established research centres, familiarity with today's lingua franca (English), and scientific and individual traditions. Biotechnology requires money, which was and remains scarce in transitional countries.

The succession of Roman, Byzantine, French, Austro-Hungarian, and Russian cultural traditions in these countries also had negative consequences, particularly on free development and autonomy of education and science. In addition, communism, which combined a scientific view of the world with monolithic coercive power and strict social control, helped create intolerance to scientific creativity. Meanwhile, the dominance of the science-centred West, particularly after the second world war, stimulated cultural change of profound importance. Scientists who emerged in the United States, Canada, and the United Kingdom were regarded as having a public mission and a legitimate claim to political influence.³ They participated in creating "knowledge societies," in which expert-run systems are incorporated into all parts of social life.

To address this North-South, West-East divide, I suggest that both sides work hard: teach English to improve scientific communication, explore funding possibilities that the European Union might provide, provide computer technology, encourage young people (who have proved their interest in science) to

To bridge the gaps in scientific output

Improve sharing of scientific programmes

Enhance communication and run multinational projects

Encourage academic freedom and autonomy of science

Promote scientific communities worldwide in order to build creative, potent knowledge cultures that will bridge geographical and political boundaries

apply for scholarships and gain experience in the developed world. It worked for Western Europe after the second world war, and it should work for transitional countries today. The role of power in the social structure of science clearly has had an effect on its distribution worldwide. Perhaps the time has come not only to declare obvious research inequalities but to rethink our strategies and use power to bridge the gaps.

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Survey of attitudes and knowledge about science in medical students in southeast Europe

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For the countries of southeast Europe, joining the European Union would mean a fundamental reassessment of beliefs, attitudes, values, and structures developed during 50 years of communist regimes.¹ This would include their healthcare systems and the training of their healthcare professionals. Medical schools in southeast Europe will need to restructure medical curriculums within the unified Europe.² Medical students will have to learn modern evidence based medicine,³ for which they have not been prepared, mainly because of weak research output of their countries and inadequate education in research methods.⁴ To assess medical students' knowledge about research methods and communication and their attitudes towards research in medicine we used a specially constructed and validated questionnaire⁵ in medical schools in five post-communist countries.

Participants, methods, and results

In total 4307 students (66% response rate) answered a voluntary and anonymous questionnaire. The questionnaire contained a 45 item Likert-type scale developed to measure attitudes towards science,

grouped in three subscales, and an eight item knowledge test of principles of scientific research.⁵ The study was performed simultaneously at all schools, and students in all six years of their studies who were present at lectures could take part in the study.

Students generally had poor knowledge of research methods (mean of three correct answers out of a maximum of eight), with Albanian students scoring significantly lower than all other students (table). Students from Chisinau in Moldova and Mostar in Bosnia and Herzegovina performed significantly better than other students but showed opposite trends according to year of study. In Chisinau the knowledge score increased from 36% (95% confidence interval 34% to 38%) of correct answers for first year students to 45% (43% to 47%) for sixth year students, whereas students at Mostar had the best knowledge scores in the first year (73%, 70% to 76%, correct answers) but only 22% (14% to 32%) at the end of medical studies.

Despite poor knowledge scores, students had generally positive attitudes towards science, the highest

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Characteristics of the medical schools and countries in the survey can be found on bmj.com

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Students' attitudes towards science and knowledge about research methods in medical schools from five post-communist European countries. Figures are percentages of maximum score* with 95% confidence intervals

School†	Total scale (range 45-225)	Value of science			Knowledge test (range 0-8)
		For medicine (range 17-85)	Methods (range 12-60)	For society (range 16-80)	
Tirana, Albania (n=849)	60.6 (60.2 to 60.9)	64.7 (64.2 to 65.2)	60.4 (59.9 to 60.9)	54.7 (54.2 to 55.2)	18.7 (17.9 to 19.6)
Mostar, Bosnia and Herzegovina (n=138)	62.2 (61.1 to 63.3)	64.7 (63.5 to 66.0)	62.5 (61.2 to 63.7)	59.4 (57.9 to 60.9)	41.2 (36.8 to 45.7)
Osijek, Croatia (n=257)	61.7 (61.0 to 62.3)	64.7 (63.9 to 65.5)	62.5 (61.6 to 63.4)	57.8 (56.9 to 58.7)	35.0 (32.8 to 37.1)
Chisinau, Moldova (n=2057)	60.6 (60.3 to 60.8)	63.2 (62.5 to 64.0)	62.5 (62.2 to 62.8)	57.8 (57.5 to 58.1)	38.7 (37.9 to 39.6)
Kragujevac, Serbia and Montenegro (n=542)	63.3 (62.8 to 63.9)	64.71 (64.1 to 65.3)	64.6 (63.8 to 65.3)	60.9 (60.3 to 61.6)	26.2 (24.9 to 27.6)

*To allow for comparisons among schools. Possible score ranges are shown for individual scales. Scores on total attitude scale and its subscales and scores on knowledge test significantly differed among the countries (analysis of variance, all P values <0.01).

†Numbers in brackets indicate greatest number of valid responses (questionnaires with no missing answers); response rate among individual subscales was 85-99%.

scores were at Kragujevac (table). The greatest differences among the schools were for the subscale measuring the value of science for society, with the students from Albania having significantly lower scores than all others (table). Multiple regression analysis showed that female sex ($\beta=2.15$, 0.91 to 3.61, $P=0.002$), higher average grade ($\beta=0.68$, 0.01 to 1.33, $P=0.04$), and higher year of training ($\beta=0.53$, 0.12 to 0.95, $P=0.01$) all positively predicted total score on the attitude scale.

Comment

Although limited by the survey methods and differences in the size and curriculums of medical schools, our results show that medical students from five post-communist countries have positive attitudes towards science despite rather poor knowledge of research methods and scientific communication. This should be considered during the integration of these countries into scientific and medical programmes of the European Union. Increases in knowledge of scientific methods and critical thinking may reinforce attitudes towards science and help these countries to

embrace evidence based medicine. The knowledge of research methods differed significantly between the schools and according to the year of study, indicating that each country and school may need an individual approach.

We believe that targeting medical students may be a good way to start building up the critical mass of academic physicians with skills for understanding, performing, and communicating biomedical research and for critical thinking and appraisal of medical evidence. Most importantly, teaching principles of scientific research and evidence based medicine and fostering a positive attitude towards them among medical students can contribute to strengthening integrity in the academic environment and society as a whole. In societies with high levels of corruption, not only in the economy but in all other aspects of life, including academic medicine,¹ this is perhaps the most important goal for the European Union.

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Contributors: AM and MM conceived and designed the study. GB, MC, ER, VI, SJ, TMK, ON, VS, and VŠ conducted the survey in their schools and collected the data. GB analysed the data and interpreted them with AM and MM. AM wrote the draft of the paper and all other authors critically revised the paper for important intellectual content and approved the final version. MM is the guarantor of the study.

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What is already known on this topic

During almost 50 years of communist regimes, specific sets of values, beliefs, attitudes, and behaviour have developed in southeast European countries, which are also reflected in medical education and practice

Medical students in these countries need programmes for increasing their research capacities, knowledge of evidence based medicine, and scientific communication to join the global medical community

What this study adds

Medical students from post-communist countries have positive attitudes towards science and scientific research, despite their rather poor knowledge of research methods and scientific communication

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