

The contribution of unrecorded alcohol to health harm

Jürgen Rehm^{1,2,3,4,5,6}, Gerhard E. Gmel Sr.^{1,7,8,9}, Gerrit Gmel¹, Omer S. M. Hasan¹, Sameer Imtiaz^{1,3}, Svetlana Popova^{1,3,5,10}, Charlotte Probst^{1,6}, Michael Roerecke^{1,5}, Robin Room^{11,12}, Andriy V. Samokhvalov^{1,3,4}, Kevin D. Shield¹³ & Paul A. Shuper^{1,5}

Institute for Mental Health Policy Research, CAMH, Toronto, Ontario, Canada,1
Campbell Family Mental Health Research Institute, CAMH, Toronto, Ontario, Canada,2
Institute of Medical Science (IMS), University of Toronto, Toronto, Ontario, Canada,3
Department of Psychiatry, University of Toronto, Toronto, Ontario, Canada,4
Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada,5
Institute for Clinical Psychology and Psychotherapy, TU Dresden, Dresden, Germany,6
Alcohol Treatment Center, Lausanne University Hospital, Lausanne, Switzerland,7
Addiction Switzerland, Lausanne, Switzerland,8
University of theWest of England, Bristol,UK,9
Factor-Inwentash Faculty of Social Work, University of Toronto, Ontario, Canada,10
Centre for Alcohol Policy Research, La Trobe University, Melbourne, Victoria, Australia,11
Centre for Social Research on Alcohol and Drugs, Stockholm University, Stockholm, Sweden12
Section of Cancer Surveillance, International Agency for Research on Cancer, Lyon, France13

running head: unrecorded alcohol and health

Word count: 585

conflict of interest declaration: none

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as doi: [10.1111/add.13865](https://doi.org/10.1111/add.13865)

We thank Drs. Lachenmeier and Walch (1) for their commentary on our review (2), where they highlight quality of unrecorded alcohol as a relevant dimension for alcohol-attributable burden of disease. Unrecorded alcohol includes some categories (3), which have mostly been produced in the same circumstances as recorded alcoholic beverages and then diverted or legally brought across jurisdictions. But other unrecorded categories often are not controlled for quality the same way as usual alcoholic beverages, either because they are produced at home or illegally, or because they are not intended for human consumption (such as medicinal tinctures; (4)). In many high-income countries, these non-standardised products probably account for less than half of the unrecorded alcohol (e.g., (5, 6)) but in low- and middle-income countries the proportion is usually much higher. An estimated 25% of the global alcohol consumption being estimated as unrecorded (7), and this proportion being highest in low- and middle income countries (8). Estimating the contribution of unrecorded alcohol to the alcohol-attributable burden of disease correctly thus is crucial for comparative risk assessments (9, 10). The arguments of Lachenmeier and Walch (1) raise two questions: 1) should we estimate attributable burden for all or part of unrecorded alcohol with different relative risk functions than for recorded alcohol?; and 2) are we confident about the inclusion of all the deaths from substances such as methanol under alcohol-attributable deaths?

To answer the first question, at the moment, based on prior reviews (3, 11), the same relative risk functions are used for unrecorded consumption as for recorded consumption in the estimation of the burden of disease (2). This approach still seems justified, as no new evidence on differential relative risks is available, and to date, the few studies that have found higher risks (12) could potentially be explained by heavy or very heavy drinking occasions, in part due to the lower price of unrecorded alcohol. We believe, that the burden lies with those claiming higher risks for unrecorded consumption to provide empirical evidence in support of this assertion.

The second question raised (1) is more complicated to answer. Overall, the contribution of alcohol poisoning is underestimated globally for four reasons: firstly, many estimates are restricted to ethanol and do not include substances such as methanol (i.e., methanol poisoning; see (1)); secondly, there is frequent miscoding of alcohol poisoning deaths as cardiovascular deaths, albeit not to the degree that could explain the detrimental impact of alcohol on cardiovascular disease (13, 14); thirdly, incidence and prevalence of all fully alcohol-attributable causes of death are underestimated because of stigma (15); and finally, there is underestimation because alcohol as a contributory cause to illicit drug overdose deaths is usually not reflected on death certificates (e.g., (16)). In this sense, Lachenmeier and Walch (1) should be taken as a plea to improve future statistics on alcohol poisonings to include unrecorded consumption.

Finally, we agree strongly (1) that additional research on unrecorded consumption in relation to burden of disease is needed. This research needs to recognize that “unrecorded alcohol” includes subcategories with varying likelihoods of contamination, and that contaminants may vary with customary methods of brewing or distilling the alcohol. Based on toxicological knowledge and past research (3), most of these contaminants will not impact on risk for disease above alcohol, but some may, varying considerably across cultures and by geography (e.g., (17, 18)). Thus, it would probably be a long time before the results are robust enough to be used in global burden of disease estimates, even if new research is initiated.

References

1. LACHENMEIER, DW & WALCH, SG (2017) Commentary on Rehm et al. (2017): Composition of alcoholic beverages—an under-researched dimension in the global comparative risk assessment, *Addiction*, 112, 1002-1003.
2. REHM, J, GMEL, GE SEN., GMEL, G, HASAN, OSM, IMTIAZ, S, POPOVA, S et al. (2017) The relationship between different dimensions of alcohol use and the burden of disease - an update, *Addiction*, 112, 968-1001.
3. REHM, J, KAILASAPILLAI, S, LARSEN, E, REHM, MX, SAMOKHVALOV, AV, SHIELD, KD et al. (2014) A systematic review of the epidemiology of unrecorded alcohol consumption and the chemical composition of unrecorded alcohol, *Addiction*, 109, 880-893.
4. LACHENMEIER, DW, GMEL, G & REHM, J (2013) Unrecorded alcohol consumption, in: Boyle, P., Boffetta, P., Lowenfels, A. B. et al. (Eds.) *Alcohol: Science, Policy, and Public Health*, pp. 132-142 (Oxford, U.K., Oxford University Press).
5. LEIFMAN, H (2001) Estimations of unrecorded alcohol consumption levels and trends in 14 European countries, *Nordisk Alkohol- and Narkotikatidskrift*, 18, 54-70.
6. MACDONALD, S, WELLS, S & GIESBRECHT, N (1999) Unrecorded alcohol consumption in Ontario, Canada: estimation procedures and research implications, *Drug Alcohol Rev*, 18, 21-29.
7. WORLD HEALTH ORGANIZATION (2014) *Global status report on alcohol and health* (Geneva, Switzerland, World Health Organization).
8. REHM, J, LARSEN, E, LEWIS-LAIETMARK, C, GHEORGHE, P, POSNYAK, V, REKVE, D et al. (2016) Estimation of unrecorded alcohol consumption in low-, middle-, and high income economies for 2010, *Alcohol Clin Exp Res*, 40, 1283-1289.
9. GBD 2015 RISK FACTORS COLLABORATORS (2016) Global, regional, and national comparative risk assessment of 79 behavioral, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015, *Lancet*, 388, 1659-1724.
10. REHM, J & IMTIAZ, S (2016) Alcohol consumption as a risk factor for global burden of disease. A narrative review, *Subst Abuse Treat Prev Policy*, 11, 37.
11. REHM, J, KANTERES, F & LACHENMEIER, DW (2010) Unrecorded consumption, quality of alcohol and health consequences, *Drug Alcohol Rev*, 29, 426-436.

12. LEON, DA, SABUROVA, L, TOMKINS, S, ANDREEV, E, KIRYANOV, N, MCKEE, M et al. (2007) Hazardous alcohol drinking and premature mortality in Russia: a population based case-control study, *Lancet*, 369, 2001-2009.
13. ZARIDZE, D, MAXIMOVITCH, D, LAZAREV, A, IGOV, V, BORODA, A, BOREHAM, J et al. (2009) Alcohol poisoning is a main determinant of recent mortality trends in Russia: evidence from a detailed analysis of mortality statistics and autopsies, *Int J Epidemiol*, 38, 143-153.
14. SHKOLNIKOV, VM, MCKEE, M, CHERVYAKOV, VV & KYRIANOV, NA (2002) Is the link between alcohol and cardiovascular death among young Russian men attributable to misclassification of acute alcohol intoxication? Evidence from the city of Izhevsk, *J Epidemiol Community Health*, 56, 171-174.
15. REHM, J, HASAN, OSM, IMTIAZ, S & NEUFELD, M (2017) Quantifying the contribution of alcohol to cardiomyopathy: a systematic review, *Alcohol*, epub ahead of press.
16. LAHTI, RA, SAJANTILA, A, KORPI, H, POIKOLAINEN, K & VUORI, E (2011) Under-recording of ethanol intoxication and poisoning in cause-of-death data: causes and consequences, *Forensic Sci Int*, 212, 121-125.
17. SOLODUN, YV, MONAKHOVA, YB, KUBALLA, T, SAMOKHVALOV, AV, REHM, J & LACHENMEIER, DW (2011) Unrecorded alcohol consumption in Russia: toxic denaturants and disinfectants pose additional risks, *Interdiscip Toxicol*, 4, 198-205.
18. OKARU, AO, ABUGA, KO, KIBWAGE, IO, HAUSLER, T, LUY, B, KUBALLA, T et al. (2017) Aflatoxin contamination in unrecorded beers from Kenya – a health risk beyond ethanol, *Food Control*, 79, 344-348.



Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:

Rehm, J; Gmel, G; Hasan, OSM; Imtiaz, S; Popova, S; Probst, C; Roerecke, M; Room, R; Samokhvalov, AV; Shield, KD; Shuper, PA

Title:

THE CONTRIBUTION OF UNRECORDED ALCOHOL TO HEALTH HARM

Date:

2017-09-01

Citation:

Rehm, J., Gmel, G., Hasan, O. S. M., Imtiaz, S., Popova, S., Probst, C., Roerecke, M., Room, R., Samokhvalov, A. V., Shield, K. D. & Shuper, P. A. (2017). THE CONTRIBUTION OF UNRECORDED ALCOHOL TO HEALTH HARM. ADDICTION, 112 (9), pp.1687-+. <https://doi.org/10.1111/add.13865>.

Persistent Link:

<http://hdl.handle.net/11343/293084>

File Description:

Accepted version