Metrics

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Basic General Metrics

Total Publications ($n$)
• Basic measure of output volume
• Sensitive to institution size, document type selection and index coverage

Total Cites ($c$)
• Basic measure of academic impact
• Sensitive to institution size, document type selection and index coverage

Average cites per paper ($c/n$)
• Basic measure of academic impact
• Sensitive to subject area, document type selection and outliers
Common Author Metrics

H-Index (value of $n$ if author has $n$ publications with at least $n$ citations each)
- Represents both output volume and citation score in one metric
- Sensitive to career length, subject area and output volume

H-Index Variants
- Include the g-index (value of $n$ if author has $n$ publications with $n^2$ citations in total) and m-quotient (adjusts h-index for number of years research active)
- No variant to date accounts for all major problems with the basic h-index

I-10 Index
- The number of Google Scholar publications with at least 10 citations
- Sensitive to data error, subject area, output volume, career length, paper type

Impact Factor of journal in which papers published (see definition later)
- Represents average recent citations to a journal not to the paper
- While commonly used, should be strenuously avoided
Robust Metrics

Relative Citation Impact
• Divides the average citations for a set of papers in a given period and subject by the global average in the same period and subject; given relative to a world average of 1.00
• Sensitive to article age within the period and multi-subject papers

Normalised Citation Impact (or Crown Indicator, Field-Weighted Citation Score)
• Divides each article citation count by global average for papers of the same year, subject(s) and type, then averages resultant ratios; given relative to a world average of 1.00
• Sensitive to outliers due to abnormally distributed citation counts

Citation Percentiles
• Ranks each paper by cites against papers in the same year and subject; given as a proportion meeting a threshold ($n\%$ in the top $x\%$ globally) or an average percentile
• Threshold calculations sensitive to sample size; average calculation affected by arithmetic problem for recent years
Journal Metrics

Impact Factor
• Citations from year $x$ to articles in years $x-1$ and $x-2$ divided by article count for years $x-1$ and $x-2$
• Most widely used metric, but sensitive to document type, inflation, outliers, self-citation and subject

Scimago Journal Rank Indicator
• Weighted citations from year $x$ to articles in years $x-1$, $x-2$ and $x-3$ (less self-cites) divided by article count for years $x-1$, $x-2$ and $x-3$
• Sensitive to document type, outliers and subject

Eigenfactor
• Proportion of weighted citations from year $x$ to articles from the last 5 years
• Sensitive to journal size, subject area and document type selection

Source-Normalised Impact per Paper
• Average citations for citations from year $x$ to articles in years $x-1$, $x-2$ and $x-3$ (less self-cites) divided by article count for years $x-1$, $x-2$ and $x-3$, normalised by citing source
• Sensitive to document type selection and outliers
Collaboration Metrics

% Collaborative Papers
• Proportion of publications with or without collaboration (domestic, international, industrial, any)
• Sensitive to article age, type and subject

Network Metrics
• Constructed from a metric using countries, institutions or authors as nodes and collaboration on papers as the links among them
• A number of metrics can be derived from this (including degree centrality, betweenness centrality and eigenvector centrality)