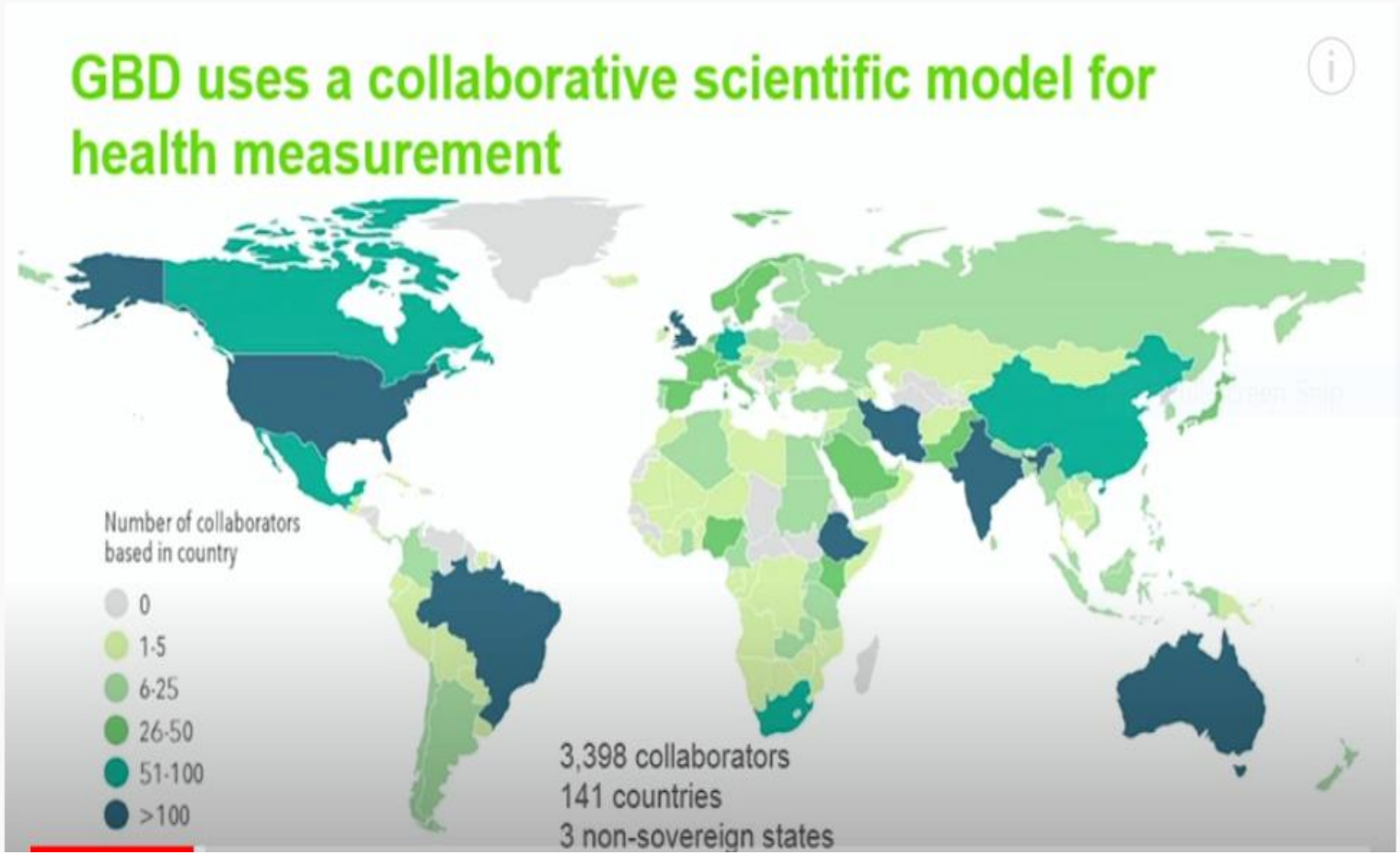
**49.3%**
of cirrhosis and other liver diseases are attributable to alcohol use.

**2.4 million**
deaths were attributable to alcohol use disorders in 2019.

**76.7%**
of people who consumed harmful amounts of alcohol were male.

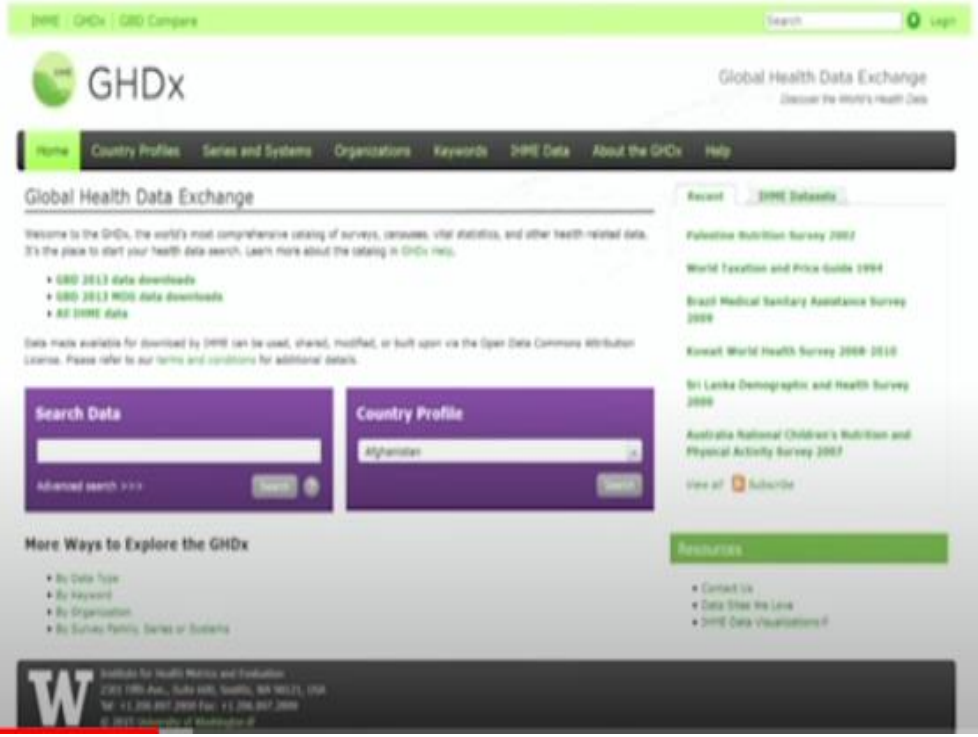
UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# GBD: a global enterprise

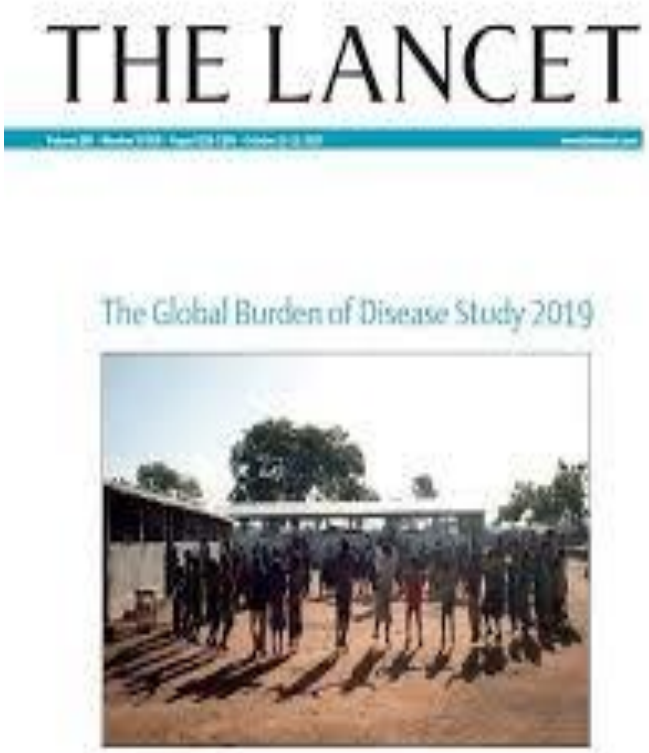


# GBD: A global public good

All data sources in the GBD indexes in on-line catalog with metadata on 100,000+ GBD sources, all code in GitHub



# Systematic and Rigorous Scientific Evidence



# The GBD 2016 Study in the Lancet, 2018

- There is no safe level for alcohol consumption

**Definition** **We define current drinkers as individuals consuming at least one alcoholic beverage in the past year. Among current drinkers, we estimate the level of exposure based on average grams of pure alcohol consumed per day.**

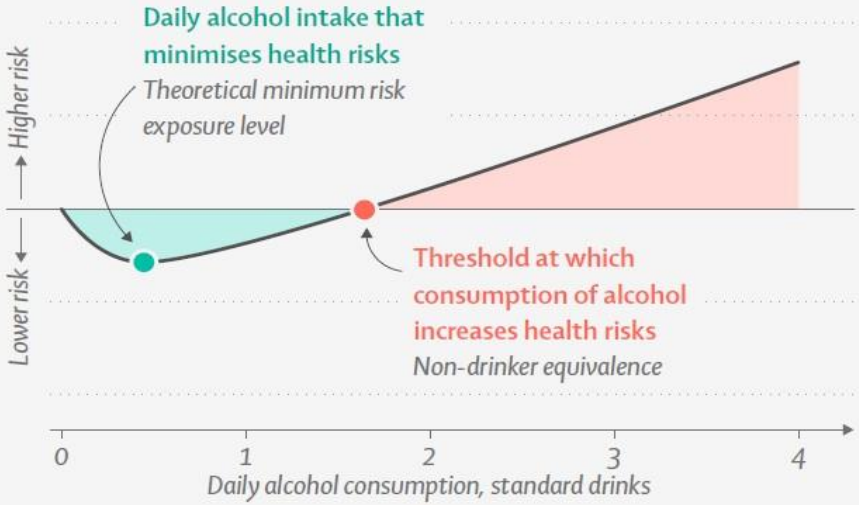
# Alcohol burden varies by age- 2020

# Understanding disease burden is key to setting effective guidelines

## Good and bad alcohol consumption

For individuals aged 40+, drinking small amounts of alcohol is not harmful to health, but drinking more than a certain amount increases health risks.

*Relative risk of alcohol consumption vs zero alcohol consumption*



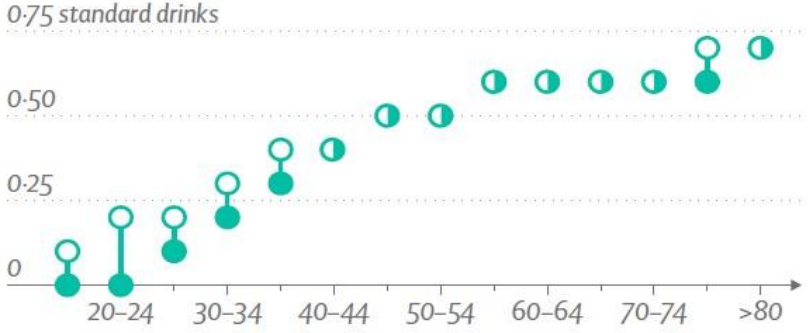

**One standard drink** is equivalent to...

10 g of ethanol = 100 mL of wine at 13% vol = 375 mL of beer at 3·5% vol

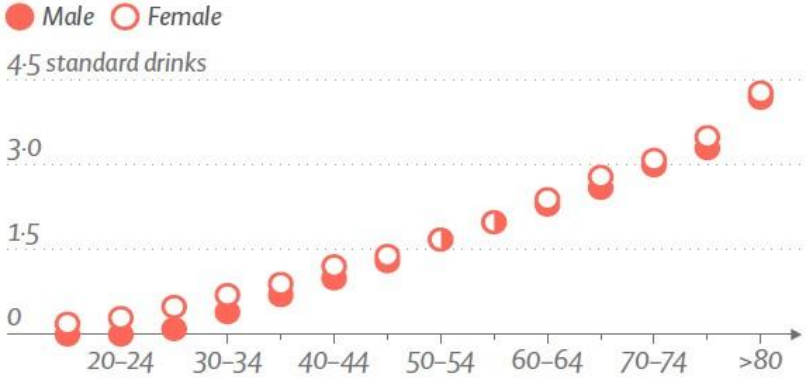
## People 40+ can safely drink small amounts of alcohol

Guidance on alcohol consumption should be based on age and location.

*Daily alcohol intake that minimises health risks, by age and sex*




*Daily threshold at which health risks increase, by age and sex*



# Which estimates are accurate and reliable?

- Data Sources? Sales data?
- Estimation Process/Statistical Modelling?
- *ALL ABOUT MEASUREMENTS!*
- *How do you estimate population-level alcohol consumption?*
- *How do you assess the risk-outcome curve of alcohol and the health-related outcomes?*

# "Big Data" and Precision Public Health

- The GBD 2016 Study used data from **694 studies** to estimate the rate of drinking alcohol across the world
- **592 studies** including 28 million people worldwide, to study the health risks associated with alcohol between 1990 to 2016 in **195 countries**
- **~10000 global collaborators**
- **~70 core modellers at the IHME (Institute for Health Metrics & Evaluation) in Seattle, US**

# Methodological Challenges

## GBD: standardized solution to global health measurement challenges

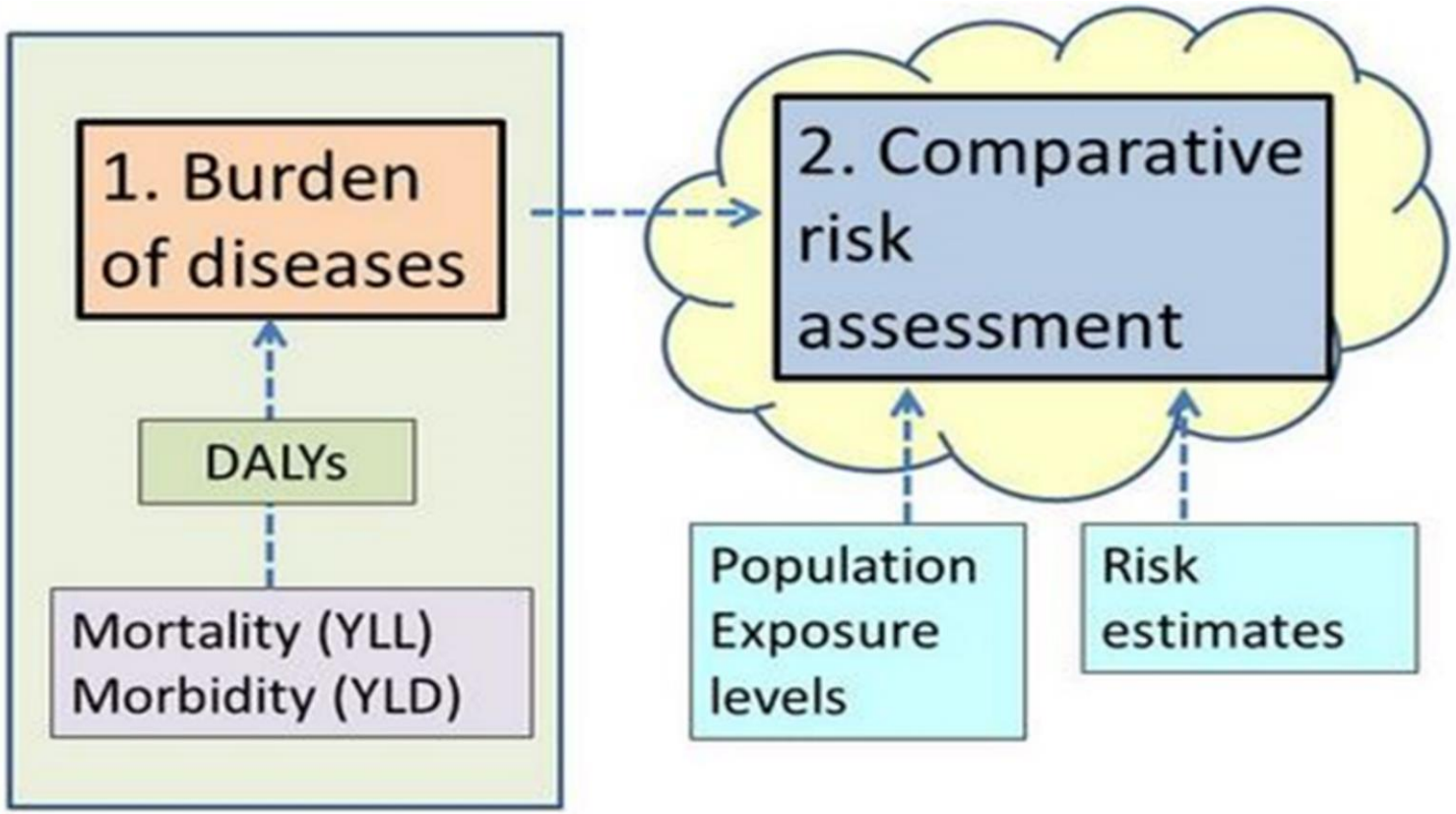
Challenges:

1. Inconsistent coding and case definitions
2. No data
3. Conflicting data
4. Sampling and non-sampling measurement error
5. Excluded groups

GBD solutions:

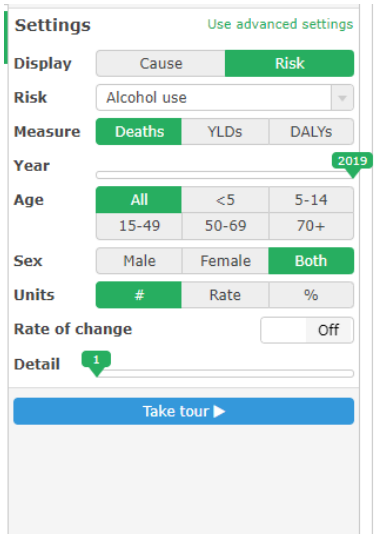
1. Quality review of all sources and corrections for garbage coding
2. Cross-walking different case definitions, diagnostic technologies, recall periods, etc., using statistical methods
3. Statistical methods to deal with missing data, inconsistent data, excluded groups and measurement error

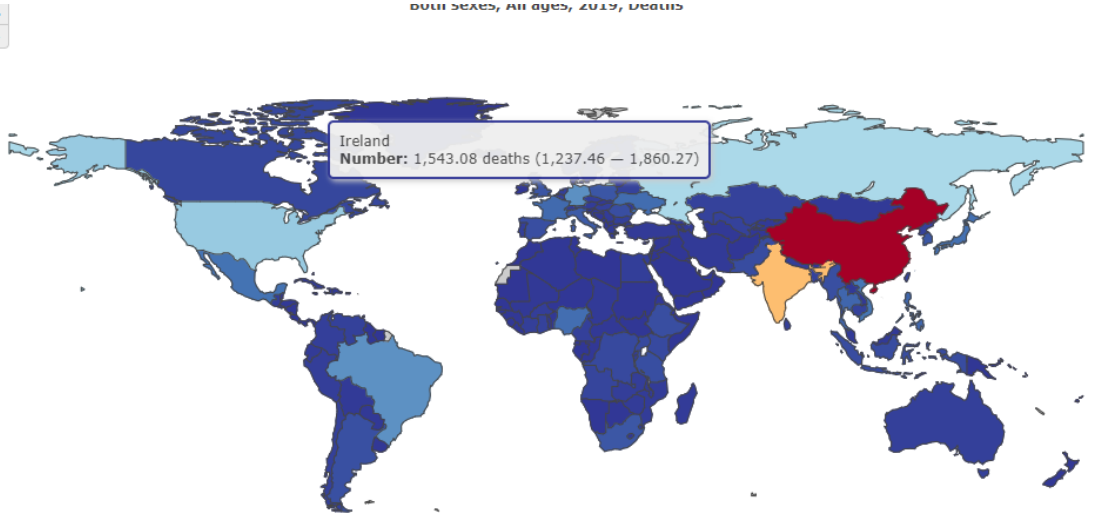
# DALY:
# Disability Adjusted Life Years



# GBD Compare | IHME Viz Hub (healthdata.org)

- Disability-Adjusted-Life-Years (DALYs) and age-standardised death rates attributable to alcohol were estimated using the GBD **comparative risk assessment framework**




University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# What is new in GBD 2019?

*What is new in GBD 2019?*

- We added 488 new data sources, including 286 for locations that previously did not have any data.
- We made changes to supply-side estimates, including adding Euromonitor data, using imputation to remove compositional bias, and revising estimation of unrecorded consumption in countries with low recorded consumption or no available data.
- We improved the gamma distribution fit by predicting standard deviation based on method developed by Kehoe et al.
- We used ST-GPR to model drinking prevalence and mean grams per day. Previously these were modelled using DisMod-MR.
- We estimated region-specific sex ratios using MR-BRT. Previously, global sex ratios were estimated within DisMod-MR.
- We estimated alcohol-attributable burden for all cirrhosis aetiologies except for cirrhosis due to non-alcoholic fatty liver disease (NAFLD).

- Three parameters for population-level alcohol consumption levels:
  - Abstention (25%)
  - Tourist information
  - Unrecorded information (illicit sales, etc)

# GBD Alcohol Irish Study 2019

| Sex | Total attributable deaths (95% uncertainty interval) | Attributable death rate per 100,000 | Attributable deaths as a % of total deaths |
|---|---|---|---|
| All | 1543 (1237-1860) | 31 (25 - 38) | 4.77 (3.86 - 5.75) |
| Male | 1104 (896 - 1327) | 45 (37 - 55) | 6.6 (5.37 - 7.93) |
| Female | 439 (295 - 599) | 18 (12 - 24) | 2.81 (1.86 - 3.79) |

AlcoholAction Ireland

UCC University College Cork, Ireland Coláiste na hOllscoile Corcaigh

# Alcohol Attributable Deaths in Ireland (n=1,543)

| Condition | Rank | Deaths (95% UI) |
|---|---|---|
| Neoplasms | 1 | 635 (543 - 735) |
| Digestive Diseases | 2 | 306 (240 - 371) |
| Cardiovascular Diseases | 3 | 162 (21 - 370) |
| Respiratory & TB | 4 | 146 (71 - 224) |
| Self-harm & Violence | 5 | 123 (70 - 179) |
| Substance Use Disorders | 6 | 95 (78 - 106) |
| Unintentional Injuries | 7 | 39 (19 - 67) |
| Neurological Disorders | 8 | 19 (14 - 25) |
| Others | 9 | 18 |
| TOTAL | | 1543 (1237- 1860) |

AlcoholAction Ireland

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# Top 10 Alcohol-related conditions in Ireland

| Condition | Risk Factor Attribution for deaths (95% uncertainty interval) |
|---|---|
| Cirrhosis and other Liver Disease | 73% (57 – 78) |
| Pharyngeal Ca | 54% (44 – 62) |
| Lip and Oral Cavity Ca | 50% (42 – 58) |
| Pancreatitis | 44% (33 – 58) |
| Liver Ca | 37% (27 – 47) |
| TB | 37% (26 – 47) |
| Oesophageal Ca | 31% (24 - 39) |
| Laryngeal Ca | 31% (19 – 41) |
| Self Harm | 27% (15 – 39) |
| Interpersonal Violence | 19% (11 – 27) |

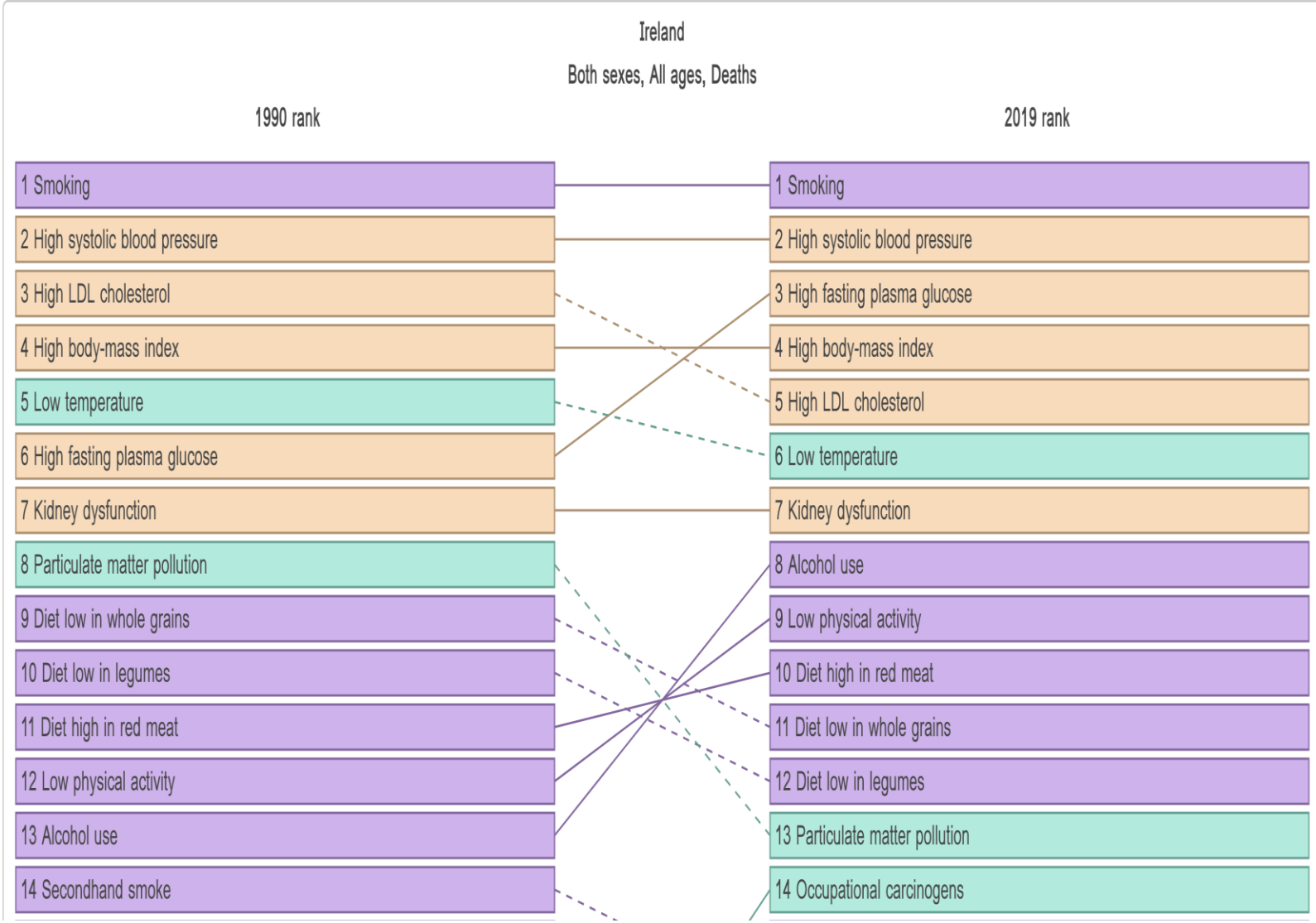
# DALYs Lost, 2019

| Sex | Total attributable DALYs (95% uncertainty interval) | Attributable DALYs rate per 100,000) | Attributable DALYs as a % of total DALYs |
|---|---|---|---|
| All | 62237(52062 - 73939) | 1267 (1060 - 1506 | 5.24 (4.56 - 6.01) |
| Male | 44538 (37377 - 52277) | 1834 (1539 - 2152) | 7.56 (6.61 - 8.57) |
| Female | 17669 (14096 – 22191) | 713 (568 - 894) | 2.97 (2.41 - 3.55) |

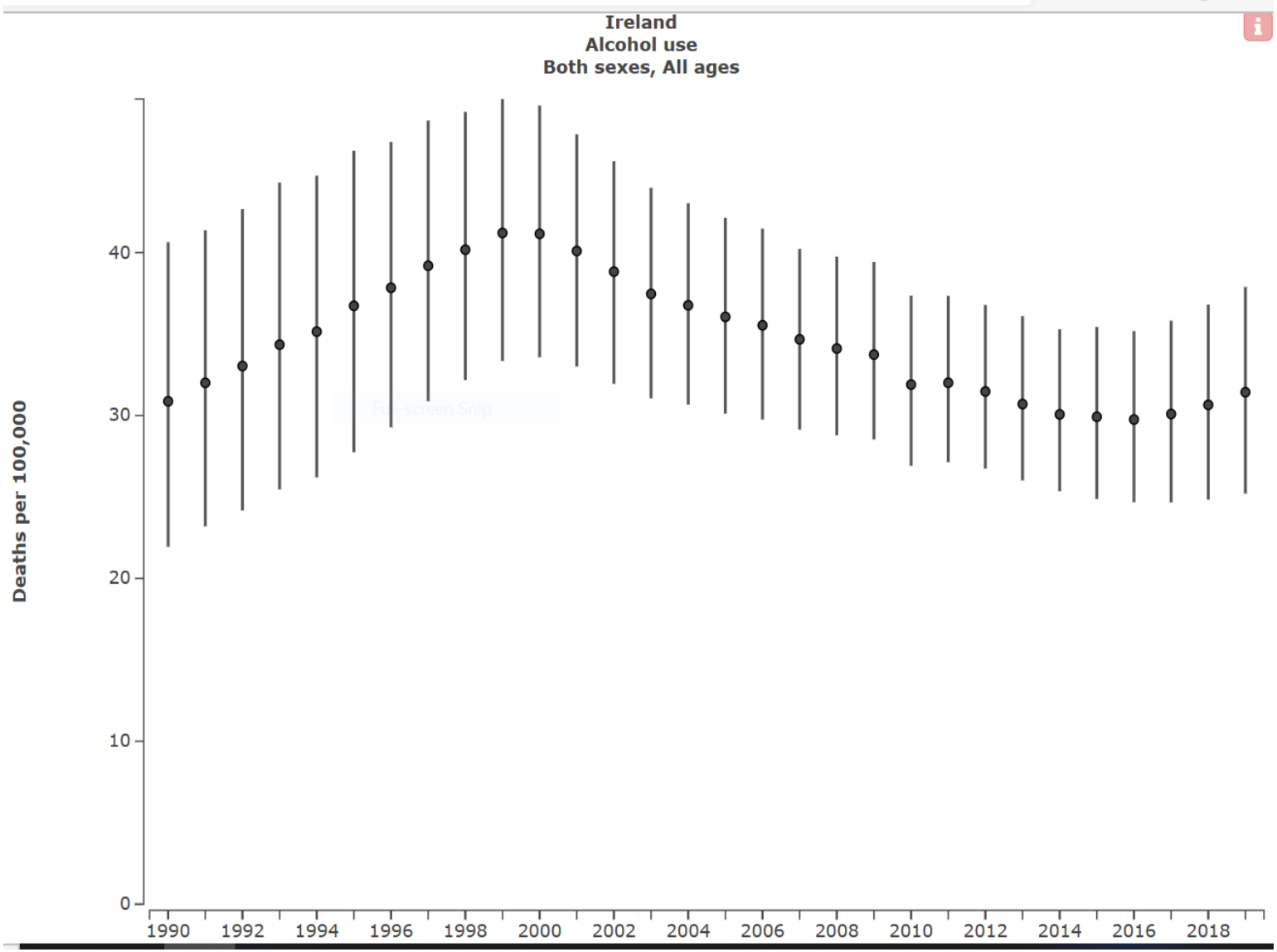
AlcoholAction Ireland

UCC University College Cork, Ireland Coláiste na hOllscoile Corcaigh

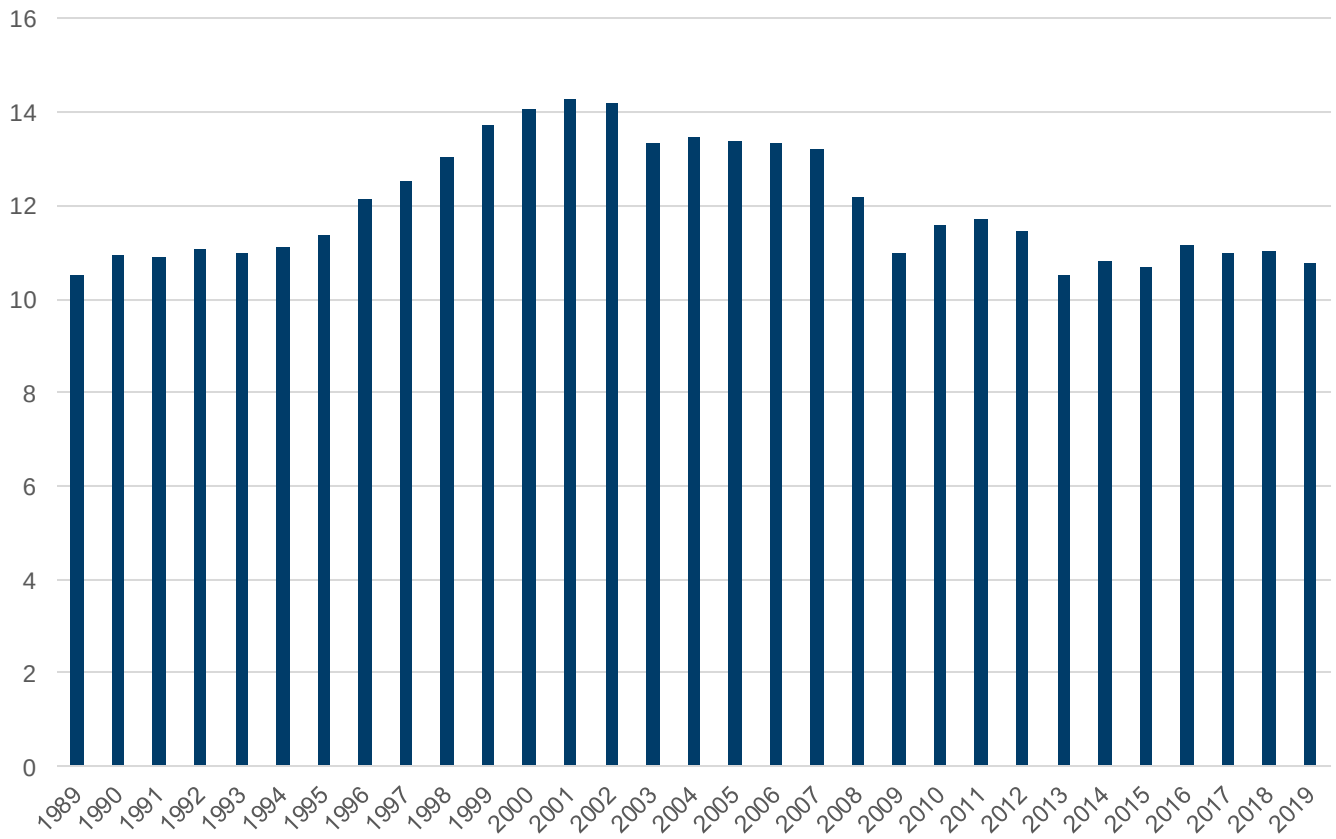
# Ranking: 1990 vs. 2019



# Death rates/100,000 Attributable to Alcohol



# Alcohol consumption litres per capita, age >15 years




AlcoholAction Ireland

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# On Reflections…

- **Four people die** of alcohol every day in Ireland (**5% of all deaths**).
- The health profile of a nation depends on good health data governance and **harnessing such data**
- Strive towards timely, systematic, comprehensive, accurate, and comparable data
- **For better and robust estimates, we must harness data through sincere collaboration across the stakeholders**

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

# Acknowledgements & Thank you!


- The **Irish Research Council** for the New Foundation Award

- **Alcohol Action Ireland**
  - Dr Sheila Gilheany
  - Mr Eunan McKinney
  - Ms Kristina Kit

- **School of Public Health,** UCC
  - Dr Orla Cotter
  - Ms Caroline Seacy


UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh