Bibliometric measurements can be used to assess the output and impact of an individual’s research. These types of measures are often taken into account when applications for tenure, promotion or grants are considered. It is important to be aware of the various metrics that can be used in such assessment and the different data sources available.

- Metrics range from simple publication or citation counts to mathematical formulae which take into account both the output and impact of a researcher’s work.
- The three main bibliometric tools: Web of Science; Scopus; and Google Scholar (in collaboration with Publish or Perish software), provide automatic metrics for individual researchers and they also contain the raw data that can be used to manually calculate or verify metrics. There are also some specialised tools for certain disciplines.
- The bibliometric tools each cover a different range of data, and return different results for an author. This should be kept in mind when assessing individual metrics in any of the tools.
- It is worth evaluating each tool to establish its coverage of publications within the academic’s research area before using it.

The Metrics

A variety of metrics have been developed to help assess the output of researchers. Here are some of the most popular:

1. **Total number of papers**: a simple count of the number of papers a researcher has published
2. **Total number of citations**: a count of all the citations received by a researcher’s published works
3. **The h-index**: has become the most popular metric for assessing the output of individuals since it was developed by Hirsch in 2005. The h-index of an individual is the number of their papers that have been cited at least h times e.g. a researcher has an h-index of 25 if 25 of their papers have been cited at least 25 times.
4. **A number of variations on the h-index** have emerged. These include:
   a. **Egghe’s g-index**: which gives more weight to the highest cited papers
   b. **The individual h-index**: which accounts for co-authorship in calculating impact by giving less weight to such papers
   c. **The contemporary h-index**: gives less weight to older cited papers
   d. **The age-weighted citation rate**: which also accounts for the age of papers

The bibliometric tools discussed below each provide some or all of these metrics for individual researchers.

### Web of Science

- Web of Science (WoS) is part of the ISI suite of products and is the current market leader for bibliometrics.
- WoS allows you to use the Author Finder to identify a single author and view a list of their publications including citations.
- For this list of publications you can also generate a Citation Report. This provides metrics including the h-index, total number of papers and total number of citations. Charts and year-by-year citation analysis are also provided.
- Another product from the ISI suite, Essential Science Indicators, covers 22 fields in science and provides data for ranking scientists.

### Google Scholar & PoP

- Publish or Perish software (PoP) works with Google Scholar data to produce metrics for published material. Some data is available directly from Google Scholar.
- Google Scholar covers a lot of material not well represented in the other bibliometric tools and it may be the best option for researchers who are not well represented in Web of Science or Scopus.
- PoP produces a wide range of metrics for individuals, much more than are provided by the other tools.
- In PoP it is important to check the list of results for errors and duplicates and remove them.

### Scopus

- Scopus allows you to conduct an Author Search to identify a single author. The search contains useful tools for author disambiguation - by country, affiliation etc.
- For each author you can choose View Citation Overview to see a list of publications with citation counts and h-index is given.

### Name Variants

Metrics such as the citation count and therefore h-index are based on a set of publications attributed to an individual. It is important that this set of publications accurately reflects your publication output.

It is advisable to use the same name consistently throughout your career e.g. S.E. Jones NOT S. Jones or Sarah E. Jones.

Some tools are better as author disambiguation than others and allow you to suggest changes to your author profile and maintain a list of author name variants.

There are also specialist services you can sign up where you are assigned a unique ID and can maintain your own publication record. This ID can then be used to more accurately display your publications and carry out analysis. Such services include Researcher ID and ORCID.