

# Does research output on interventions for two behavioural risk factors correlate with their respective burden of ill health in countries at differing World Bank income levels?

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## Abstract

**Background:** Alcohol and drug use (A&D) and dietary risks are two increasingly important risk factors. This study examines whether there is an association between the burden of these risk factors in countries of specific income bands as defined by the World Bank, and the number of primary studies included in Cochrane Systematic Reviews (CSRs) conducted in those countries. **Methods:** Data was extracted from primary studies included in CSRs assessing two risk factors as outcomes. For each, data was obtained on its overall burden in disability-adjusted life years (DALYs) by World Bank Income Levels and tested for an association between DALYs, the number of primary studies and participants.

**Findings:** A total of 1601 studies from 95 CSRs were included. Only 18.3% of the global burden for A&D is in high income-countries (HICs) but they produced 90.5 % of primary studies and include 99.5% of participants. Only 14.2% of the dietary risk burden is in HICs but they produced 80.5% of primary studies and included 98.1% of participants.

**Conclusions:** This study demonstrates the significant imbalance of research heavily weighted towards HICs. More initiatives with informed contextual understanding are required to address this inequality and promote health research in low and middle-income countries.

Table 1. Characteristics of primary studies included in Cochrane systematic reviews by assessed risk factors

Abbreviations: NRS, no randomized controlled study; RCT, randomised controlled trial

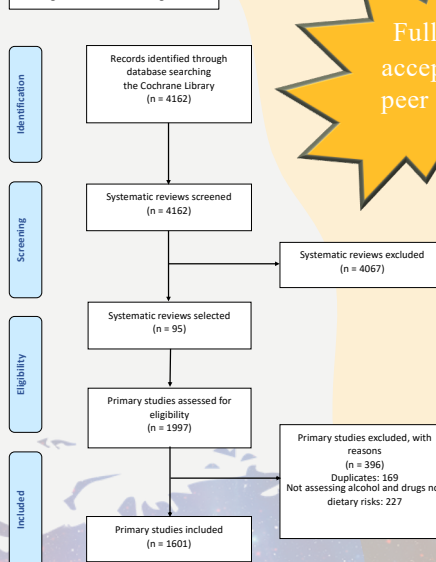
	Alcohol & drug use	Dietary risks	Total
Publication year	n (%)	n (%)	n (%)
2011 - 2018	194 (26.7)	369 (42.1)	563 (35.2)
2001 - 2010	356 (49.1)	320 (36.5)	676 (42.2)
1991 - 2000	121 (18.1)	142 (16.2)	273 (17.0)
<1990	44 (6.1)	45 (5.1)	89 (5.6)
Study design			
Cross-sectional	0 (0)	5 (0.6)	5 (0.3)
Cohort	9 (1.3)	38 (4.3)	47 (3.0)
NRS	1 (0.1)	6 (0.7)	7 (0.4)
Quasi-RCT	11 (1.5)	1 (0.1)	12 (0.7)
RCT	704 (97.1)	826 (94.3)	1530 (95.6)
World Bank Income Level			
High	685 (94.5)	705 (80.5)	1390 (86.8)
Upper middle	33 (4.5)	89 (10.2)	122 (7.6)
Lower middle	7 (1.0)	59 (6.7)	66 (4.1)
Low	0 (0)	23 (2.6)	23 (1.5)
TOTAL	725 (100)	876 (100)	1601 (100)

The Chi-square goodness of fit (CSGOF) test showed the number of primary studies was of a different distribution to both risk factors studied; A&D risk factor burden in HICs and LMICs ( $\chi^2 = 2814, p < 0.00001$ ), and dietary risk factor burden ( $\chi^2 = 3159, p < 0.00001$ ). The number of study participants was also of a different distribution to the A&D risk factor burden in HICs and LMICs ( $\chi^2 = 2081112, p < 0.00001$ ) and also between dietary risk factor burden ( $\chi^2 = 3119741, p < 0.00001$ ).

## Methods

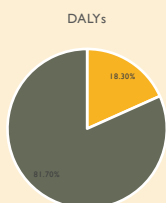
The Cochrane Database of Systematic Reviews via the Cochrane Library was searched using two filters (intervention and custom range date) to identify relevant systematic reviews (Figure 1). The reviewing authors extracted data on publication year, study design, country of first author, country where study took place, and number of participants (Table 1). For each risk factor assessed, we obtained data on its overall burden in DALYs by World Bank Country Income Levels (WBIL) grouped into high, upper-middle, lower-middle and low income from the Global Burden of Disease study 2016 (6). A descriptive analysis of characteristics of the included primary studies was performed. Data were analysed and presented in tables using frequency and percentage for categorical variables. We used the Chi squared Goodness of Fit (CSGOF) to test the null hypothesis that the number of primary studies and the number of DALYs for that risk factor grouped by income band were of the same distribution. This was repeated for the number of study participants. All statistical analyses were performed with STATA® version 11 software (7) assuming a significance level of 0.05.

Figure 1 – Prisma Diagram



## Results: Significant global imbalance of research heavily weighted towards high income countries

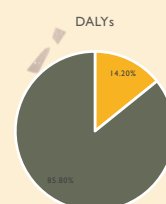
### Alcohol & Drugs



**Alcohol and Drugs:** High Income Countries bear only 18.3 % of the global burden of disease however 94.5 % of the primary studies are conducted there.

**Dietary Risks:** High Income Countries bear only 14.2% of the global burden however 80.5% of primary studies are conducted there.

### Dietary Risks



### Discussion

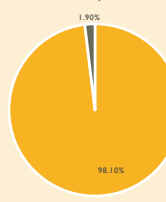
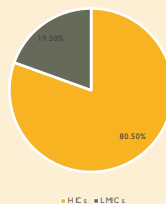
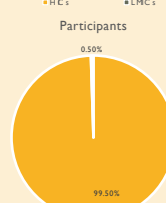
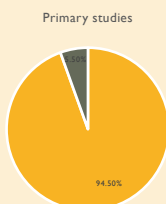
This study has detailed the scale of the disparities, for example, demonstrating that 81.7% of the burden of disease related to A&D is borne by LMICs but only 0.5% of study participants came from LMICs, despite the fact that the risk factor of A&D was 'over studied' at a global level. The results of this research highlight that more primary research needs to be conducted in LMICs for the two behavioural risk factors studied; it should not be assumed that what is effective in HICs will also be effective in LMICs, although some interventions may indeed be globally relevant. This is part of a much wider problem regarding inequities in global health research.

### Conclusion

Factors hindering research equity in LMICs are worthy of further investigation such as source of funding, language barriers to publication and broader socio-economic issues. HICs can support justice in global health by the design of grant programmes that will help adjust the disparity (13). Clearly initiatives such as increased collaboration, capacity building initiatives for health research in LMICs, increased access to related literature and more funding opportunities for LMICs will help to start to address this imbalance (14).

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Conflict of interest declaration: the authors confirm there is no conflict of interest to declare