



**Asia-Pacific
Economic Cooperation**

2018/CSAE/009

Agenda Item: 6

Enhancing Public Understanding of Science to Ensure Innovation-Driven and Sustainable Development

Purpose: Information

Submitted by: China



**5th Chief Science Advisors and
Equivalents Meeting
Brisbane, Australia
25-26 October 2018**



5th Meeting of APEC Chief Science Advisors and Equivalents (CSAE)
Brisbane, Australia Oct 25-26, 2018

Enhancing public understanding of science to ensure innovation-driven and sustainable development

Xian-En Zhang 张先恩

Institute of Biophysics, Chinese Academy of Sciences, China

“Knowledge is power”

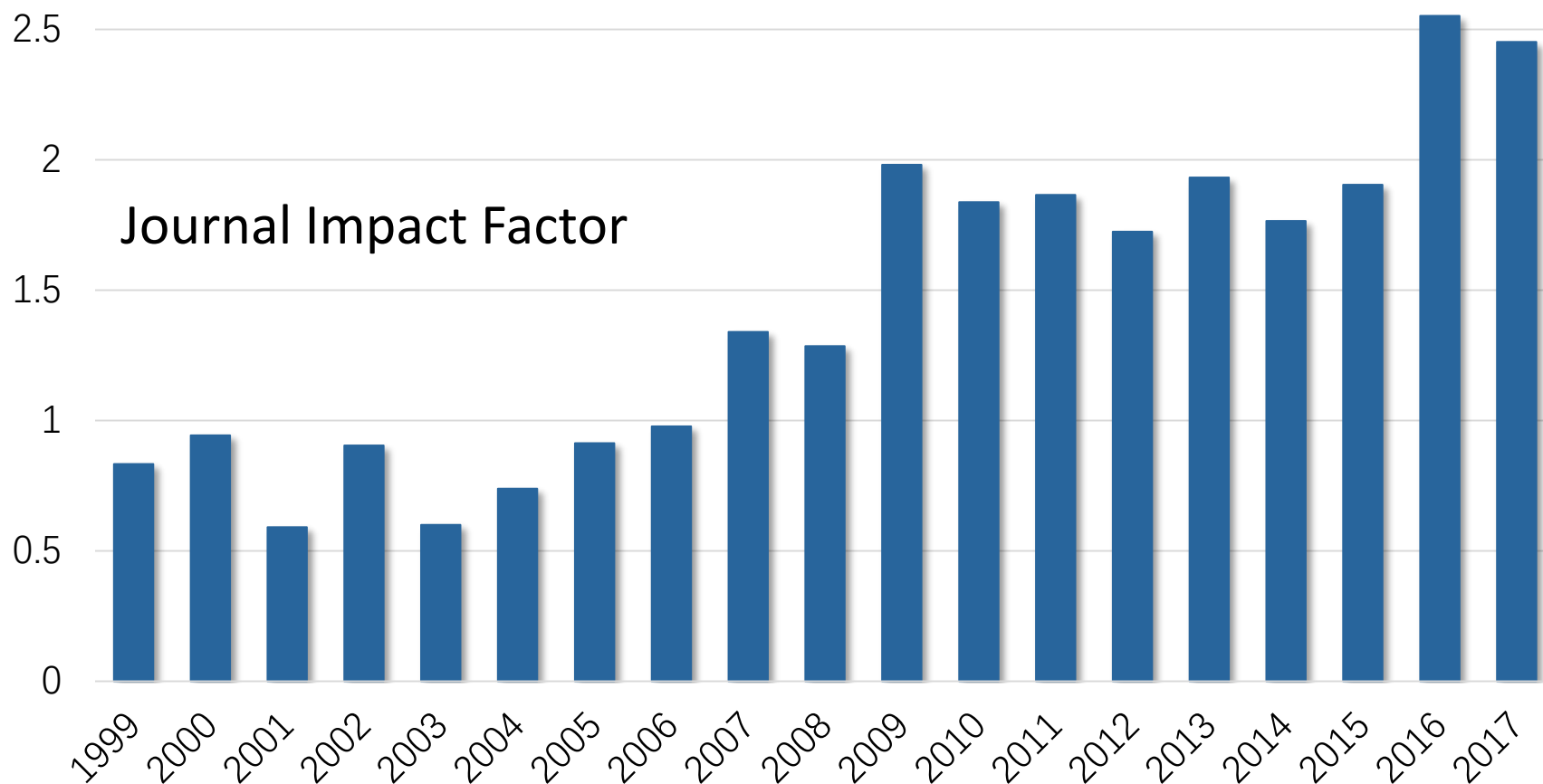
Sir Francis Bacon (1597)



“the power of knowledge depends not only on the value of its won, but also depends on whether it can be spread, as well as the depth and breadth of dissemination”

https://en.wikipedia.org/wiki/Scientia_potentia_est
https://en.wikipedia.org/wiki/Francis_Bacon#Science

3 "***Public Understanding of Science*** is an essential source for any scholar working in this field. Its international reach and its wide range of contributors make it even more valuable." Professor Jon D. Miller



**Public understanding of science –
a new indicator of comprehensive capability of an economy**

CERI provides and promotes international comparative research, innovation and key indicators, explores forward-looking and innovative approaches to education and learning, and facilitates bridges between educational research, innovation and policy development



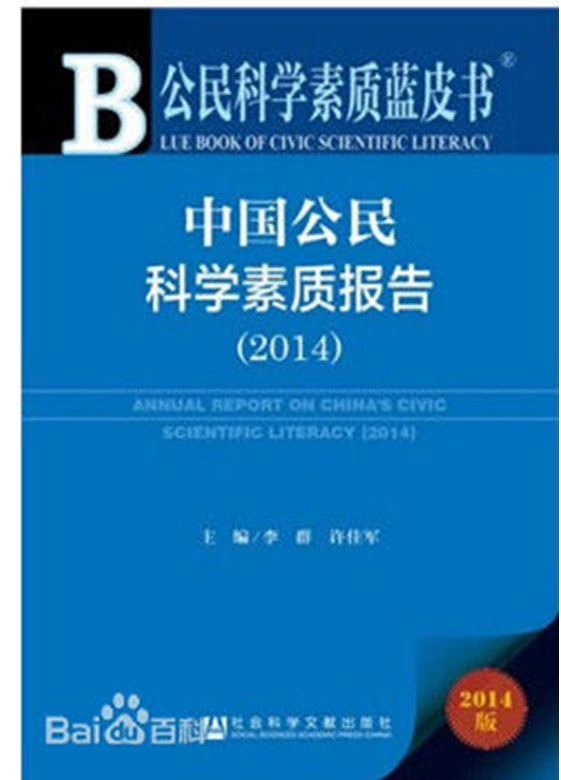
Jon D. Miller

University of Michigan | U-M · Institute for Social Research

29.30

The Measurement of Civic Scientific Literacy - Building on two decades of national surveys in the United States and two Eurobarometer studies, the history, rationale, and structure of a measure of civic scientific literacy are described.

Jon D Miller. Public Understanding of Science, 1998, 7(3):203-223



中国公民科学素质调查年报 Annual report on China's civic scientific literacy, edited by Li Qun et al. Social Sciences Academic Press (China). Editions of 2014, 2015-2016 and 2017-2018 (in Chinese).

Surveys on Public understanding of science

Science in the Public Mind: A Relation Approach to Scientific Credibility
Gordon Gauchat and Kenneth Andrews, Univ Wisconsin

Public Views of Science-Based Policy and Funding The Political Context of Science in the United States: Public acceptance of evidence-bas...
Social Forces, 2015. Gordon Gauchat

The Cultural-Cognitive Mapping of Scientific Professions, American Sociological Review 83(3):567-595 · June 2018. Gordon Gauchat, Univ. Wisconsin and Kenneth T. Andrews, Univ. North Carolina at Chapel Hill

Science to the People: A32-nation: Public Understanding of Science, 2018
Kirils Makarovs, Natl Res Univ. Russia and Tiburg Univ. Essex, UK
Peter Achterberg, Tubrug Univ. Netherland

A Systematic Initial Study of Civic Scientific Literacy in China: Cross-National Comparable Results from Scientific Cognition to Sustainable Literacy
Sheng Wu, Yi Zhang, Zheng-Yun Zhuang, Sustainability, 2018

The Political Context of Science in the United States: Public Acceptance of Evidence-Based Policy and Science Funding
Social Forces Advance Access, 26th Feb 2015
Gordon Gauchat, Univ Wisconsin

Surveys on China's civic science literacy (CSL)

Annual report on China's civic scientific literacy 中国公民科学素质调查年报 (蓝皮书), edited by Li Qun et al. Social Sciences Academic Press (China). Editions of 2014, 2015-2016 and 2017-2018 (in Chinese).

Sampling survey on Chinese citizen's science literacy 中国公民 CSL 抽样调查
China Association of Science & Technology (CAST 中国科协) Implementation office of
Outline of the National Scheme for Scientific Literacy China Research Institute for
Science Popularization

A Systematic Initial Study of Civic Scientific Literacy in China: Cross-National
Comparable Results from Scientific Cognition to Sustainable Literacy
Sheng Wu, Yi Zhang, Zheng-Yun Zhuang, *Sustainability*, 2018

Main findings from the survey of public understanding of science in China, 2018



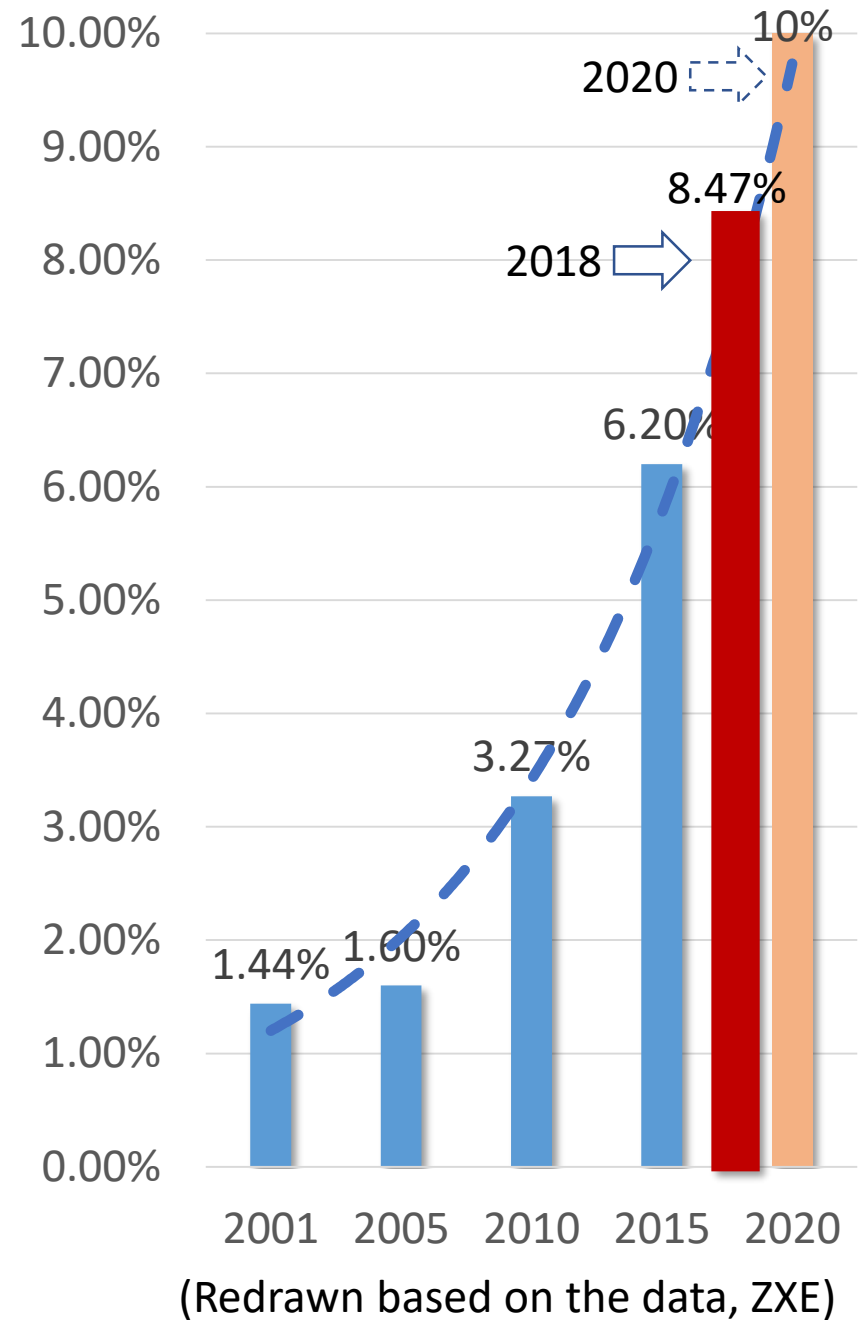
Implementation office of Outline of the National Scheme for Scientific Literacy China
Research Institute for Science Popularization

<http://www.wcsl.org.cn/uploadfile/2018/0922/20180922081340130.pdf>

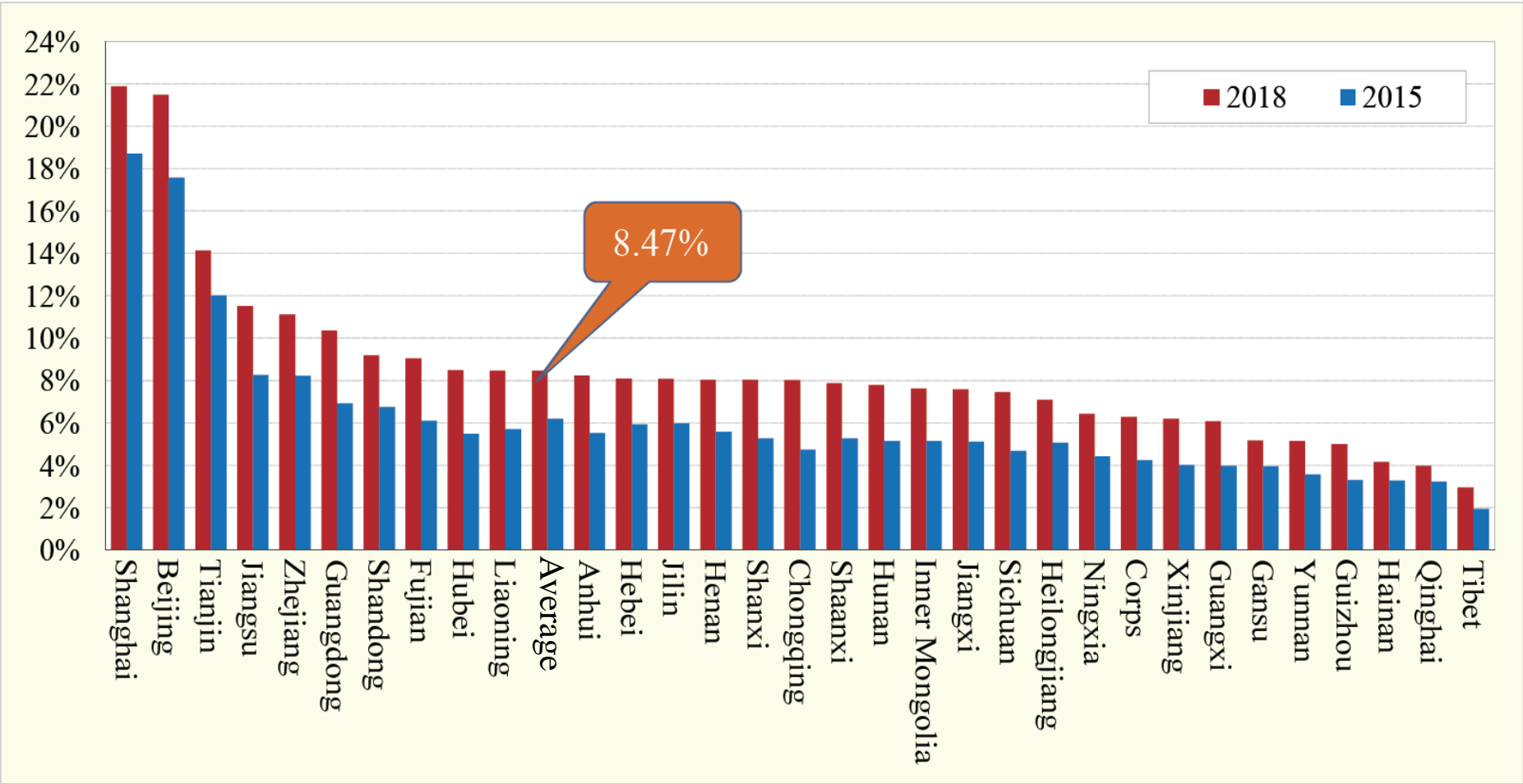
CSL level of Chinese citizens has shown exponential growth over the decade

Level of CSL Chinese citizens has improved significantly, with the proportion of the people qualified as scientifically literate reaching 8.47% in 2018, 2.17% higher than in 2015, laying a solid foundation for accomplishing the strategic goal of increasing the rate of CSL to 10% by 2020 (one of the goals of 13th 5-year STI Plan).

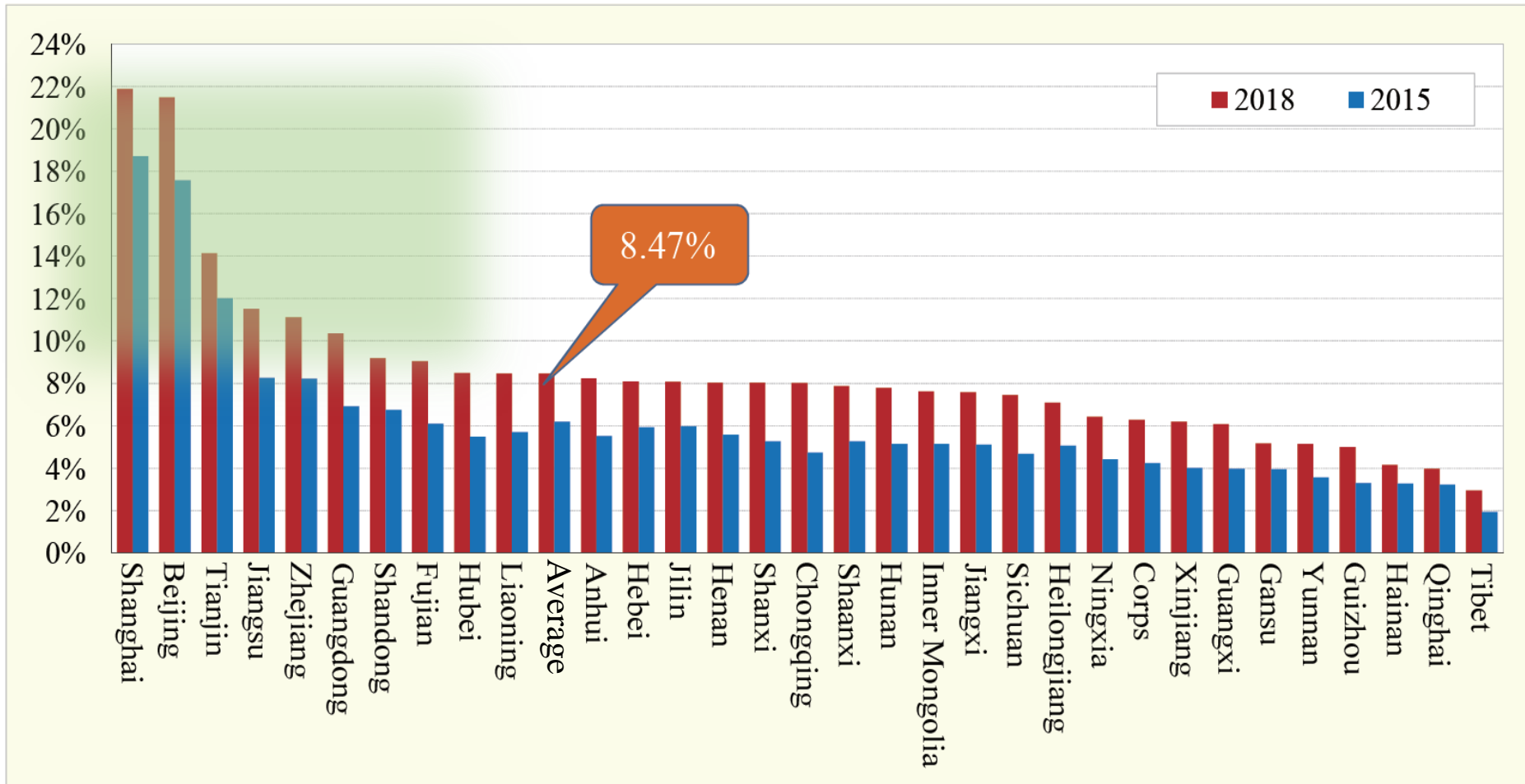
<http://www.wcsl.org.cn/uploadfile/2018/0922/20180922081340130.pdf>



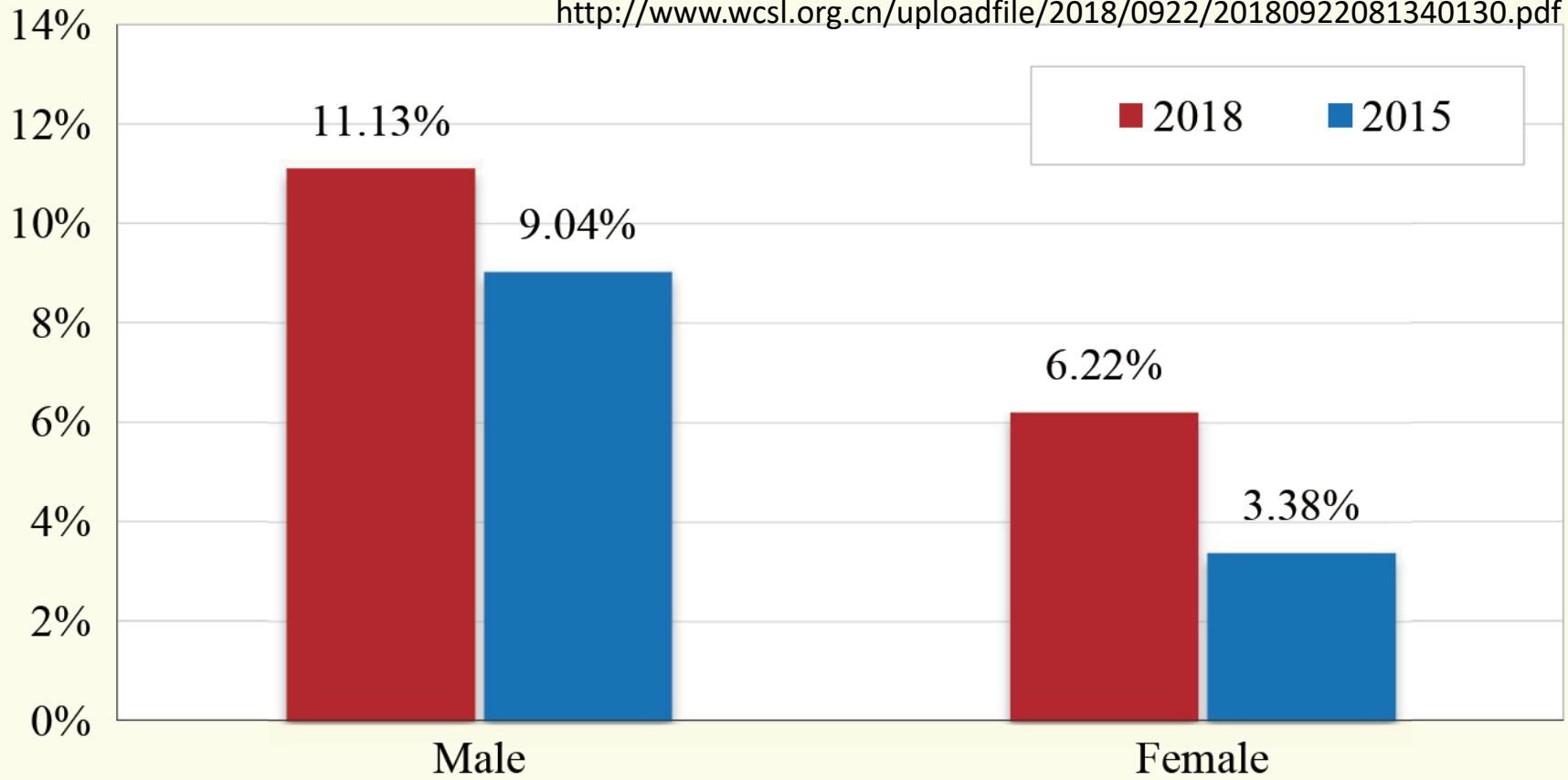
Level of CSL increased substantially in all regions



High correlation between the Level of CSL and regional development stage



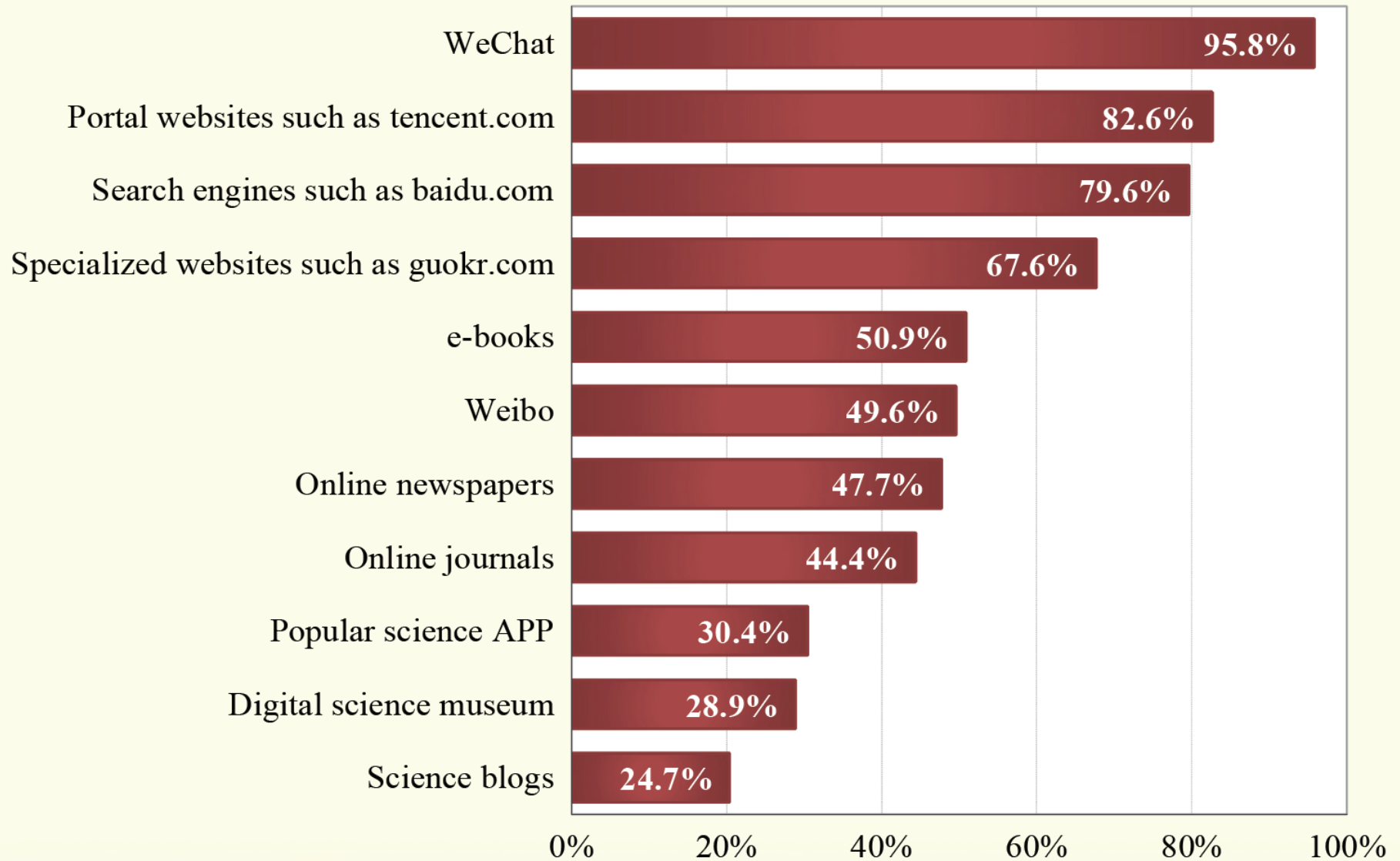
CSL is the highest in the East, decreasing gradually from the east to the West. Beijing-Tianjin-Tangshan, Yangtze River Delta and Pearl River Delta are the most economically developed areas in China, and their citizens' CSL enjoy the highest, while the CSL level of the west region remain low.



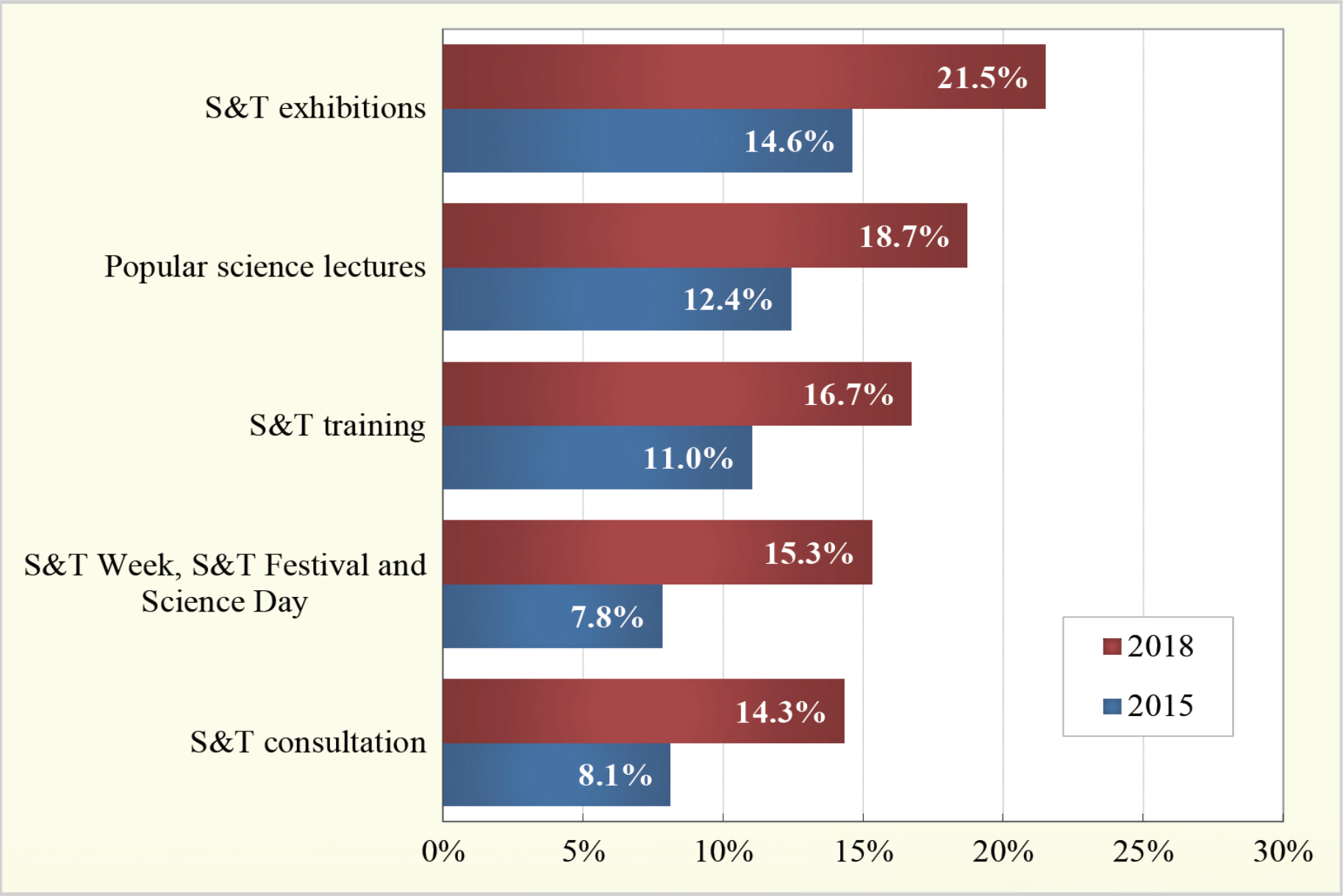
Change of CSL in Chinese citizens of different genders

Role of science communication in a digital age

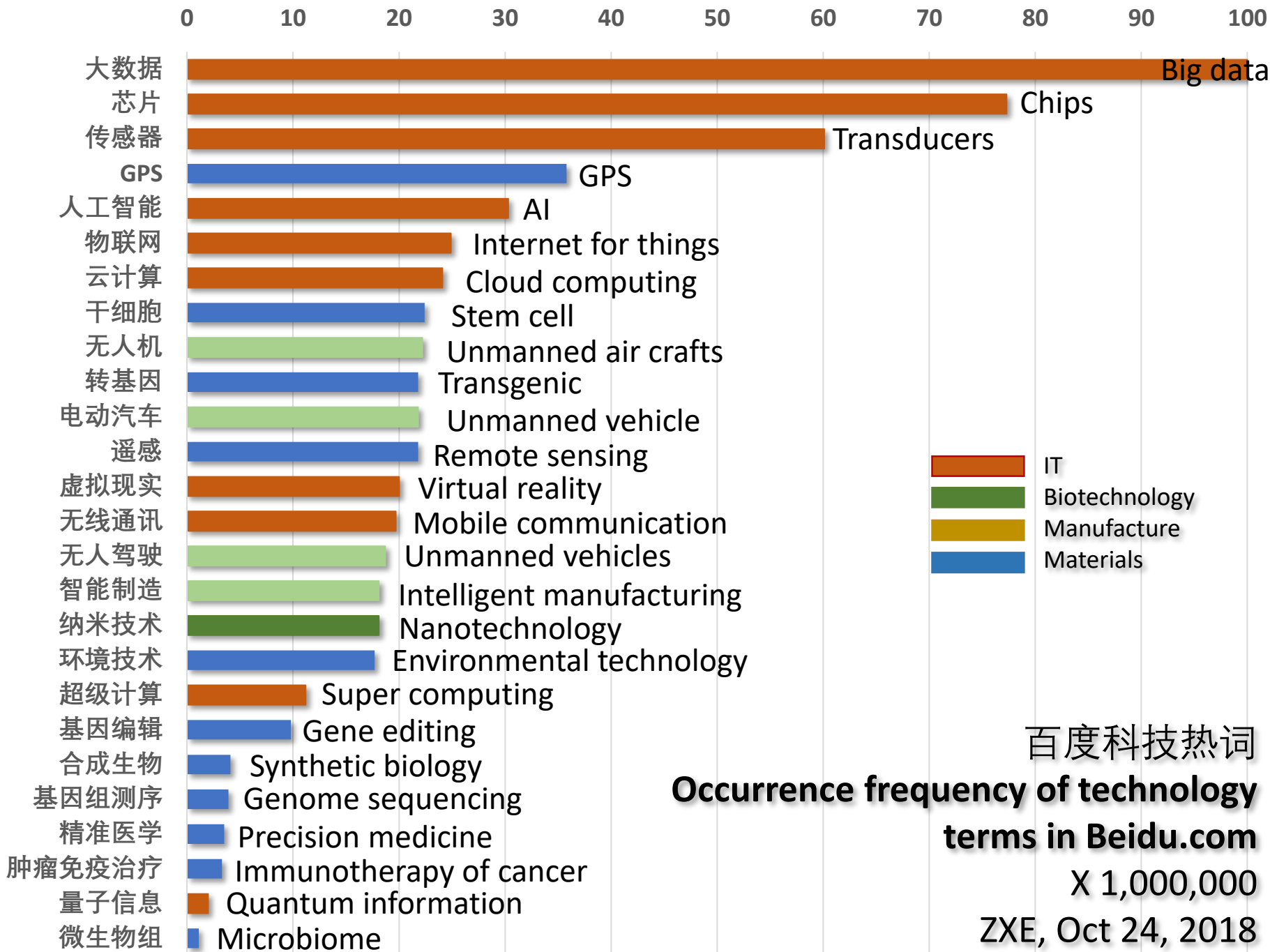
Mainstream Internet sources from which Internet users accessed S&T information



Participation of science popularization activities among Chinese citizens



Public interests in S&T



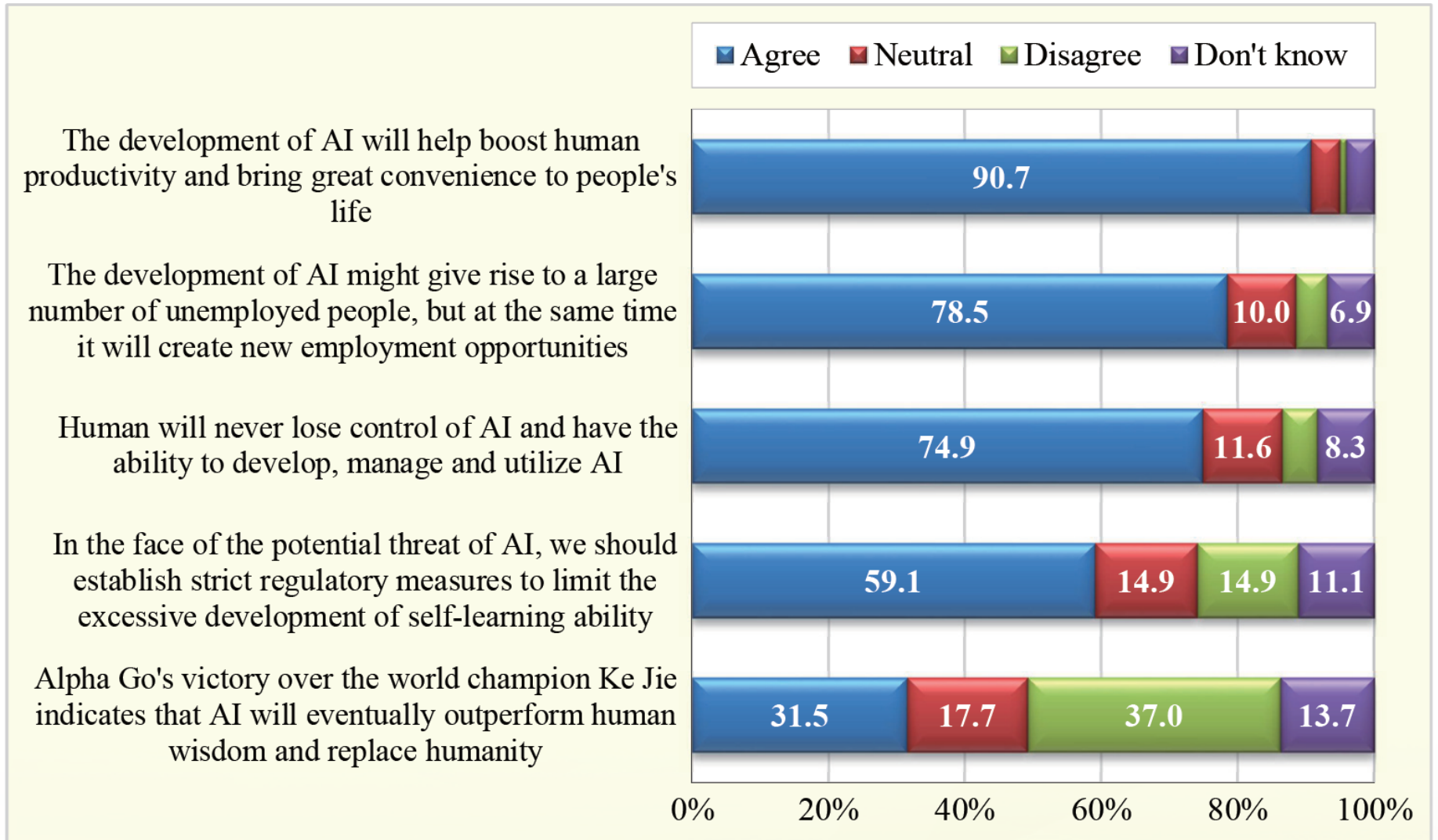
百度科技热词

Occurrence frequency of technology terms in Beidu.com

X 1,000,000

ZXE, Oct 24, 2018

Respondent's attitudes towards AI (2018)



Integrity in science communication

Massive information is mixed with low quality and pseudo/false science information

[假科学遍地,你能分辨哪些是营销骗局吗?_搜狐科技_搜狐网](#)



2017年9月19日 - 太空里看不到长城,仙人掌只负责好看不吸收辐射开水煮N遍也不会毒死谁,孕妇防护服压根就是营销骗局。我们...

www.sohu.com/a/1929357... - 百度快照

[朋友圈假消息,正在毁掉中国父母 -ZAKER新闻](#)

6天前 - 本文选自中信书院阅读时差栏目。阅读时差动态实时同步全球前沿新知,为你打破知识的国界。本期阅读时差为你分享的这本书是《错误信息时代的幸存指南》...

www.myzaker.com/articl... - 百度快照

[科学网—网上假新闻比真消息传播快 - 刘进平的博文](#)

2018年3月10日 - 网上假新闻比真消息传播快,这全因为人性的弱点。事实证明,人们通常更喜欢新奇的虚构消息,而不是严肃的事实真相。Scientists verify that fake news...

blog.sciencenet.cn/ho... - 百度快照

[全球40万研究人员在虚假科学期刊上发表文章—新闻—科学网](#)

2018年7月23日 - 德国多家媒体日前披露,一些出版商采用欺骗手段,经常在虚假科学期刊上刊登...大量真真假假甚至错误的信息流传到社会,甚至渗透到公众辩论中误导舆论。...

news.sciencenet.cn/htm... - 百度快照

[\[转载\]人们更偏爱假消息?《科学》发文探讨假消息的科学](#)

2018年3月13日 - 人们更偏爱假消息?《科学》发文探讨假消息的科学 麻省理工学院(MIT)在2018年3月9日的《科学》(Science)期刊上发表题为《网络真假消息的传播》...

blog.sciencenet.cn/blo... - 百度快照

[假新闻也有大科学,真相几乎“没鞋穿”!-腾讯网](#)



2018年3月11日 - 假新闻也有大科学,真相几乎“没鞋穿”!2018...的指控,新闻头条中充斥着各种病毒式传播的可疑信息。...

<https://new.qq.com/omn/2018031...> - 百度快照

Fake science, can you tell?

Survival guide in the age of error information

Science Web: false news online is faster than truth.

400,000 researchers in the world publish articles in fake scientific journal (Sueddeutsche Zeitung, July 23, 2018)

Science papers: People are more partial to false information?

Stop the False news is a big science?



Cell paper (Oct 1980) : Dietary fiber intake may induce liver cancer

Hi, man, the study only refers to inulin, the message is confusing and frightened the public by the use of the term “dietary fiber”.

“Dysregulated microbial fermentation of soluble fiber induces cholestatic liver cancer”. The title of the message confuses and frightens the public, because dietary fibers, including soluble and insoluble, many kinds, widely exist daily foods. If the title of the paper clearly defined the experimental materials, it should very good, otherwise causes public scare. So, the scientists must be responsible for transmitting integrated knowledge.

Well, thanks Xian-En for explaining this to me. I first heard about inulin.

Study: False news 70 percent more likely to spread on Twitter

Scientists verify that fake news outruns truth on Twitter — and call for a fix

<http://blog.sciencenet.cn/home.php?mod=space&uid=39731&do=blog&id=1103248>

Science papers, 09 Mar 2018: 359(6380)

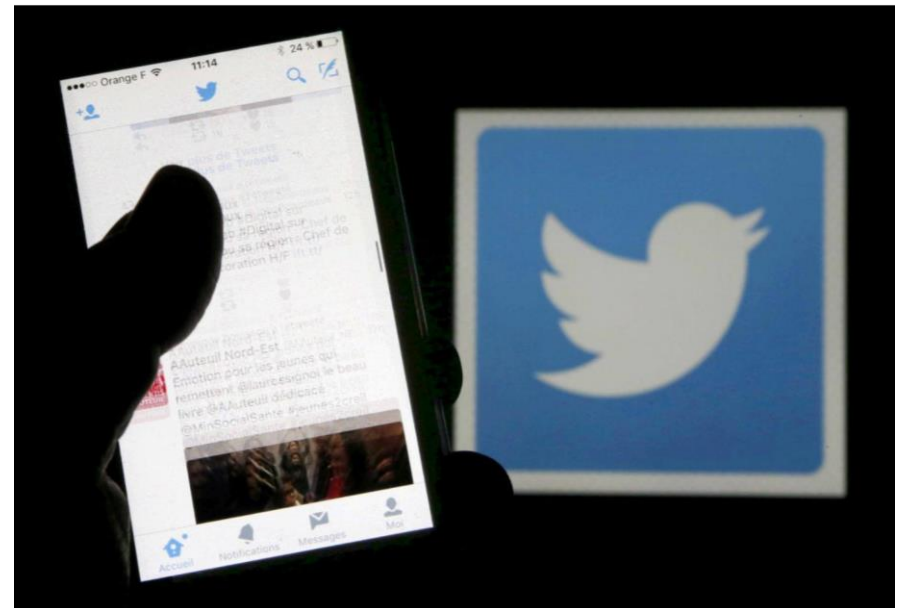
- The spread of true and false news online
- The science of fake news

Automatic robots (which automatically simulate human accounts) can magnify the order of magnitude of fake news dissemination by ordering, sharing, and searching for information.

False news travels farther, faster, deeper and wider than true news. False news is generally more novel than true news, indicating that people prefer to share new news. False news provokes fear, nausea, and surprise, while true news provokes expectation, sadness, joy, and trust.

<http://blog.sciencenet.cn/blog-951291-1104246.html>

<https://www.reuters.com/article/us-usa-cyber-twitter/false-news-70-percent-more-likely-to-spread-on-twitter-study-idUSKCN1GK2QQ>



WeChat anti-rumor center

To this end, the WeChat public platform has set up a **WeChat anti-rumor center**. The center jointly dispelled rumors by introducing more than 800 third-party authoritative agencies, including 289 agencies of former National Food and Drug Administration System, 5 state-level media, and 32 online correspondence accounts in China. In 2017, the Wechat Anti-rumor Center punished about 180,000 Wechat public addresses, and transmitted about 490 million of popular science messages, an average of about 1.4 million times a day

Tencent science and technology news, "2018 WeChat rumors management report". March 2nd, 2018, <http://tech.qq.com/a/20180302/033437.htm>

World Congress on Public Understanding of Science



2018 WORLD CONFERENCE ON SCIENCE LITERACY

September 17-19, 2018 Beijing, China, China National Convention Center

Promoting Public Science Literacy
Building a Community with a Shared Future for Mankind



[Home](#) | [Programs](#) | [Media Center](#) | [Global Vision](#) | [Science Popularization](#) | [Achievements](#) | [About WCSL](#)



SCIENCE LITERACY AND SUSTAINABLE DEVELOPMENT



Building a Community with a Shared Future for Mankind

http://www.wcsl.org.cn/index.php%3Fm%3Dcontent%26c%3Dindex%26a%3Den_index

.... with the theme "Science Literacy for a Shared and Better Future" and the UN Sustainable Development Goals (SDGs*). The conference was participated by 23 international organizations, 60 organizations and agencies, and over 1000 participants from various regions. The participants fully exchanged their views, reached the consensus,

Beijing Declaration on world public scientific literacy

promoting positive interactions between society and S&T in their broadest sense, understanding our mission and responsibilities, working together to narrow the gap in science literacy, persistently promoting universal benefit and fairness, and building a mechanism for collaboration and exchanges. The declaration promised to actively promote the upgrading of VSL to the UN's sustainable development agenda.

http://www.wcsl.org.cn/index.php?m=content&c=index&a=en_index





Suggestions to CSAE

- conduct a survey on public science literacy in APEC region. The findings will be provided as reference to all member economies. The survey could be carried out by the working group of Policy Partnership on Science, Technology & Innovation (PPSTI).
- promote application of advanced IT technology in the popularization of science by supporting the cooperation between information network enterprises and the scientific community. This could be carried out cooperatively across the APEC's working groups, for example, PPSTI and Telecommunication and Information (TI).

Thanks