

Global burden of cancers attributable to liver flukes

Martyn Plummer and colleagues (September, 2016)¹ analyse the global burden of cancers attributable to infections in 2012. Despite the relatively low attributable proportion compared with other infectious agents, liver flukes, including *Opisthorchis viverrini* and *Clonorchis sinensis*, were estimated to have caused 1300 new cases of cholangiocarcinoma in 2012. However, this number might underestimate the real situation.

As described in Plummer and colleagues¹ appendix, parameters applied in estimation included the baseline incidence of cholangiocarcinoma from cancer registry data in Japan, the relative risk (RR) of cholangiocarcinoma in those infected with liver flukes, and the population with liver fluke infections. However, Fürst and colleagues² used a different approach and reached an annual figure for new cholangiocarcinoma cases attributable to liver flukes of nearly 7000 (table). In that study, odds ratios (ORs) of 4.39 for *O viverrini* and 6.12 for *C sinensis* were combined with the cholangiocarcinoma incidence of a population highly affected by *O viverrini* in northeast Thailand. In our earlier study,³ we also attempted to analyse the cholangiocarcinoma cases attributable to *C sinensis*, using data from South Korea. After extrapolation to the global infected population, we estimate that more than 4700 cholangiocarcinoma cases were attributable to this organism, which approaches the figure of 5591 estimated by Fürst and colleagues² (table).

The figure for the infected population in Plummer and colleagues¹ analysis is similar to those of the two other studies,^{2,3} and the OR is higher. Thus, their

	Number of infected population	Relative risk or odds ratio	Cases of cholangiocarcinoma attributed to infection
Plummer et al (2016)¹			
<i>Opisthorchis viverrini</i>	Not extracted from article	7.7	Not extracted from article
<i>Clonorchis sinensis</i>	Not extracted from article	7.7	Not extracted from article
Total	24 400 000	..	1300
Fürst et al (2012)²			
<i>O viverrini</i>	8 028 503	4.39	1323
<i>C sinensis</i>	15 313 219	6.12	5591
Total	23 341 722	..	6914
Qian et al (2012)³			
<i>C sinensis</i>	15 110 344	4.47	4726

Table: Analyses of new annual cases of cholangiocarcinoma attributed to liver flukes worldwide

substantially lower estimation of the number of cholangiocarcinoma cases attributable to liver flukes arises from the introduction of baseline cholangiocarcinoma data from Japan. The raw data from case-control studies used to calculate combined ORs were done in liver-fluke-endemic areas. Therefore, the lower cholangiocarcinoma incidence in Japan could not represent that in the control populations in these studies.

Because of inadequate studies and insufficient data, and the complex and chronic characteristics of cancers, it is challenging to capture an accurate estimate of the number of cholangiocarcinoma cases attributable to liver flukes.⁴ Thus, more research is needed, which will have the added benefit of raising awareness of the importance of liver flukes in east Asia and promote control and elimination.

We declare no competing interests.

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- 1 Plummer M, de Martel C, Vignat J, Ferlay J, Bray F, Franceschi S. Global burden of cancers attributable to infections in 2012: a synthetic analysis. *Lancet Glob Health* 2016; **4**: e609–16.
- 2 Fürst T, Keiser J, Utzinger J. Global burden of human food-borne trematodiasis: a systematic review and meta-analysis. *Lancet Infect Dis* 2012; **12**: 210–21.
- 3 Qian MB, Chen YD, Liang S, Yang GJ, Zhou XN. The global epidemiology of clonorchiasis and its relation with cholangiocarcinoma. *Infect Dis Poverty* 2012; **1**: 4.
- 4 Qian MB, Utzinger J, Keiser J, Zhou XN. Clonorchiasis. *Lancet* 2016; **387**: 800–10.