Putting Assessing Impact for Science into Context

ELLEN HAZELKORN
BH ASSOCIATES & TECHNOLOGICAL UNIVERSITY DUBLIN
ASSESSING IMPACT OF SCIENCE: METHODS & INSTRUMENTS
AESIS, 3 NOVEMBER 2021

Themes

- Changing higher education landscape
- Accountability and Impact Agenda
- Policy developments & instruments

Changing higher education landscape

Massification, Globalisation & Internationalisation

Combination of demographic growth, economic and labour market changes, globalisation and internationalisation have pushed up demand for higher education participation, and for graduates.

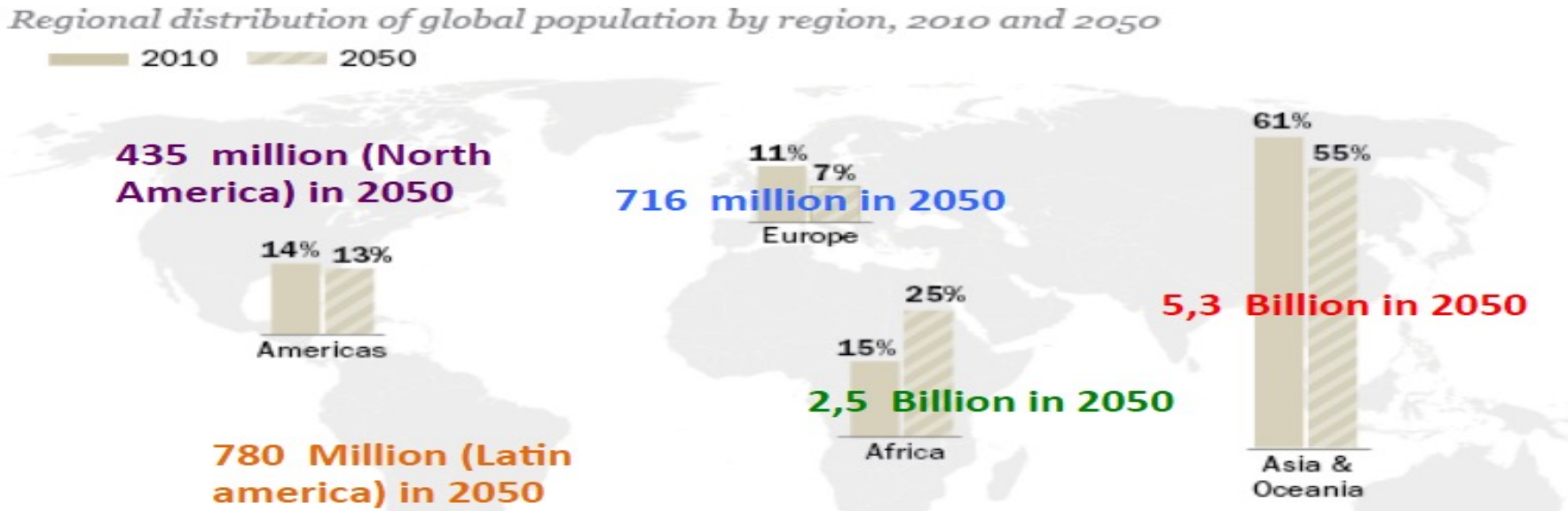
—Everywhere, (higher) education systems have been transformed, spurred by the recognition that education is key to driving sustainable social and economic growth, empowering personal satisfaction and success, and improving societal outcomes.

—International data showing continuing expansion and growing diversity amongst students and providers is wide spread internationally.

—Significant political will to continue to expand HE systems, using combination of public and private providers.

Population Expansion 2010-2050

8.6 billion in 2030, and to increase further to 9.8 billion in 2050 and 11.2 billion by 2100

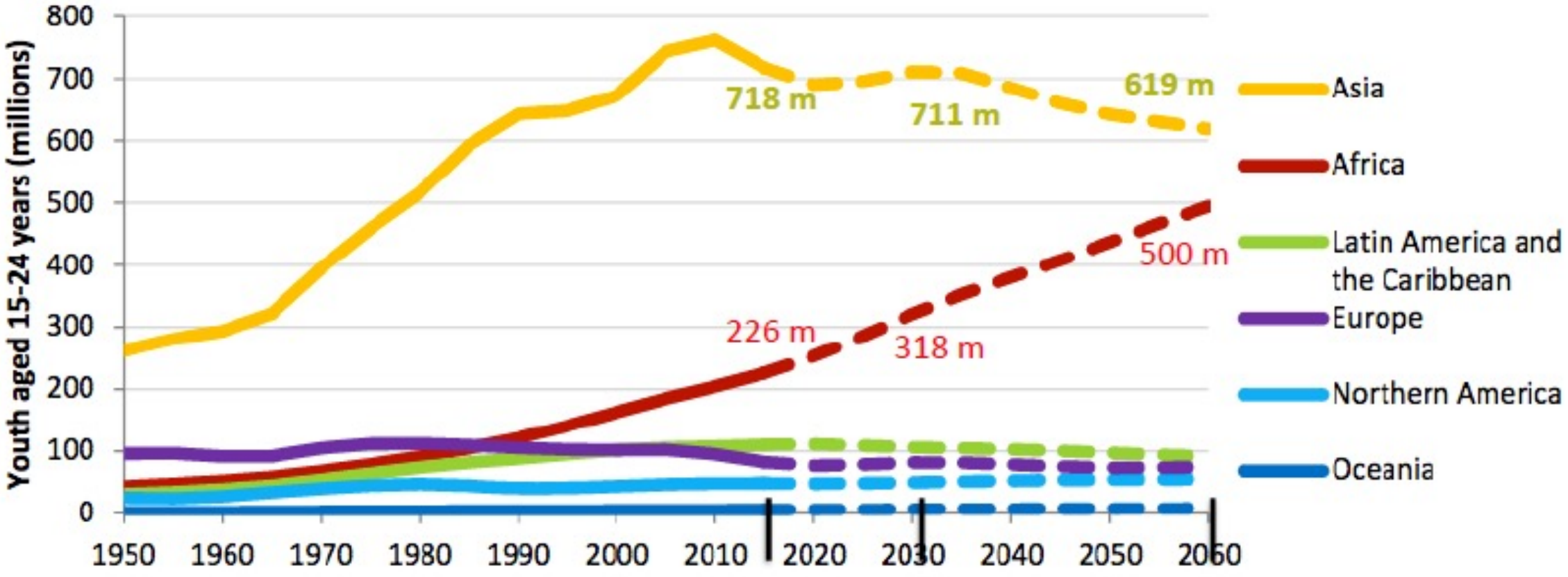


In 2050, 80% out of the global population will be in Africa & Asia

Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision

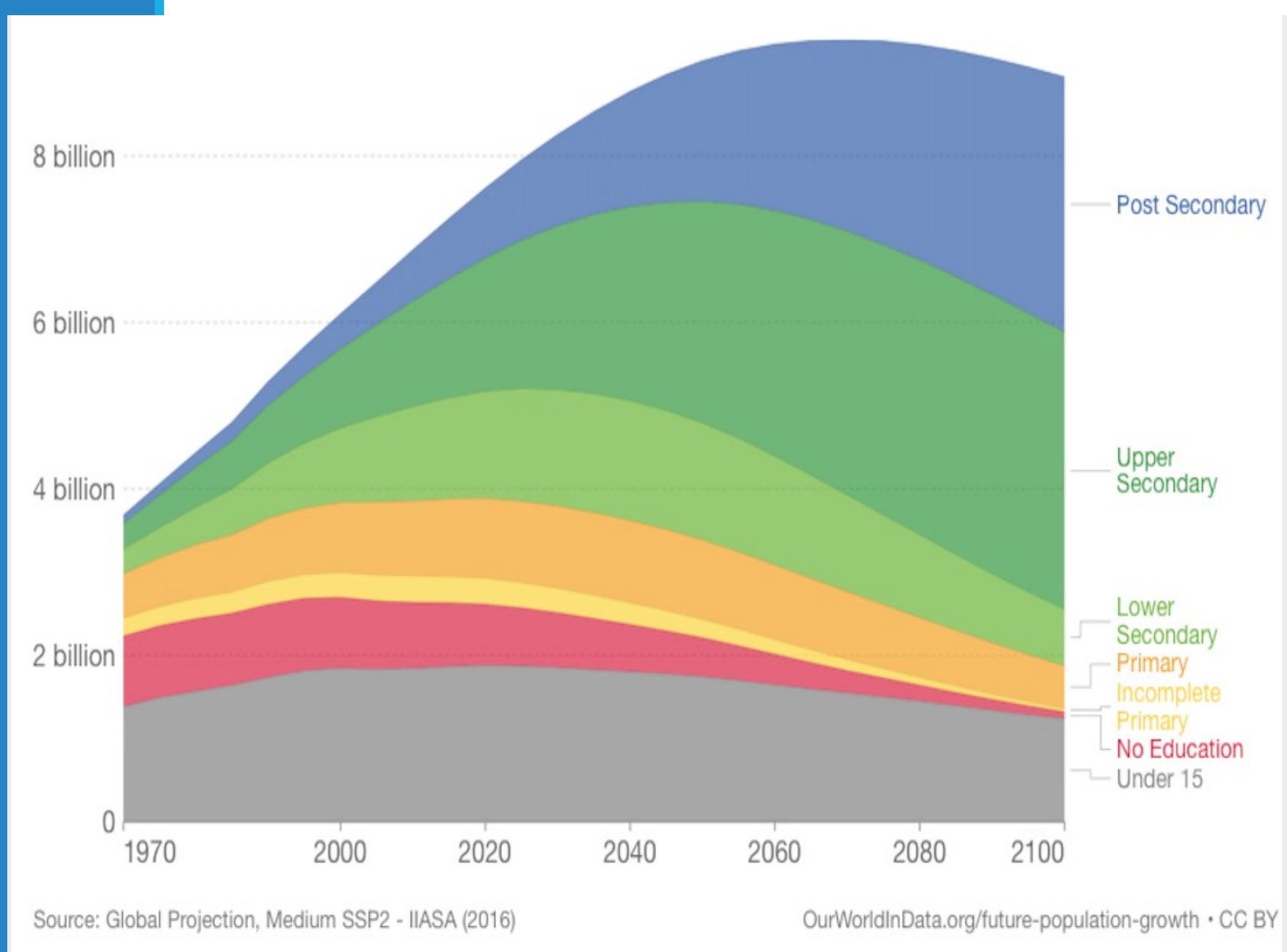
Distribution of Youth Population (15-24 years)

Figure 1. Youth aged 15-24 years, by region, 1950-2060



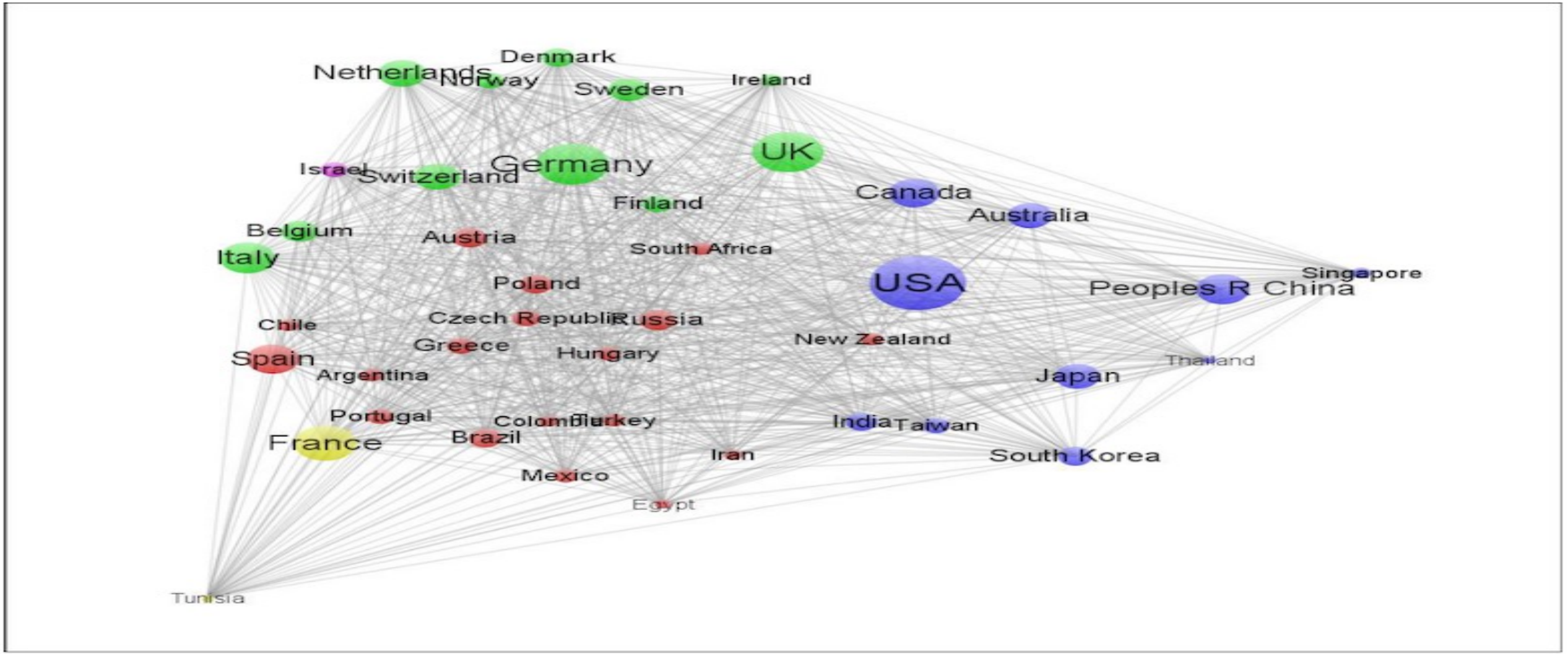
Data source: United Nations (2013) *World Population Prospects: The 2012 Revision.*

Expansion of Global Knowledge Society

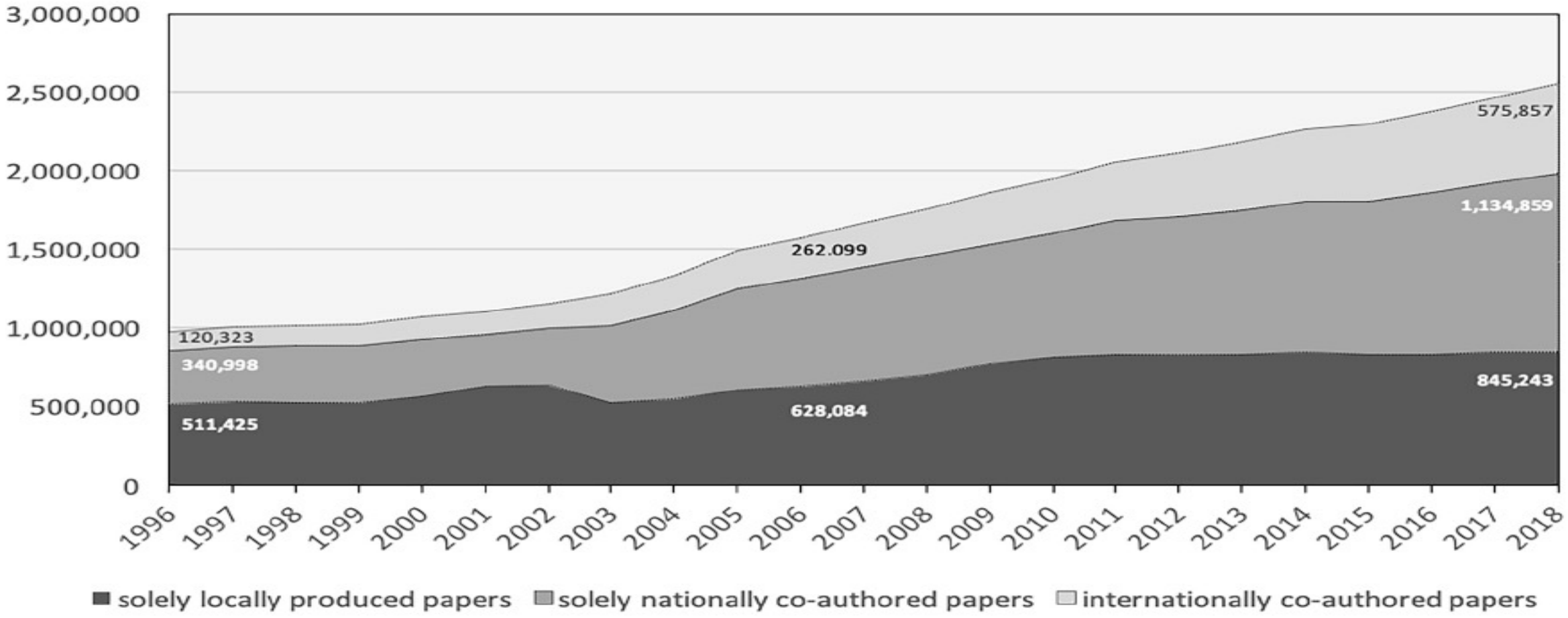


Expansion of Middle Class → Rising Demand for Education

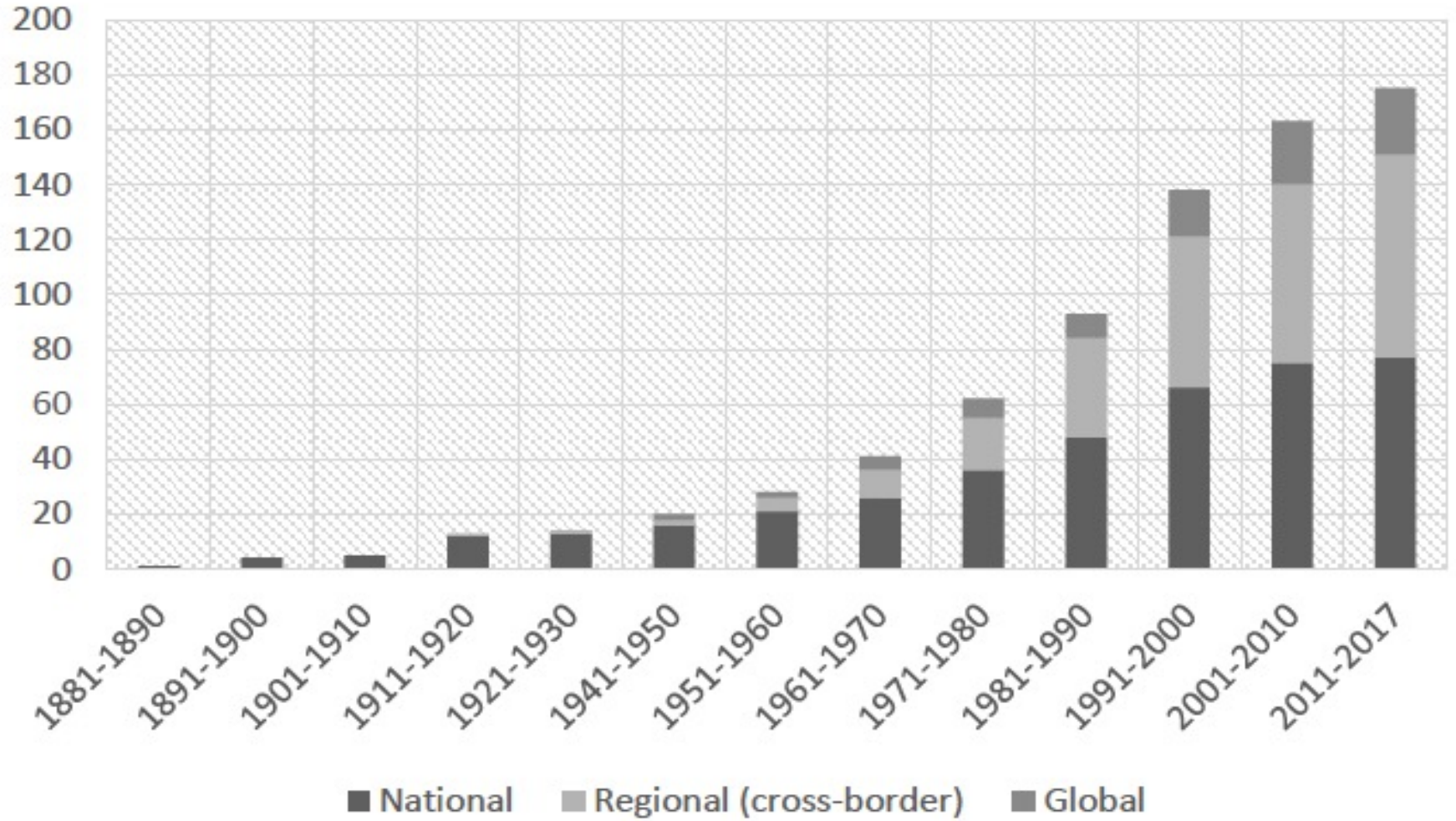
Shift from bi-polar to multi-polar world



Number of published papers in Scopus, world, 1996 to 2018



University Associations by Field-Level and Decade Established



Global Science Landscape

Nation-states remain primary arena of/for HE, but systems are open, and boundaries are necessarily permeable.

—More and more diverse providers,

—Increasing collaboration and interdependence of education and research,

—Universities are collaborators and competitors simultaneously,

—Global mobility rising, and shifts in geographic of global talent pool.

Geopolitical tension are underpinned by knowledge and science – which is the backbone of the economies of the 21st century.

Integration of the global economy and labour market and internationalisation of the educational enterprise is also changing the way we think about quality and accountability.

Accountability and impact agenda

Accountability

Early roots of accountability in classical Athens which "mandated visibility, rectitude, and the participation of citizens". (Espeland and Sauder, 2016, 20)

Public accountability associated with "ever increasing complexity of governance" (Bovens et al., 2014, p. 16), and concerns about misuse of public funds, "fuelled by scandal and perceived misuse of authority in both the private and public sectors" (Leveille, 2013, p. 6).

Accountability concerns "obligation to report to others, to explain, to justify, to answer questions about how resources have been used, and to what effect" (Trow, 1996).

> *It is about meeting the needs of students, society and government. It is about the effectiveness and performance of colleges and universities as well as their transparency of their efforts. Accountability is about higher education serving the public interest and about higher education as a public trust* (Eaton, 2016, p. 325).

Shift from self-declaration to external validation

Academy has been defined/guided by norms of academic-professional self-regulation and self-governance, with ownership and responsibility resting with autonomous academics and HEIs. But this is no longer trusted or sufficient.

—HEIs accused of being insufficiently accountable to students/society for learning outcomes, graduate attributes and life-sustaining skills,

—New ground-rules for continued public endorsement and financial support for university-based research.

If HE is the engine of the economy – then its productivity, quality and status is a vital indicator of sustainability and a nation's competitiveness.

"The question of the governability of science cannot be posed in isolation from the question of the governance of the university" (Delanty, 2002, 185)

Rankings are part of the accountability agenda.

1. Quality

No internationally agreed-upon definition…or how it should be measured, much less improved.

Everyone has their own perspective, as evidenced by the different approaches, methodologies, and choice of indicators.

Emphasis has primarily been on T&L and research, but increasingly reflects capacity/capability of HE to meet a variety of societal needs and demands.

Means “quality” is variable, and is shaped by who-ever decides, by the choice of methodology (qualitative or quantitative) and the indicators – rather than on the basis of standards.

Academics may understand why this is so and why context matters, but to others this seems to be just a(nother) form of obfuscation.

2. Accountability & Transparency

Traditional approaches have relied on collegiality, expert judgment, and peer review.

More quantitative and externally-driven approaches have emerged in recent decades, including rankings, with greater emphasis on measuring outcomes and learning gain.

Students have become an important part of the process.

But, as our systems become even more diverse, participation of third-parties, including business and employers, becomes inevitable.

- New technologies make the participation of citizens easier than ever.

Range of different instruments being developed illustrates urgency and multi-stakeholder involvement, including growing web of knowledge intelligence businesses.

3. Performance and Productivity

Performance asks how well HEIs operate vis-à-vis their goals and those of society:

—Focus on actual outcomes and outputs rather than simply the process,

—Attention shifted onto academic and professional staff and students.

Productivity asks about what academics produce through their teaching, and issues of academic outputs and outcomes, such as progression and graduate employment.

Speaks directly to public and political perceptions about *what academics do all day or all year*.

4. Impact, Contribution and Benefit

Impact has tended to be measured in terms of citations or rather interactions between academics

Academic criticism conjoined with public concerns

- Instead, there is a need to go beyond direct “tangible” impact (e.g., output, outcome) to include much broader range of impact parameters, including scientific human capital, skill sets, etc.

Value for money, including impact and societal benefit not just benefit for the scientific community: public good, public value and social contract.

5. Public Information & Transparency

As HE expands and diversifies more people have experience and require a voice.

—Participation by third-parties, including students, business and employers, becomes inevitable,

—New technologies make the participation of citizens easier than ever.

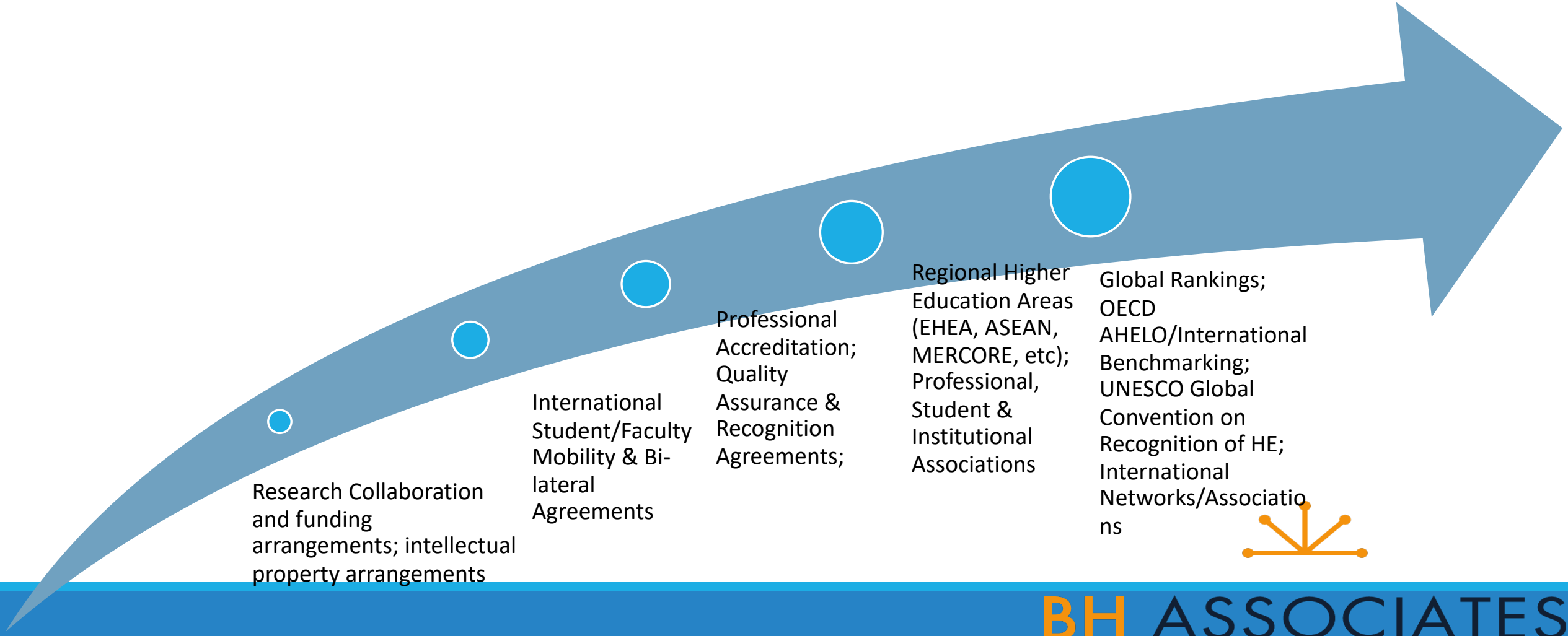
Traditional formats too often:

—Provide information which insufficiently useful/robust to explain educational quality and likely outcomes or comparable,

— Written in formats and styles which are difficult to decipher and understand,

—So many formats, surveys and rankings presenting a confusing picture.

Evolving Architecture of Global Governance of HE and Science



Three Inter-related Issues

Public attitudes towards public services including higher education,

Degree of *public trust* between different sectors of society, e.g. HE, students and employers;

Public interest in effective and efficient use of public resources, and contribution and value back to society.

To discuss...

What kinds of accountability and transparency instruments/tools – for assessing, measuring and comparing quality and outcomes – are fit for purpose in the 21st century?

How do we balance different perspectives with expanding societal demands?

What should accountability tools look like in the new global era?

Policy development and instruments

Navigating shift from local to national to global

Because nations compete on basis of their knowledge and innovation systems, HE has been transformed from an institution with a local/sub-national remit to being cornerstone of economic policy with geopolitical responsibilities.

> *"…that any country that out-educates the United States will outcompete the United States, and that is a fundamental national security issue."* *Jake O'Sullivan, US National Security Advisor, 2021*
>
> *How well universities perform is equivalent to an "instrument of competitive battle and influence"* *(Andrei Fursenko, Russian Minister for Education and Science, quoted in Kishkovksy, 2012)*

Rise of global rankings coincide with current phase of globalization:

- Global rankings have become a game-changer;
- Placed HE within a wider comparative and international framework
- Cross-national comparisons inevitable

Government steering and (re)regulation

National systems increasingly steered – as expressed through a balance between autonomy and accountability, such as:

—**National strategies** – visions and ambitions,

—**PBF/priority funding** aims to align HE actions with national policies in education and research.

—**Public value** asks about the contribution to society and the public good – and the impact upon citizens in their daily lives;

—**Responsible research and innovation** (RRI) asks about the effects, potential impacts and benefits of research on the environment and society;

—**Quality Assurance/Accreditation** assesses performance & regulates qualifications;

—**Open science** is about sharing the practices of research and making the results of publicly-funded research publicly accessible;

Examples of Policy Responses/Instruments

UK – REF, TEF and KEF, Learning Gain

US – "Score Card"/College Dashboard," IPEDS

Europe/US States: Performance-based/targets funding via formulaic budgeting and/or compacts

Australia – QILT (Quality Indicators for Learning & Teaching)

OECD – Benchmarking, PISA, AHELO

Assessment of Learning Outcomes

- Survey of Student Engagement (US + Canada, Australia, China, South Africa, New Zealand, Ireland)
- Collegiate Learning Assessment (US)

Lumina and Gates foundations, Complete College America, Measuring Up trying to shape the field.

EU Responses

Bologna – QA, ESG, ECTS, EQF, ENQA/ EQAR/DEQAR,

- mobility requires trustworthy information with the assurance that credentials are mutual recognisable
- UNESCO Global Convention on the Recognition of Qualifications concerning Higher Education

Rankings: U-Map and U-Multirank

Societal Engagement: E 3M; HE Innovate; NESET Indicators

ETER, CALOHEE, EUROGRADUATE,

EURITO, Next-Generation Metrics, and Open Science

Mechanism for bringing these different stand-alone projects together

Rankings Reflect Global Competition

Rankings are manifestation of globalization and marketisation of HE – and the "battle for world class excellence":

- Provide a framework or lens through which global economy and national (and supra-national) positioning can be understood;
- Gauge national competitiveness and world class status in terms of the knowledge-producing and talent-catching capacity of HEIs;
- Order global knowledge by giving weight and prominence to particular disciplines/fields of investigation, and their outputs and impact;

Rankings both reflect and help structure the geo-political dynamics in the world economy and global science.

Changing balance of power (ARWU) (Hazelkorn, 2021)

TABLE 3.1 ARWU distribution of universities in top 20–top 500 by world region, 2004 and 2020

Region	Top 20		Top 100		Top 200		Top 500	
	2004	2020	2004	2020	2004	2020	2004	2020
Americas	17	15	55	45	101	75	200	161
Europe	2	5	37	36	79	77	209	185
Asia/Oceania	1	—	8	19	21	48	89	149
Africa	—	—	—	—	—	—	4	5

SOURCES: *Academic Ranking of World Universities*, 2004 and 2020. Retrieved December 28, 2020, from http://www.shanghairanking.com/ARWU-Statistics-2004.html; http://www.shanghairanking.com/ARWU-Statistics-2020.html

Research vs. Reputation

Rankings	Research	Reputation
Academic Ranking of World Universities [*ARWU*] (Shanghai Jiao Tong, China)	100	50
Times Higher Education World University Ranking [*THE*] (UK)	93.5	33
Quacquarelli Symonds World Ranking [*QS*] (UK)	70	50

NB. Computation based on an assumption of a strong correlation between academic reputation and research/research related activities.

Societal Engagement as ‘pathway to impact’ (UKRI, REF):

Greenmetric World University Ranking (Universitas Indonesia) compares “commitment of universities towards going green & promoting sustainable operation”.

Washington Monthly College Guide assesses universities as engines of social mobility, supporting academic minds and scientific research that advance knowledge and drive economic growth, and inculcate/encourage ethic of service.

QS Social Responsibility Ranking assesses how university benefits society beyond its walls as well as the society within them as part of its QS Stars rating system.

U-Multirank measures regional engagement: student internships, graduate employment, and engagement with regional organisations, while KT measured as collaboration with industry, patents/spinoffs and co-publications with industry.

NESET – Toolbox for Community Engagement in HE, EU

Regional Innovation Impact Assessment Framework for Universities (RII), JRC

Times Higher Impact Ranking

Methodology:

Universities submit data in as many SDGS as want;

Data required for SDG 17 + at least 3 other SDGs;

SDG 17 = 22% of final score;

Research = 27% of each SDG against which data is submitted;

Universities submit evidence to support other indicators;

Only 1118 universities from 94 countries (2021);

Heavy reliance on institutional data;

Unlikely *THE* can control/validate accuracy & comparability of information provided;

Evaluation conducted behind closed-doors

Submissions provide lucrative institutional data-set which remains behind a pay-wall.

Rankings and Open Science

Reliance on bibliometric and citation data:

- ARWU: Citation Index/HiCi data = 40%
- QS: Citations per Faculty (Scopus) = 20%
- THE: Citation data = 30%

Research culture changing:

- Citation index provided basis for sophisticated rankings beginning 1960s
- Bibliometric/citation practices are inaccurate measures of research activity and quality;
- Wrongly assumes journal impact equates with article impact;
- Value and impact of all outputs beyond research articles growing in importance;
- JIF –too many deficiencies;

Break Out Discussion: Rankings

Final thoughts

Colleges and universities are being asked to rethink what they do – how quality and excellence are understood, pursued, and reinforced or recognized.

What is the public value that we bring to citizens and their communities?

Are we sufficiently focused on student success and our own effectiveness as teachers and responsibilities as scholars?

Are we sufficiently concerned about the impacts and benefits on society and the environment of our scholarship rather than just publication and citation counts—or have we confused public interest with self-interest?

Universities have a responsibility to own the problems facing society. After all, we teach the doctors and health professionals, the social scientists, the linguists and the engineers, as well as the teachers.