Many medical students don’t understand statistics

A new quick test reveals insufficient levels of statistical literacy at universities

Berlin, 22 October 2018 – Effective health care cannot exist without statistics. In order to understand test results, assess risks, or choose a treatment option, medical professionals need statistical knowledge. In a study using a new quick test, researchers at the Harding Center for Risk Literacy at the Max Planck Institute for Human Development found that many medical students and professionals have inadequate knowledge of statistics. The Quick Risk Test and the study results have now been published in *BMJ Open.*

What does it mean to say that an HIV test has a sensitivity of 99.5 percent? Can a colonoscopy reduce one’s risk of dying from colorectal cancer? How much higher is the risk of a blood clot when taking birth control pills? Doctors have to select diagnostic options, interpret the results, and assess the benefits and risks of treatment options on a daily basis. In modern medicine, these decisions should be made on the basis of current scientific knowledge, namely on studies and statistics. To provide good and effective health care, medical professionals therefore need to be able to read, interpret, and communicate statistics. Previous studies, however, have shown that this is not always the case.

To assess medical professionals’ statistical literacy, researchers at the Harding Center for Risk Literacy at the Max Planck Institute for Human Development designed a quick test. The test consists of ten multiple-choice questions testing the ability to evaluate risks and understand probabilities and familiarity with key concepts of medical statistics. “The questions are based on situations in clinical practice. In a good health care system, all medical professionals need to answer these questions correctly,” notes Mirjam Jenny, first author of the study and chief scientist at the Harding Center for Risk Literacy.

In reality the situation is different, as the observational study of 169 students and 16 teachers shows. The students were about to finish their studies at Charité Berlin, and the teachers were professors and experienced lecturers participating in a continuing education course at a German university. Their participation in the study was voluntary and anonymous. On average, only half of the students and three quarters of the teachers answered all questions correctly.

“This study shows that medical schools continue to neglect teaching statistics – that needs to change. If future doctors misunderstand statistics, then they will pass on false information to their patients,” says Gerd Gigerenzer, coauthor of the study and director of the Harding Center for Risk Literacy.

At the same time, the study showed that it is easy to close this gap in medical students’ statistical knowledge. After taking the test, the students took a course on statistics containing theoretical information and practical exercises. Subsequently, they took the Quick Risk Test again. This time they answered on average 90 percent of the questions correctly.

Niklas Keller, coauthor of the study, teaches medical students to interpret and communicate medical statistics. In his words: “We don’t have to live with inadequate statistical literacy. In as
little as 90 minutes of training, medical professionals' statistical literacy can be improved substantially."

Although the authors note that the study was conducted systematically in only two locations and the number of tested professors and lecturers was small, the results confirm current evidence on the lack of statistical literacy. The new Quick Risk Test provides researchers with a tool to assess medical students’, practitioners’, and teachers’ statistical knowledge.

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**Quick Risk Test**

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