A GUIDE TO THE NATURE INDEX

A description of the terminology and methodology used in this supplement, and a guide to the functionality available free online at natureindex.com

The Nature Index is a database of author affiliations and institutional relationships. The index tracks contributions to articles published in a group of highly selective science journals, chosen by an independent group of active researchers.

The Nature Index provides absolute and fractional counts of publication productivity at the institutional and national level and, as such, is one indicator of global high-quality research output. Data in the Nature Index are updated regularly, with the most recent 12 months made available under a Creative Commons licence at natureindex.com. The database is compiled by Springer Nature.

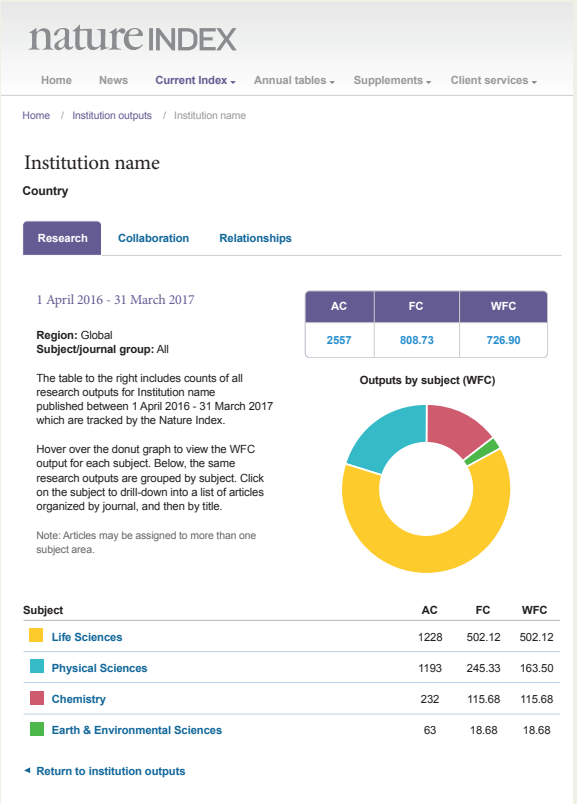
The list of journals tracked by the Nature Index will be extended in 2018.

NATUREINDEX.COM

A global indicator of high-quality research

natureindex.com users can search for specific institutions or countries and generate their own reports, ordered by article count (AC), fractional count (FC) or weighted fractional count (WFC).

Each query will return a profile page that lists the country or institution's recent outputs, from which it is possible to drill down for more information. Articles can be displayed by journal, and then by article. Research outputs are organized by subject area. The pages list the institution or country's top collaborators, as well as its relationship with other organizations. Registering allows users to track an institution's performance over time, create their own indexes and export table data.



NATURE INDEX METRICS

There are several measures provided by the Nature Index to track affiliation data. The simplest is the article count (AC). A country or institution is given an AC of 1 for each article that has at least one author from that country or institution. This is the case regardless of the number of authors an article has, and it means that the same article can contribute to the AC of multiple countries or institutions.

To get a sense of a country's or institution's contribution to an article, and to ensure they are not counted more than once, the Nature Index uses the fractional count (FC), which takes into account the share of authorship on each article.

The total FC available per paper is 1, which is shared among all authors under the assumption that each contributed equally. For instance, a paper with 10 authors means that each author receives an FC of 0.1. For authors who have joint affiliations, the individual FC is then split equally between each affiliation.

Another measure used is the weighted fractional count (WFC), which applies a weighting to the FC to adjust for the over-representation of papers in astronomy and astrophysics.

Four journals tracked by the index in these disciplines publish about 50% of all papers in journals in physical sciences — about five times the equivalent percentage for other fields. Although the data for astronomy and astrophysics are compiled in the same way as for other disciplines, articles from these journals are assigned a fifth the weight of other articles (the FC is multiplied by 0.2 to get the WFC).

The total FC or WFC for an institution is calculated by summing the FC or WFC for individual authors. The process is similar for countries, although complicated by the fact that some institutions have overseas labs that will be counted towards host country totals.

The fourth metric is bilateral collaboration score (CS). A bilateral collaboration can be between any two institutions or countries co-authoring at least one paper in the journals tracked by the Nature Index. CS is derived by summing the FCs from papers with authors from both institutions. If institution A has co-authored a paper with another institution B, then the collaboration score between A and B is the sum of the FC for A+B.

Every effort is made to count affiliations consistently, with a background of reasonable assumptions. For more on how the affiliation information is processed and counted, see the FAQ section at natureindex.com.

THE SUPPLEMENT

Nature Index 2017 Science Cities is based on data from natureindex.com, covering articles published from 1 January 2012 to 31 December 2016. Each city's WFC is calculated by summing the output of institutions definitively located in it.

For institutions spanning multiple cities, such as CAS, CSIC and IBS, entities were assigned to the city where they are located, where possible. For a small number, output from remote or virtual entities may have been assigned to the city of their principal institution or excluded.

THE TABLES

The Nature Index 2017 Science Cities tables show each city's leading institutions for high-quality science, ordered by WFC, AC and CS for 2016. Also shown are WFC from 2012, the change in WFC between 2012 and 2016 and the AC for 2016. Collaboration tables rank the top intra-city institution pairs by their bilateral collaboration score in 2016. ■