SCIENTIFIC EDUCATION AND PUBLISHING IN THE FIELD OF CLINICAL CHEMISTRY

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Editor-in-chief Clin Chim Acta

Being the European editor-in-chief of CCA since 2003….

Some striking facts:

-only ± 25% of the papers are accepted

-often papers do not originate from clinical laboratories

-origin of papers is not evenly distributed

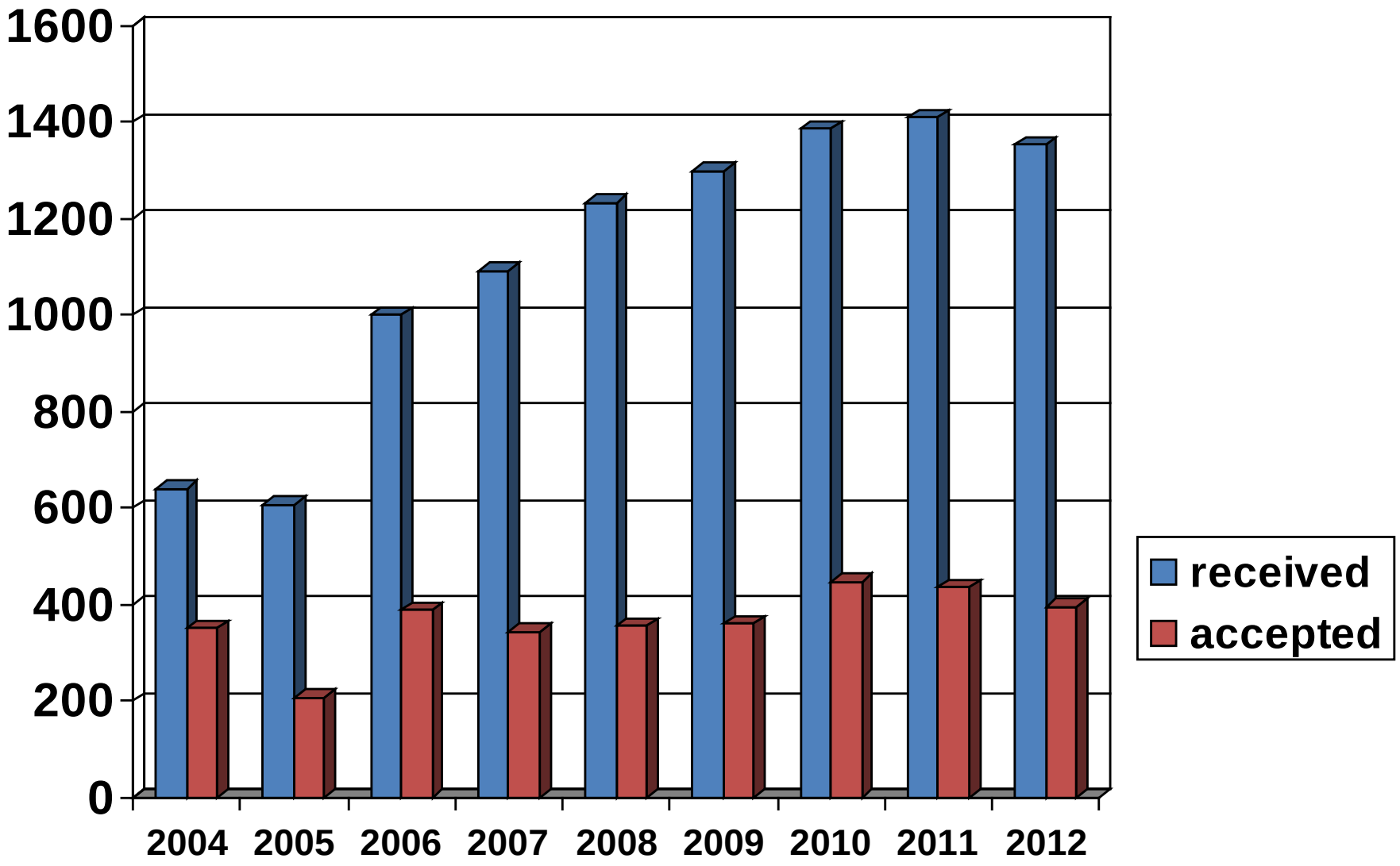
-REASONS???

Scientific publishing in the field of laboratory medicine has become very competitive in the last decades

Emerging science producing countries: China; Brazil, India, South-Korea,….

The relative importance of European publications has decreased over the years.

When carefully analysing the database of European manuscripts submitted in 2014 to Clinica Chima Acta (2013 impactfactor: 2.764), succesfull publishing depends on numerous factors.


1600
1400
1200
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2004
2005
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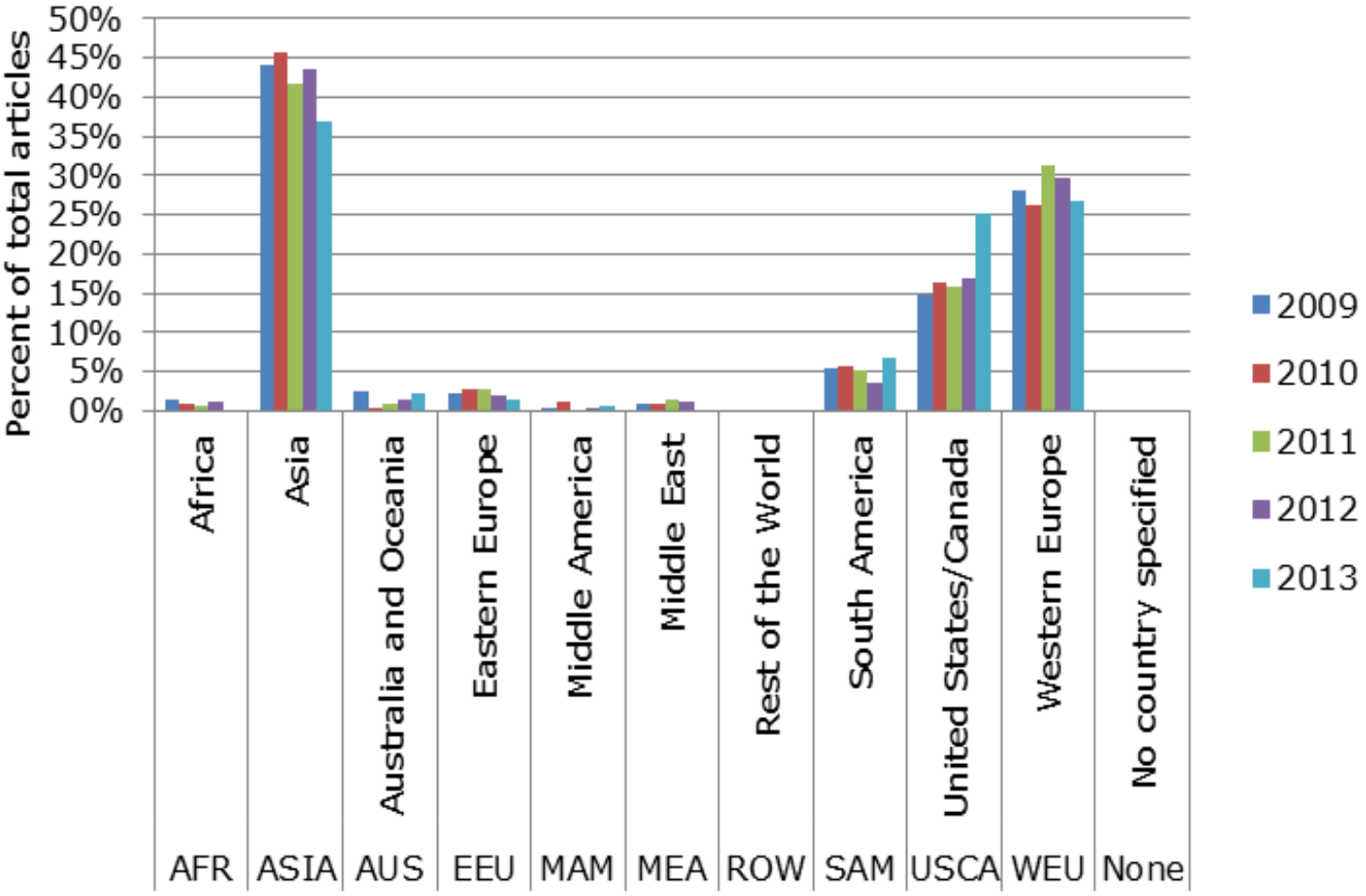
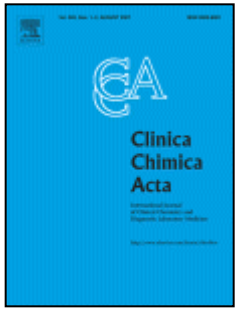
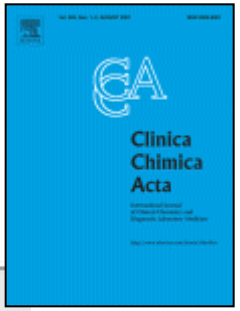
2008
2009
2010
2011
2012
received
accepted

2008-13 Accepted Papers by Region





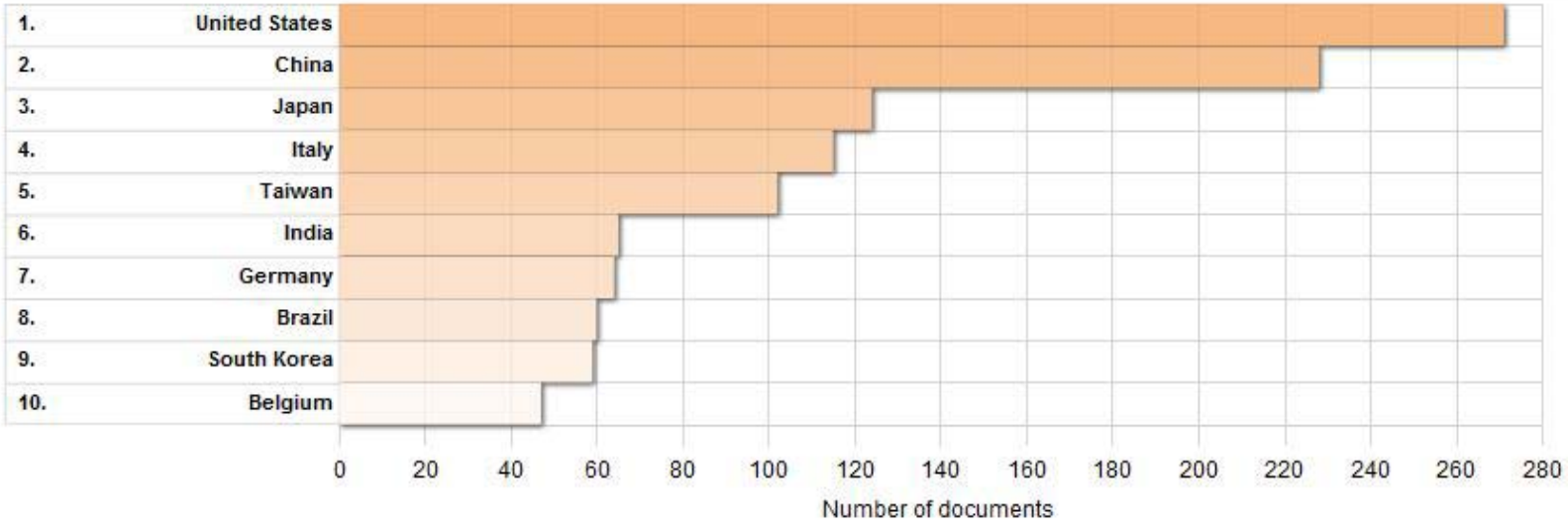
SCOPUS analysis 2010-2013 - country



Date range 2010 to 2013 Analyze Document results 1,477

Year | Source title | Author name | Affiliation name | Country | Document type | Subject area

Country This chart shows the total number of documents for this query by Country.



Research questions:

What are the determinants of clinical laboratory medicine - related scientific output in Europe?

GDP per capita?
Health care expenditure?
Cultural /geographical differences? (e.g. Persian Gulf countries have a high GDP and a low output)

EVOLUTION OF IMPACT FACTORS IN THE FIELD

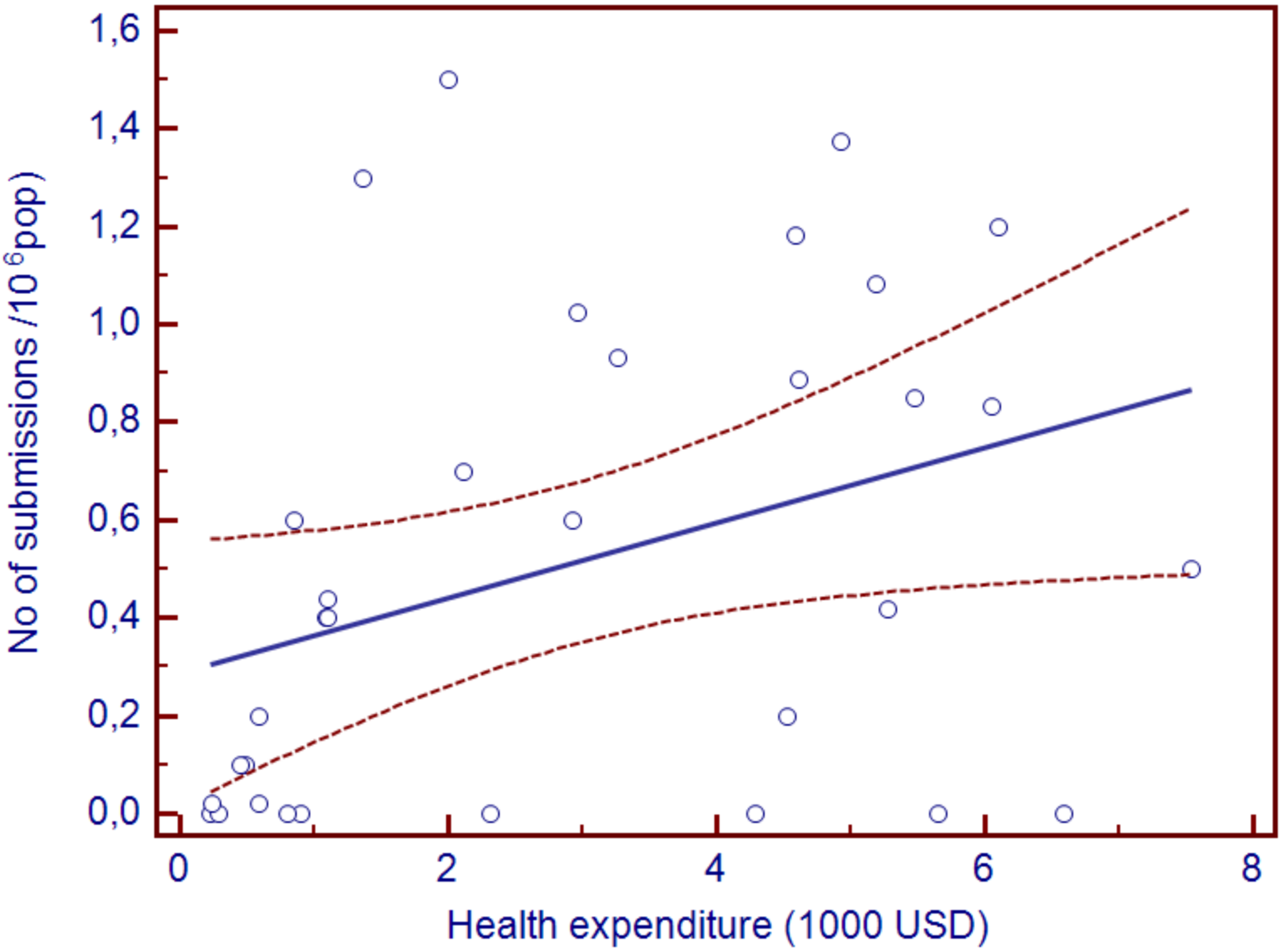
- Clin Chem Lab Med, Cclin Chim Acta, Ann Clin Biochem, Clin Biochem, … no major change

- So level of publication remains comparable over the last 5 -10 years

Limitations:

selection bias : we are NOT looking at the median, but at the higher percentiles of the distribution curve

geographical bias (e.g. UK)


No of submissions /10^6pop)
1,6
1,4
1,2
1,0
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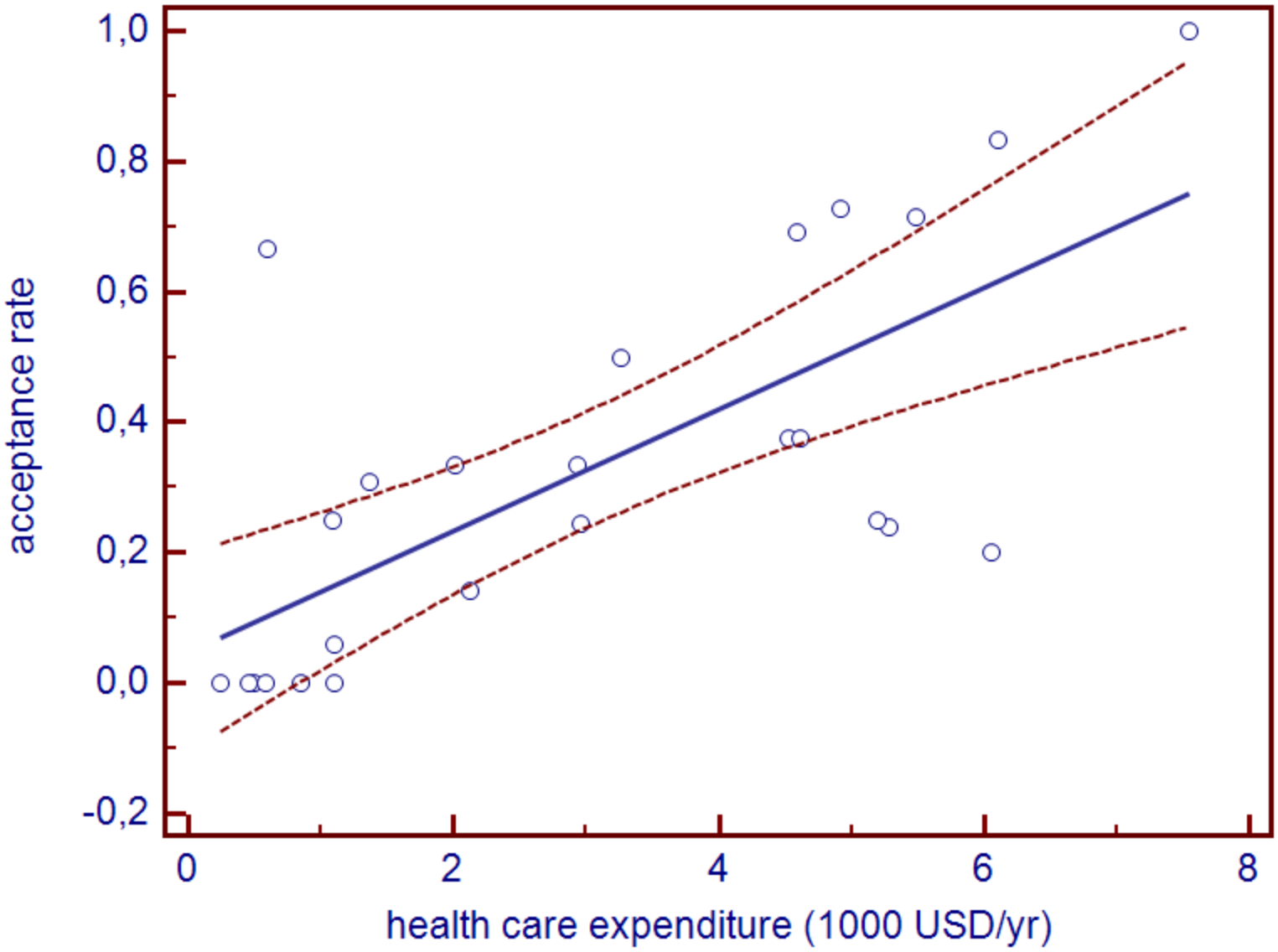
0,2
0,0
0
2
4
6
8
Health expenditure (1000 USD)


1,0
0,8
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acceptance rate
0
2
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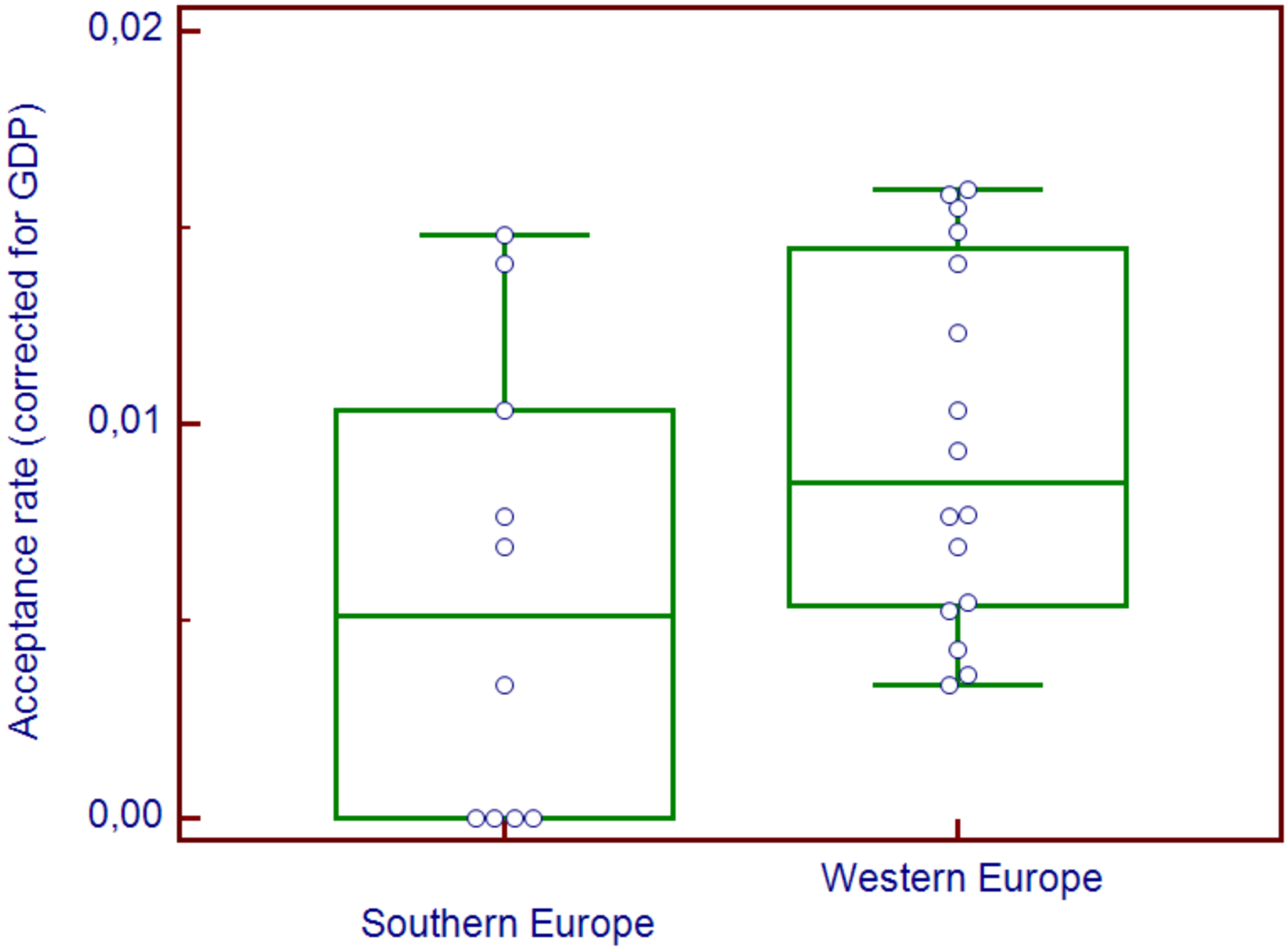
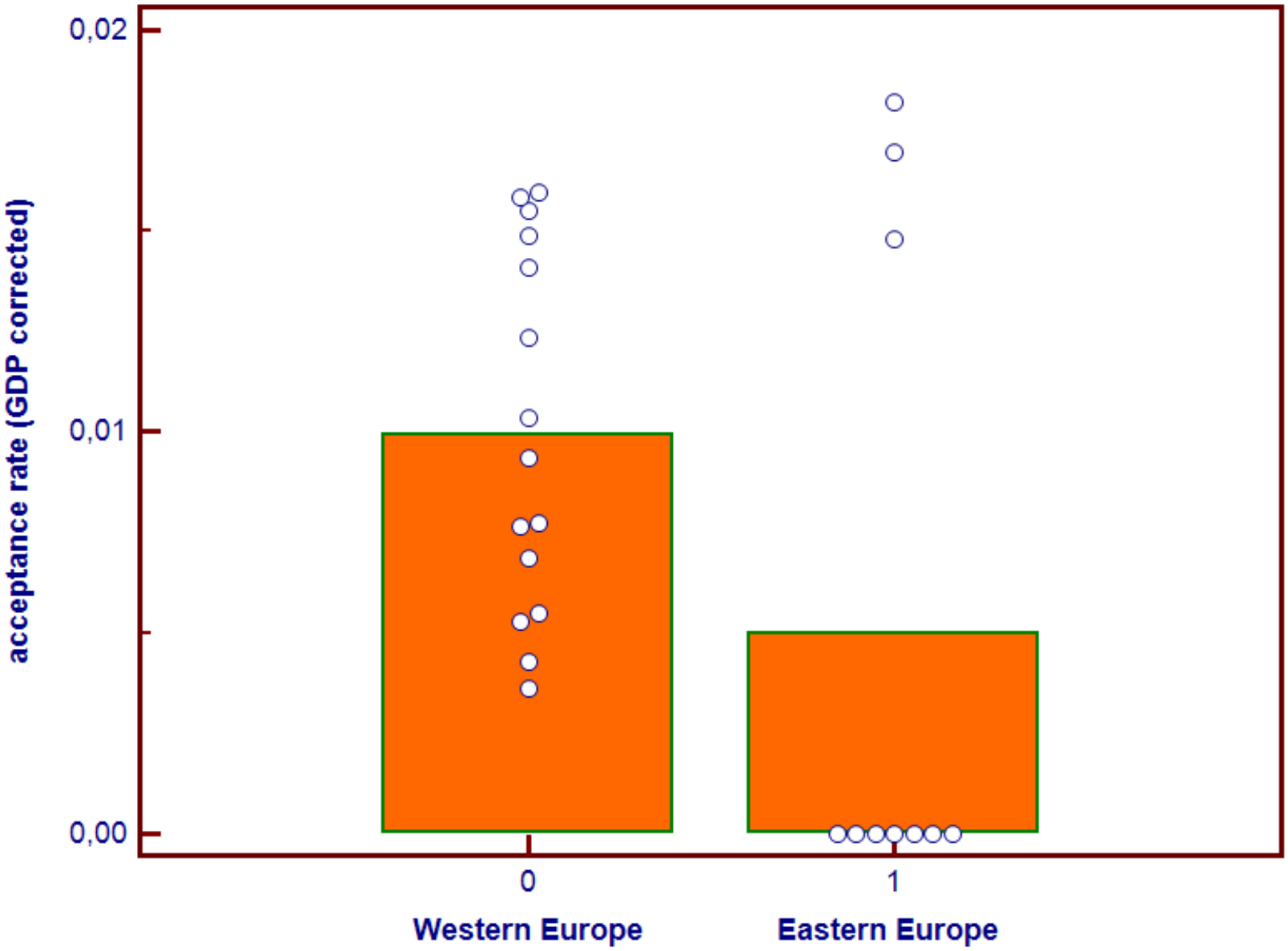
6
8
health care expenditure (1000 USD/yr)


0,02
0,01
0,00
Acceptance rate (corrected for GDP)
Southern Europe
Western Europe


0,02
0,01
0,00
acceptance rate (GDP corrected)
0
1
Western Europe
Eastern Europe

Both the scientific output (determination coefficient: 0.28) and the acceptance rate determination coefficient: 0.20). was correlated to the amount of money spent per capita to health care. Although it is quite clear that the gross domestric product per capita is an important determinant for a country's scientific output, other factors apparently play a role. Marked geographical and national differences can be noted among European countries.

Most commonly encountered flaws in manuscript submissions

1.Design flaws: statistically underpowered studies, unmatched controls

2. Confusion : accreditation report (validation studies of commercial products) is not equal to cutting edge science

3. Lack of innovation: e.g. is cholesterol a risk factor for cardiovascular disease in a particular country? (the opposite would be a more interesting research question!)

4. Poor depiction of data: handling experimental errors of measurement, no. of significant digits (e.g. a 7 -digits precision for a determination which has a CV of 5%), inappropriate statistical tests

5. Wrong methodology used

6. Outdated topics (e.g. vintage ‘70s science)

The environment is getting less science - minded

Undergraduate medical training puts less accent on basic sciences.

In the past decades, curriculum reforms with the primary aim of enhancing integration of the basic sciences with clinical medicine have been initiated in medical schools around the world. However, the process of integration varied greatly with significant differences in design structure, including: time allocation, sequencing, electives or compulsory courses, and pedagogy. (Spencer AL, Brosenitsch T, Levine AS (2008). Back to the Basic Sciences: An Innovative Approach to Teaching Senior Medical Students How Best To Integrate Basic Science and Clinical Medicine. Acad Med 83: 662-669.

Problem-based learning (PBL) following its first implementation by McMaster university medical school about 4 decades ago had a huge impact. More recently, several new approaches have been well documented, and these are likely to receive more attention and to be adopted and adapted by other medical schools. Gwee MCE (2009). Problem-Based Learning: A Strategic Learning System Design for the Education of Healthcare Professionals in the 21st Century. Kaohsiung J Med Sci, 25: 229-237.

Specialist training models in laboratory medicine greatly ignore these changes and do not take into account the reduced basic knowledge.
In this way, they contribute to a persistant knowledge gap.

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Gastroenterology. 2006 September ; 131(3): 697–698. doi:10.1053/j.gastro.2006.07.040.

The Future of Physician-Scientists–Demise or Opportunity?

Vincent W. Yang, MD, PhD [Co-Senior Associate Editor]

Physician-scientists are physicians who conduct biomedical research as their primary professional activity. Their research is often focused on the pathophysiologic mechanisms t elucidate strategies for diagnosis, prevention, and treatment of diseases. Some physician-scientists perform research that involves direct patient contact. Other physician-scientists perform bench research aimed at understanding the basic mechanisms of normal biologica processes. As a consequence of their work, physician-scientists significantly contribute to t advancement of medical knowledge and frequently find themselves making discoveries through translating exciting new findings from the laboratory to the practice of medicine. Su advances are extremely valuable not only in delivering patient care but in providing the foundation for evidenced-based medical training. Hence, many physician-scientists are valuable teachers to medical students and convey a deep appreciation for the importance o science in medicine. Finally, armed with the wealth of new information derived from the recently completed human genome project, physician-scientists are particularly suited to brid the knowledge gap between clinicians and basic scientists.

CONCLUSIONS

- Even after correcting for domestic product per capita and national health care expenditure, both manuscript acceptance rate and total number of scientific papers submitted to CCA appear to be generally lower in Eastern and Southern Europe.

- Apart from linguistic and technical barriers, these residual variation points to major cultural and educational differences within Europe.
- Higher than average acceptance rates were seen for Austria, Denmark, Germany, Italy, Sweden, the Netherlands, Belgium, and the Czech Republic.
- On the other hand, low success rates were observed for Polish and Turkish manuscript submissions.
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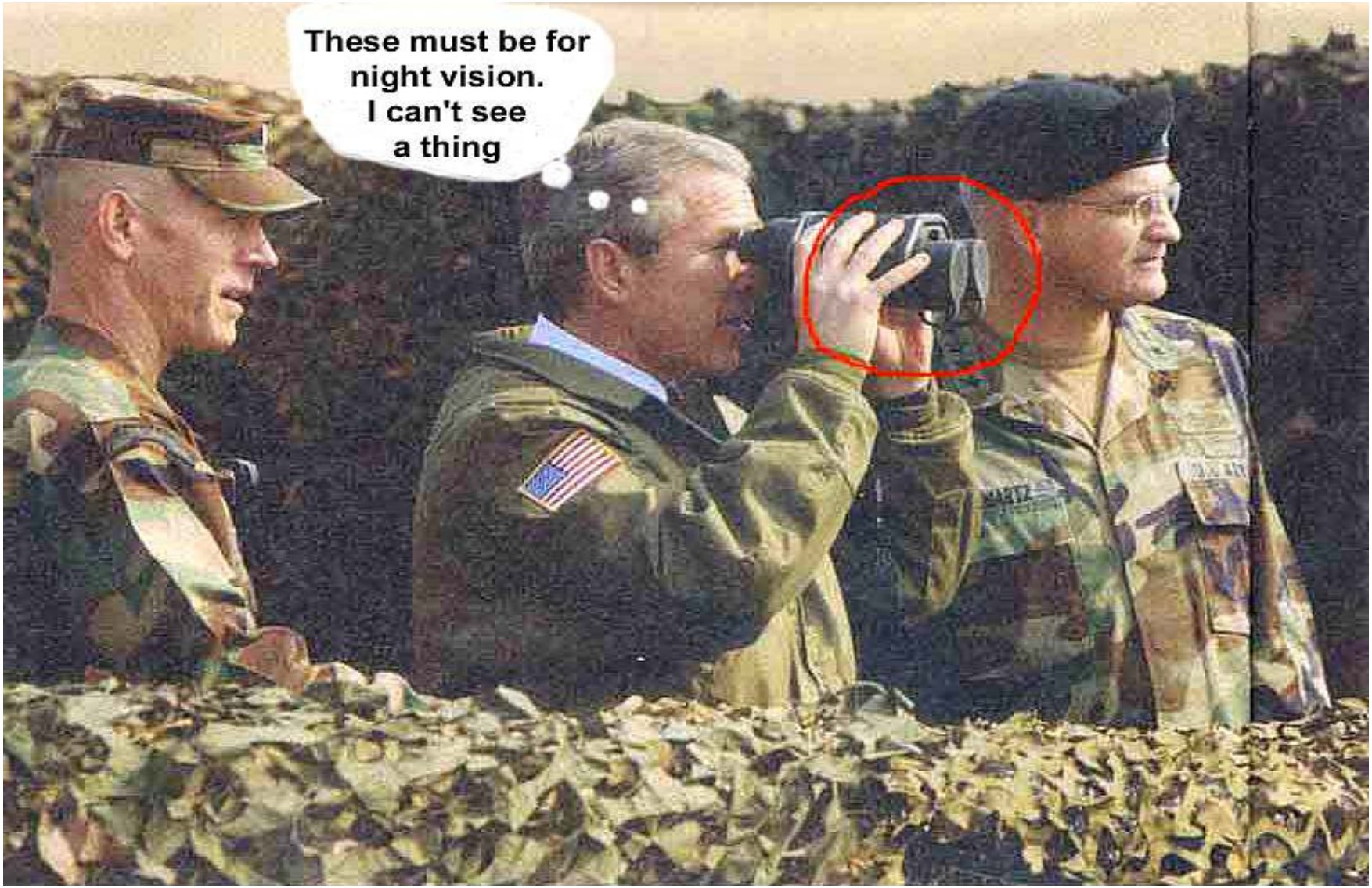
Your
Wake
Up
Call

LOOKING INTO THE FUTURE



SOLUTIONS

- These data suggest that corrective educational measures (e.g. basic scientific training, statistics, study design, scientific writing) will be necessary to lower the differences among various European regions.

JOINT EFFORT

- Universities: education
- Professional organisations active in the field of laboratory medicine: requirements
- Scientific societies: general framework