



This paper was originally published by the BMJ Publishing Group as:

Gigerenzer, G., & Kolpatzik, K. (2017). **Authors' reply to Workman.** *BMJ*, 358, Article j3281. <https://doi.org/10.1136/bmj.j3281>

This publication is with permission of the rights owner freely accessible due to an Alliance licence and a national licence (funded by the DFG, German Research Foundation) respectively.

### **Nutzungsbedingungen:**

Dieser Text wird unter einer Deposit-Lizenz (Keine Weiterverbreitung - keine Bearbeitung) zur Verfügung gestellt. Gewährt wird ein nicht exklusives, nicht übertragbares, persönliches und beschränktes Recht auf Nutzung dieses Dokuments. Dieses Dokument ist ausschließlich für den persönlichen, nicht-kommerziellen Gebrauch bestimmt. Auf sämtlichen Kopien dieses Dokuments müssen alle Urheberrechtshinweise und sonstigen Hinweise auf gesetzlichen Schutz beibehalten werden. Sie dürfen dieses Dokument nicht in irgendeiner Weise abändern, noch dürfen Sie dieses Dokument für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen. Mit der Verwendung dieses Dokuments erkennen Sie die Nutzungsbedingungen an.

### **Terms of use:**

This document is made available under Deposit Licence (No Redistribution - no modifications). We grant a non-exclusive, nontransferable, individual and limited right to using this document. This document is solely intended for your personal, non-commercial use. All of the copies of this documents must retain all copyright information and other information regarding legal protection. You are not allowed to alter this document in any way, to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public. By using this particular document, you accept the above-stated conditions of use.

### **Provided by:**

Max Planck Institute for Human Development  
Library and Research Information  
[library@mpib-berlin.mpg.de](mailto:library@mpib-berlin.mpg.de)



## LETTERS

## FACT BOXES AND MEDICAL RISK

## Authors' reply to Workman

Gerd Gigerenzer *director*<sup>1</sup>, Kai Kolpatzik *head*<sup>2</sup><sup>1</sup>Harding Center for Risk Literacy and Center for Adaptive Behavior and Cognition, Max Planck Institute for Human Development, Berlin, Germany;<sup>2</sup>Department of Prevention, General Local Health Insurance Fund (AOK-Bundesverband), Berlin, Germany

Evidence shows that, rather than saving lives, ovarian cancer screening with transvaginal ultrasonography and cancer antigen (CA-125) testing produces large numbers of false alarms. These lead to severe harms for women whose healthy ovaries are removed.<sup>1</sup> Given the evidence, the US Food and Drug Administration and the US Preventive Services Task Force recommend against ovarian cancer screening. Doctors and patients can more easily understand this and other risks when they are presented in a fact box.<sup>2</sup>

Nevertheless, 28% of US doctors have reported non-adherence to this recommendation and screen women at no risk of ovarian cancer, and 65% reported screening women at medium risk.<sup>3</sup> Over 10 000 women in Germany are estimated to have had their healthy ovaries removed in 2014 as a consequence of this harmful screening practice.<sup>1</sup> Why do doctors continue to screen for ovarian cancer?<sup>4</sup>

The answer can be found in "SIC syndrome," which plagues much of current healthcare.<sup>5</sup>

The "S" stands for self defence—doctors practise defensive medicine, defined as deviation from sound medical practice for fear of liability. Of 824 US emergency doctors, radiologists, obstetricians/gynaecologists, and surgeons—specialists at high risk of being sued—93% admitted to sometimes or often practising defensive medicine.<sup>6</sup> Failure to diagnose cancer early is a frequent cause for litigation, and attorney firms advertise their legal services to women whose doctors failed to diagnose ovarian cancer in a timely fashion.<sup>7</sup> Similarly, doctors might be concerned about their reputation if they overlook cancer, whereas false positives and unnecessary surgery are not perceived similarly. To protect themselves, many doctors think that they have no choice but to ignore guidelines and risk harming patients through overdiagnosis and overtreatment.

The "I" stands for innumeracy, specifically statistical illiteracy. Studies show that many doctors do not understand health statistics relevant for screening or uphold beliefs uninformed by the evidence from randomised trials.<sup>8</sup> For example, in a study of 1574 US doctors, 30% wrongly thought that transvaginal ultrasonography was a clinically effective test for ovarian cancer

screening for women at average risk and 18% thought the same of CA-125.<sup>9</sup>

The "C" stands for conflicts of interest. Numerous companies market tests that screen for ovarian cancers, with costs from \$35 (£27; €31) to \$250. In a business driven fee-for-service system not screening means loss of income for doctors and clinics. So doctors who practise evidence based medicine find themselves torn between their financial interests and best practice. Ovarian cancer screening generates a steady source of income, not only from the costs of the test but also from the consequences of false alarms, including unnecessary removal of ovaries and the treatment of resulting complications, such as cardiovascular disease.

As the term SIC syndrome indicates, these three causes are interconnected. A doctor who recommends screening with transvaginal ultrasonography and CA-125 might be motivated by fear of litigation and reputational concerns or by financial worries, or both. These motives are often hard to distinguish. The third cause, innumeracy, can serve as a moral blindfold so that doctors who recommend screening do not even notice that they are violating the Hippocratic oath of "first do no harm." Not knowing the evidence preserves the illusion that a harm done to patients is in their best interest.

Competing interests: None declared.

- 1 Buys SS, Partridge E, Black A, et al. PLCO Project Team. Effect of screening on ovarian cancer mortality: the Prostate, Lung, Colorectal and Ovarian (PLCO) cancer screening randomized controlled trial. *JAMA* 2011;358:2295-303. doi:10.1001/jama.2011.766 pmid: 21642681.
- 2 Gigerenzer G, Kolpatzik K. How new fact boxes are explaining medical risk to millions. *BMJ* 2017;358:j2460. doi:10.1136/bmj.j2460 pmid:28539314.
- 3 Baldwin LM, Trivers KF, Matthews B, et al. Vignette-based study of ovarian cancer screening: do U.S. physicians report adhering to evidence-based recommendations? *Ann Intern Med* 2012;358:182-94. doi:10.7326/0003-4819-156-3-201202070-00006 pmid: 22312138.
- 4 Workman SR. Why does the ovarian cancer screening box exist? *BMJ* 2017;358:j3277.
- 5 Gigerenzer G. *Risk savvy: how to make good decisions*. Viking, 2014.
- 6 Studdert DM, Mello MM, Sage WM, et al. Defensive medicine among high-risk specialist physicians in a volatile malpractice environment. *JAMA* 2005;358:2609-17. doi:10.1001/jama.293.21.2609 pmid:15928282.
- 7 Dankner Milstein. Failure to diagnose ovarian cancer. <http://www.danknermilstein.com/failure-to-diagnose-ovarian-cancer/>

- 8 Gigerenzer G, Muir Gray JM, eds. *Better doctors, better patients, better decisions*. MIT Press, 2011 doi:10.7551/mitpress/9780262016032.001.0001.
- 9 Miller JW, Baldwin LM, Matthews B, et al. Physicians' beliefs about effectiveness of cancer screening tests: a national survey of family physicians, general internists, and

obstetrician-gynecologists. *Prev Med* 2014;358:37-42. doi:10.1016/j.ypmed.2014.07.009 pmid:25038531.

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>