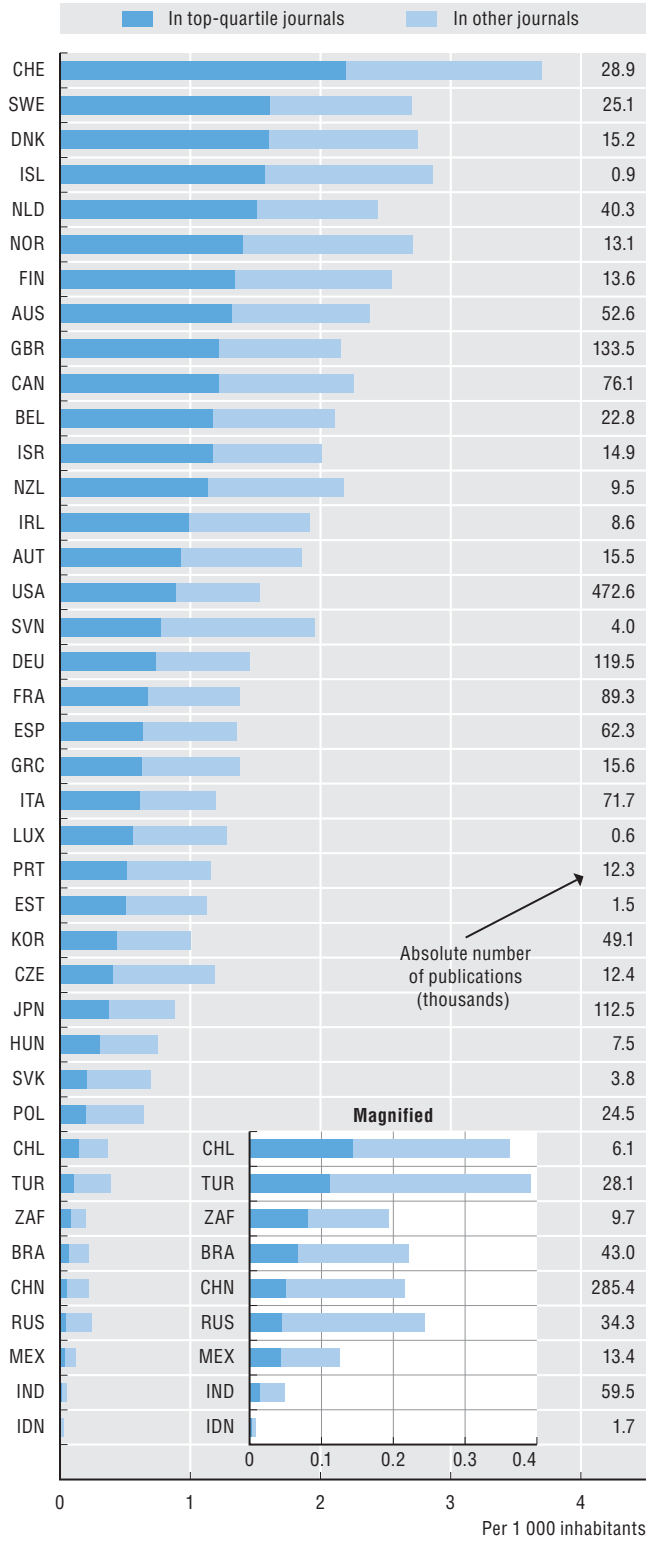
3. Science links

The quantity and quality of scientific production, 2009

Publications (whole counts)



Source: OECD and SCImago Research Group (CSIC) (forthcoming), *Report on Scientific Production*, based on Scopus Custom Data, Elsevier, June 2011.
See chapter notes

StatLink http://dx.doi.org/10.1787/888932486260

Publications in top journals provide a measure of "quality-adjusted" research output. Switzerland has the highest rate of high-quality publications on a per capita basis among OECD and BRIICS (Brazil, the Russian Federation, India, Indonesia, China, South Africa) countries, followed by Sweden and Denmark. In absolute numbers, the United States is the leading producer of publications in top journals, followed by the United Kingdom. If total publications are considered, independently of quality, the United States remains the leader but China takes the second position. The share of emerging economy publications in the world total is rising fast although the percentage published in top quartile journals is below the world average.

Collaboration among institutions is an increasingly pervasive and important feature of scientific research. The indicators show that international scientific collaboration results in research with high impact (as measured by citations) – and that the broader the collaboration, the higher the impact of the research.

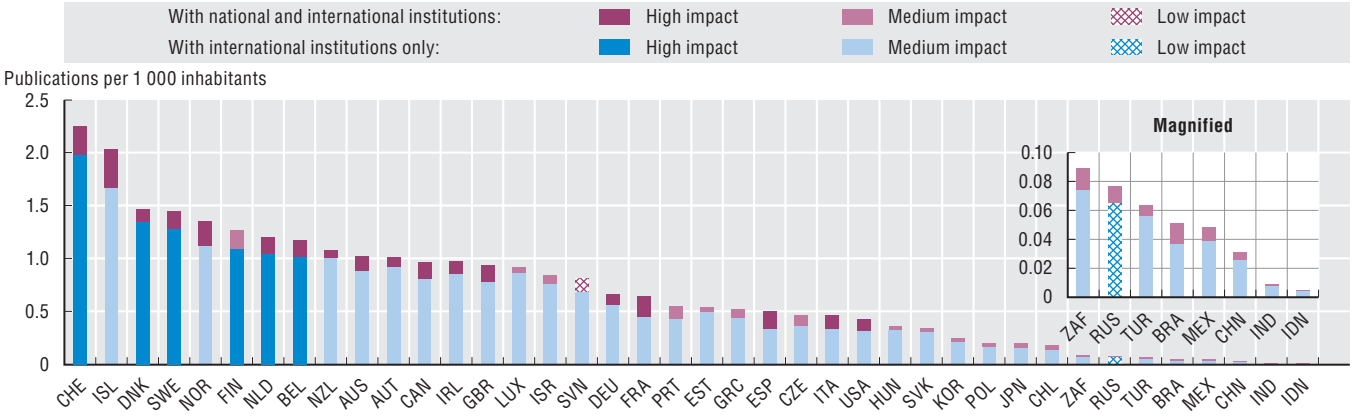
Small countries are generally more likely to engage in international collaboration than larger ones although this is not always the case and there are differences among disciplines. The average impact of publications not involving international collaboration tends to be, at best, above the world average (medium impact). The best average outcomes for publications not involving any type of institutional collaboration are reported for countries with high publication output per capita or with sizeable research institutions that offer broad scope for significant collaboration among researchers.

Definitions

Publication counts in *top quartile journals* are defined as publications in the reference period by authors affiliated to an institution in a given country published in the most influential 25% of the world's scholarly journals in their category, as ranked by the *SCImago Journal Rank* (SJR) indicator (*www.scimagoir.com*) on the basis of citation data. *Collaboration* is defined as co-authorship involving different institutions. *International collaboration* refers to publications co-authored with institutions in another country. *International and national collaboration* refers to co-authorship involving both foreign and domestic institutions. *National collaboration* concerns publications co-authored with institutions within the reference country. *No collaboration* refers to publications not involving co-authorship across institutions and includes single-author articles as well as intra-institutional collaboration. *Normalised impact* is the ratio of the average number of citations received by the documents published by a specific unit to the world average of citations of the same time period, document type and subject area. If an article belongs to several subject areas, a mean value of the areas is calculated.

The impact of international scientific collaboration by institutions on research output, 2009

Publications by impact and type of collaboration, per 1 000 inhabitants

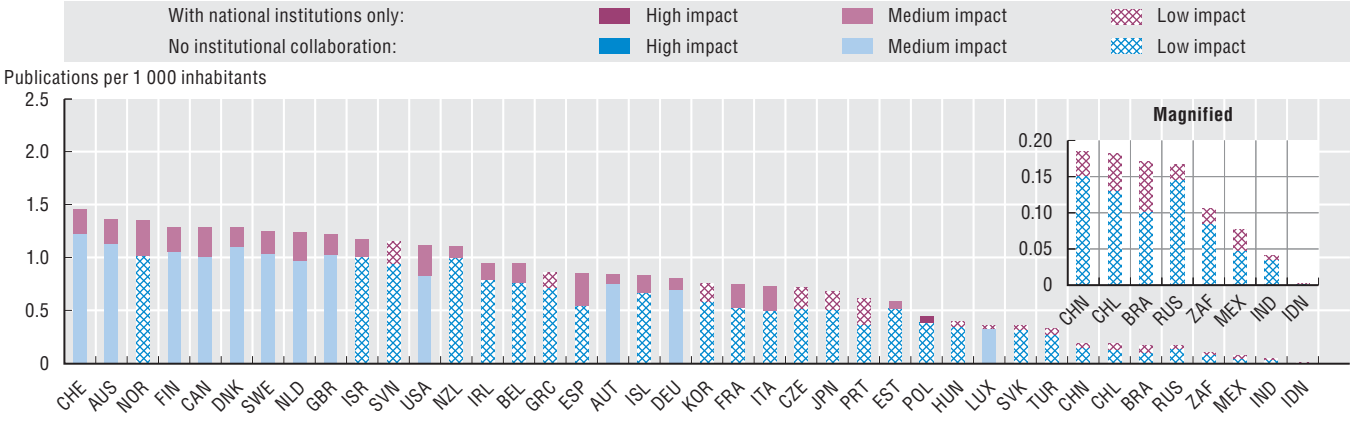


Source: OECD and SCImago Research Group (CSIC) (forthcoming), *Report on Scientific Production*, based on Scopus Custom Data, Elsevier, June 2011. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932486279

The impact of domestic scientific collaboration by institutions on research output, 2009

Publications by impact and type of collaboration, per 1 000 inhabitants



Source: OECD and SCImago Research Group (CSIC) (forthcoming), *Report on Scientific Production*, based on Scopus Custom Data, Elsevier, June 2011. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932486298

Measurability

The frequency of citations to journals in which scholars from different institutions and countries publish can be considered an objective measure of the quality of a journal's standards and the material it publishes. Information on institutions' publications in the top quartile of journals, ranked by the citations that those journals typically achieve, can therefore serve as an indicator of the expected impact of institutions' scientific production.

Publications are attributed to countries on the basis of the authors' institutional affiliations. When attributing publications to a given unit, such as a country, it is important to find an appropriate way to count publications that involve co-authorship across units. One approach is to fractionalise publications by contributing units; this allows the reported figures to add up to the total number of publications. An alternative, which does not penalise a unit for engaging in collaborative authorship, is to report total counts per unit; this is the "whole counts" approach. Although the chosen method does not greatly affect country rankings, care should be exercised when interpreting either type of results.