1. Indicators Used for Creating Nomenclature

Abstract

This dataset compiles a comprehensive range of research impact indicators structured to support nomenclature development in assessing research efficacy and influence. Covering qualitative, quantitative, and mixed measures, the dataset identifies indicators that evaluate research outcomes, contributions to scientific methods, community engagement, policy impact, and environmental influence. Each indicator is linked to established references, indicating its measure type and application. The qualitative indicators assess intangible aspects, such as knowledge dissemination and methodological advancements, while quantitative metrics track tangible outputs like publications, funding, and patents. The mixed measures blend qualitative insights with quantitative outcomes, providing a nuanced view of research impact. This dataset is valuable for researchers, policymakers, and institutions seeking to systematically assess and benchmark research contributions across disciplines and their broader societal effects.

Research Impact Indicators

Table D5-1: List of Research Impact Indicators

| **Ref** | **Indicator** | **Reference** | **Measure** | **Qualitative/ Quantitative** |
| --- | --- | --- | --- | --- |
| 1 | Identification of research gaps, questions and new research dimension | (Heller & de Melo-Martín, 2009; Kuruvilla, Mays, Pleasant, & Walt, 2006; W. M. Trochim, Marcus, Masse, Moser, & Weld, 2008; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 2 | Development of a new technique for data collection and new data | (Heller & de Melo-Martín, 2009; Sung et al., 2003) | Yes / NoŦ | Qualitative |
| 3 | Creation of a research method or extension of existing by involving a new approach and technique | (Kuruvilla et al., 2006; W. M. Trochim et al., 2008) | Yes / NoŦ | Qualitative |
| 4 | Defining the concept and subject vocabulary in a more comprehensive way | (Mankoff, Brander, Ferrone, & Marincola, 2004; W. M. Trochim et al., 2008) | Yes / NoŦ | Qualitative |
| 5 | Formation of research groups and collaboration in multidimensional research | (S. R. Hanney, Grant, Wooding, & Buxton, 2004; Heller & de Melo-Martín, 2009; Kuruvilla et al., 2006; W. M. Trochim et al., 2008) | Yes / NoŦ | Qualitative |
| 6 | Recruitment of skilled researchers | (Heller & de Melo-Martín, 2009) | How many researchers are recruited? | Quantitative |
| 7 | Development of communities of science, new grant programmes, replication and new research | (S. Hanney, Buxton, Green, Coulson, & Raftery, 2007) | Yes / NoŦŦ | Mixed |
| 8 | Effective planning and addressing future research | (Gordon & Meadows, 1981) | Yes / NoŦ | Qualitative |
| 9 | Research capacity building for an individual or a group of researchers | (Buxton & Hanney, 1996; Raftery, Hanney, Greenhalgh, Glover, & Blatch-Jones, 2016) | How many researchers are trained? | Quantitative |
| 10 | Preparing a better procedure for researchers' induction | (Heller & de Melo-Martín, 2009; Sung et al., 2003) | Yes / NoŦ | Qualitative |
| 11 | Improvement in ethical approval processes for better decisions and timeliness | (Pober, Neuhauser, & Pober, 2001; Sung et al., 2003) | Yes / NoŦ | Qualitative |
| 12 | Formation of new research teams and projects | (Pober et al., 2001) | How many projects and teams are established? | Quantitative |
| 13 | Successful completion of ongoing research with the achievement of set targets | (Weiss, 2007) | Yes / NoŦŦ | Mixed |
| 14 | Retention of the research team by involving in productivity and future research | (Heller & de Melo-Martín, 2009; Kuruvilla et al., 2006; Nathan, 2002) | How many members are retained? | Quantitative |
| 15 | Advancement in numbers and quality of research and research teams | (Nathan, 2002; Pober et al., 2001; W. M. Trochim et al., 2008; Weiss, 2007) | Yes / NoŦŦ | Mixed |
| 16 | Enhancement of research process, behaviour and procedural protocols | (Heller & de Melo-Martín, 2009; Pober et al., 2001; Sung et al., 2003) | Yes / NoŦ | Qualitative |
| 17 | Recognition and leadership of researchers in the research domain | (Kuruvilla et al., 2006; Pober et al., 2001) | Yes / NoŦ | Qualitative |
| 18 | Improvement of research communication between researchers and research organisations | (Heller & de Melo-Martín, 2009; Mankoff et al., 2004) | Yes / NoŦ | Qualitative |
| 19 | Serving as research staff on a higher level in more advanced organisations at national and international levels | (Kuruvilla et al., 2006; Sung et al., 2003) | Yes / NoŦ | Qualitative |
| 20 | Improvement in research culture and overall environment | (Heller & de Melo-Martín, 2009; Kessler & Glasgow, 2011; Mankoff et al., 2004; Pober et al., 2001; Sung et al., 2003) | Yes / NoŦ | Qualitative |
| 21 | Identification and overcoming of the research process constraints | (Heller & de Melo-Martín, 2009; Pober et al., 2001) | Yes / NoŦ | Qualitative |
| 22 | Improved willingness and tangible measures for practice-based and applied research | (Westfall, Mold, & Fagnan, 2007) | Yes / NoŦ | Qualitative |
| 23 | Development of improved analytical methods for existing data | (Kessler & Glasgow, 2011; Kuruvilla et al., 2006; W. M. Trochim et al., 2008; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 24 | Improvement in multi-disciplinary research methods | (Kuruvilla et al., 2006) | Yes / NoŦ | Qualitative |
| 25 | Creation of methods for cross domains results in interpretation and synthesis | (Kuruvilla et al., 2006; Pang et al., 2003) | Yes / NoŦ | Qualitative |
| 26 | Embracing the innovative methods for measuring the research outcome | (Dougherty & Conway, 2008; W. M. Trochim et al., 2008) | Yes / NoŦ | Qualitative |
| 27 | Discovery of new or advanced research findings | (Lavis, Ross, McLeod, & Gildiner, 2003; Mankoff et al., 2004) | Yes / NoŦ | Qualitative |
| 28 | Discovery of novel knowledge or innovative techniques | (S. R. Hanney et al., 2004; Kalucy, Jackson-Bowers, McIntyre, & Reed, 2009; Lavis et al., 2003; W. Trochim, Kane, Graham, & Pincus, 2011) | Yes / NoŦ | Qualitative |
| 29 | Demonstration of an efficient way of treatment | (Lavis et al., 2003; W. Trochim et al., 2011; Woolf, 2008) | Yes / NoŦ | Qualitative |
| 30 | Development of new research devices or products for better results | (ARC, 2018; Kalucy et al., 2009; Lavis et al., 2003; Mankoff et al., 2004; Pang et al., 2003) | Yes / NoŦŦ | Mixed |
| 31 | Obtaining patents for new devices or products | (ARC, 2018; Kuruvilla et al., 2006; Lavis et al., 2003; Lewison, 2003; Sarli, Dubinsky, & Holmes, 2010) | How many patents are obtained? | Quantitative |
| 32 | Identification or validation of new biomarkers for better healthcare | (Lavis et al., 2003; Zerhouni, 2007) | Yes / NoŦ | Qualitative |
| 33 | Use of research outcomes and discoveries in the advancement of research related to animals and humans | (Pober et al., 2001; Woolf, 2008; Zerhouni, 2007) | Yes / NoŦ | Qualitative |
| 34 | Receiving an award for research | (Kuruvilla et al., 2006) | How many awards are received? | Quantitative |
| 35 | The increment in the number and proportion of research grant submissions and awards | (ARC, 2018; Lavis et al., 2003; Lewison, 2003; Weiss, 2007) | What is the proportion of success of grant award? | Quantitative |
| 36 | Increase in the number of publications in high-ranking journals as a research outcome | (Buxton & Hanney, 1996; Kuruvilla et al., 2006; Lewison, 2003; Pang et al., 2003; Weiss, 2007) | How many publications are produced in high ranking journals? ŦŦŦ | Quantitative |
| 37 | Increase in the total impact factor gained by publishing research in high-ranking journals | (ARC, 2018; Archambault & Lariviere, 2009; RAND Europe, 2006; Weiss, 2007) | How much impact factor is gained? ŦŦŦ | Quantitative |
| 38 | Increase in the conference papers and presentations organised on national or international levels. | (ARC, 2018; Kalucy et al., 2009; Lewison, 2003) | How many conference papers and presentations are produced? ŦŦŦ | Quantitative |
| 39 | Increase in the number of citations of research outcome | (ARC, 2018; Garfield, 2006; S. R. Hanney et al., 2004; Kuruvilla et al., 2006; RAND Europe, 2006; Weiss, 2007) | How many citations are obtained? ŦŦŦ | Quantitative |
| 40 | Increase in media appearance of researchers or research organisations for their findings and its relation to the public | (Kuruvilla et al., 2006; Lewison, 2003) | How many times appeared in media? | Quantitative |
| 41 | Popularity and acceptance of research-based knowledge and techniques in masses (e.g. change in community-based health practice or education system) | (Kalucy et al., 2009; Kuruvilla et al., 2006; Lewison, 2003; Pang et al., 2003; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 42 | Participation of researchers as a member of the research journal editorial board or becoming a journal editor | (Kuruvilla et al., 2006) | Yes / NoŦ | Qualitative |
| 43 | Dissemination and reach of research outcome to more audiences | (Kalucy et al., 2009; Kuruvilla et al., 2006; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 44 | IF2-Index | (Boell & Wilson, 2010) | Index Value ŦŦŦ | Quantitative |
| 45 | h-Index | (Hirsch, 2005) | Index Value ŦŦŦ | Quantitative |
| 46 | Contemporary h-Index | (Sidiropoulos, Katsaros, & Manolopoulos, 2007) | Index Value ŦŦŦ | Quantitative |
| 47 | Individual h-Index | (Harzing, 2010) | Index Value ŦŦŦ | Quantitative |
| 48 | Hi-Index | (Zhai, Yan, & Zhu, 2013) | Index Value ŦŦŦ | Quantitative |
| 49 | H2-Index | (Vanclay & Bornmann, 2012) | Index Value ŦŦŦ | Quantitative |
| 50 | M-Quotient | (Hirsch, 2005) | Index Value ŦŦŦ | Quantitative |
| 51 | G-Index | (Egghe, 2006) | Index Value ŦŦŦ | Quantitative |
| 52 | Y-Index | (Fu & Ho, 2014) | Index Value ŦŦŦ | Quantitative |
| 53 | PRP-Index | (Vinkler, 2014) | Index Value ŦŦŦ | Quantitative |
| 54 | IFQ2A index | (Torres-Salinas, Moreno-Torres, Delgado-López-Cózar, & Herrera, 2011) | Index Value ŦŦŦ | Quantitative |
| 55 | DCI-Index | (Järvelin & Persson, 2008) | Index Value ŦŦŦ | Quantitative |
| 56 | R-& AR-Indices | (Jin, Liang, Rousseau, & Egghe, 2007) | Index Value ŦŦŦ | Quantitative |
| 57 | AHP Index | (Wang, Wen, & Liu, 2016) | Index Value ŦŦŦ | Quantitative |
| 58 | Altmetric | (A. E. Williams, 2017) | Altmetric Attention Score | Quantitative |
| 59 | STAR Metrics | (Largent & Lane, 2012) | Index Value | Quantitative |
| 60 | ResearchGate-Score | (Hoffmann, Lutz, & Meckel, 2016) | Index Value ŦŦŦ | Quantitative |
| 61 | Crown indicator | (Moed, De Bruin, & Van Leeuwen, 1995) | Index Value ŦŦŦ | Quantitative |
| 62 | Societal Quality Score | (Mostert, Ellenbroek, Meijer, van Ark, & Klasen, 2010) | Index Value | Quantitative |
| 63 | PlumX Metrics | (Lindsay, 2016) | Index Value ŦŦŦ | Quantitative |
| 64 | Positive reviews of creative publications and performances | (Grant, Brutscher, Kirk, Butler, & Wooding, 2010) | Yes / NoŦ | Qualitative |
| 65 | Non-academic publications in government reports | (Penfield, Baker, Scoble, & Wykes, 2014) | How many publications are done in government reports? | Quantitative |
| 66 | Non-academic citations in government reports | (Penfield et al., 2014) | How many citations are made in government reports? | Quantitative |
| 67 | Number of industrial contracts | (ARC, 2018) | How many industrial contracts are obtained? | Quantitative |
| 68 | Amount of industrial and academic funding | (ARC, 2018) | How much funding is secured? | Quantitative |
| 69 | Community awareness of research; Collaborative projects with end users | (S. Hanney et al., 2007) | Yes / NoŦ | Qualitative |
| 70 | Facilitation and participation in expert panels for research enquiries, external institution; steering committees, and advisory boards | (S. Hanney et al., 2007) | Yes / NoŦŦ | Mixed |
| 71 | Use of research outcomes, discoveries or clinical trials as a best practice | (Lewison, 2003; W. M. Trochim et al., 2008; Woolf, 2008) | Yes / NoŦ | Qualitative |
| 72 | Use of research outcome in efficiency and better performance of services | (Woolf, 2008) | Yes / NoŦ | Qualitative |
| 73 | Provision of diversified and efficient intervention and treatment options for clinicians | (Dougherty & Conway, 2008) | Yes / NoŦ | Qualitative |
| 74 | Improved client care | (Heller & de Melo-Martín, 2009; Kuruvilla et al., 2006; Mankoff et al., 2004; Pang et al., 2003; Pober et al., 2001; W. Trochim et al., 2011; Weiss, 2007; Westfall et al., 2007) | Yes / NoŦ | Qualitative |
| 75 | The decrease in events of work-environment mistakes | (Donaldson, Rutledge, & Ashley, 2004) | What is the decrease rate of work-environment mistakes? | Quantitative |
| 76 | Increase in the provision of training in healthcare improvement from the healthcare providers to the support staff | (S. R. Hanney et al., 2004; Mankoff et al., 2004; Pober et al., 2001; Sung et al., 2003) | How many support staff are trained? | Quantitative |
| 77 | Improvement in technologies and information systems for social applications | (B. Haynes & A. Haines, 1998; Kuruvilla et al., 2006) | Yes / NoŦ | Qualitative |
| 78 | Increase in training development for system improvement | (S. R. Hanney et al., 2004; Kuruvilla et al., 2006; Lewison, 2003; Mankoff et al., 2004; Pober et al., 2001; Sung et al., 2003) | How many trainings are developed for healthcare improvements? | Quantitative |
| 79 | Creation of prevention methods for clinical practice | (Heller & de Melo-Martín, 2009; Kuruvilla et al., 2006; Mankoff et al., 2004; Pang et al., 2003; Pober et al., 2001; W. Trochim et al., 2011; Weiss, 2007; Westfall et al., 2007) | Yes / NoŦ | Qualitative |
| 80 | Adapting evidence-based practices | (Donaldson et al., 2004; Dougherty & Conway, 2008; Grant, Cottrell, Cluzeau, & Fawcett, 2000; Kuruvilla et al., 2006; Westfall et al., 2007) | Yes / NoŦ | Qualitative |
| 81 | Improvement in patient outcomes | (Donaldson et al., 2004; Dougherty & Conway, 2008; Lewison, 2003; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 82 | Improvement in health behaviours and enthusiasm of patients and general masses | (Kuruvilla et al., 2006; Lewison, 2003; Woolf, 2008) | Yes / NoŦ | Qualitative |
| 83 | Development and promulgation of guidelines and policies | (Dougherty & Conway, 2008; Grant et al., 2000; S. R. Hanney et al., 2004; Brian Haynes & Andrew Haines, 1998; Kuruvilla et al., 2006; Lewison, 2003; Pang et al., 2003; W. Trochim et al., 2011) | Yes / NoŦ | Qualitative |
| 84 | Progress in personal circumstances-based healthcare e.g. based on genetic sequencing | (Mankoff et al., 2004; Zerhouni, 2007) | Yes / NoŦ | Qualitative |
| 85 | Strengthening of service-client relationship | (Woolf, 2008) | Yes / NoŦ | Qualitative |
| 86 | Research outcome translation into medical practice for improvement | (Dougherty & Conway, 2008; Kessler & Glasgow, 2011) | Yes / NoŦ | Qualitative |
| 87 | Strengthening human protection through improved policies and better procedures | (Weiss, 2007) | Yes / NoŦ | Qualitative |
| 88 | Improvement in regulation for introducing advanced technologies, tools and techniques | (Lewison, 2003) | Yes / NoŦ | Qualitative |
| 89 | Compliance with ethical guidelines in research | (Kuruvilla et al., 2006; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 90 | Development of community-based awareness | (Sarli et al., 2010) | Yes / NoŦ | Qualitative |
| 91 | Betterment of policies, guidelines and reimbursement systems for service providers | (Sarli et al., 2010) | Yes / NoŦ | Qualitative |
| 92 | Increased empowerment of service users | (Kuruvilla et al., 2006) | Yes / NoŦ | Qualitative |
| 93 | Support of research outcomes and information for political decision and policymaking | (Buxton & Hanney, 1996; B. Haynes & A. Haines, 1998; Kalucy et al., 2009; Pang et al., 2003) | Yes / NoŦ | Qualitative |
| 94 | Improved public awareness about the environment and culture, Public behaviour change and advocacy; Increased literacy and numeracy rates | (Grant et al., 2010; Raftery et al., 2016) | Yes / NoŦ | Qualitative |
| 95 | Improvement in health literacy of health users and patients | (Kuruvilla et al., 2006; Pang et al., 2003) | Yes / NoŦ | Qualitative |
| 96 | Improvement in the health status of health users and patients | (Dougherty & Conway, 2008; Kuruvilla et al., 2006; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 97 | Establishment of public health, education or any other social schemes for a region | (Woolf, 2008) | Yes / NoŦ | Qualitative |
| 98 | The decrease in social disparities | (Heller & de Melo-Martín, 2009; Kuruvilla et al., 2006; Zerhouni, 2007) | Yes / NoŦ | Qualitative |
| 99 | Improvement in inter-organizational coordination for betterment in the social sector | (Sarli et al., 2010) | Yes / NoŦ | Qualitative |
| 100 | Increase in planning efforts and program implementation related to social issues | (Heller & de Melo-Martín, 2009; Woolf, 2008) | Yes / NoŦ | Qualitative |
| 101 | Improvement in health user health research | (Weiss, 2007) | Yes / NoŦ | Qualitative |
| 102 | Increased empowerment and knowledge of health users about health issues | (Kuruvilla et al., 2006; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 103 | Better communication and perception of health users about health risks | (Kuruvilla et al., 2006; Pober et al., 2001; Weiss, 2007) | Yes / NoŦ | Qualitative |
| 104 | Expansion of health education, literacy and other social advantages | (Kuruvilla et al., 2006) | Yes / NoŦ | Qualitative |
| 105 | Improvement in Occupational Health and Safety Environment | (Raftery et al., 2016; V. Williams, Eiseman, Landree, & Adamson, 2009) | Yes / NoŦ | Qualitative |
| 106 | Disuse the law for obsoleting the existing method of drug approval | (Maliha, 2018) | Yes / NoŦ | Qualitative |
| 107 | Commercialisation of new discoveries, product or technology | (Kuruvilla et al., 2006; Lavis et al., 2003; Woolf, 2008) | Yes / NoŦ | Qualitative |
| 108 | Improvement in cost-reducing techniques and effectiveness | (Kuruvilla et al., 2006) | Yes / NoŦ | Qualitative |
| 109 | Improvement in economic gains such as increased employment, health cost cut | (Aries & Sclar, 1998; S. R. Hanney et al., 2004; Kalucy et al., 2009; Kuruvilla et al., 2006; RAND Europe, 2006; Weiss, 2007) | Yes / NoŦŦ | Mixed |
| 110 | Development of new job opportunities and growth in the specific economic sector or geographical region | (Aries & Sclar, 1998) | Yes / NoŦŦ | Mixed |
| 111 | Development of medicinal products and therapeutic procedures | (S. Hanney et al., 2007; Sarli et al., 2010) | How many products or procedures are developed? | Quantitative |
| 112 | Improvement in a business environment, commercialisation, technology incubation, products and processes | (Buxton & Hanney, 1996) | Yes / NoŦ | Qualitative |
| 113 | Reduction in work loss due to illness and increased benefits from a healthy workforce | (CAHS, 2009) | Yes / NoŦ | Qualitative |
| 114 | Increased Royalties, employment, and Licences; creative works commissioned | (Grant et al., 2010) | Yes / NoŦŦ | Mixed |
| 115 | Creation of new knowledge about sustainable development and environmental protection for a better future for the world | (Kuruvilla et al., 2006) | Yes / NoŦ | Qualitative |
| 116 | Improved environmental quality and sustainability | (Engel-Cox, Van Houten, Phelps, & Rose, 2008) | Yes / NoŦ | Qualitative |
| 117 | Reduced emissions; regeneration or arrested degradation of natural resources | (Raftery et al., 2016) | Yes / NoŦŦ | Mixed |
| 118 | Improved awareness of environmental impacts and legislation for protection | (CAHS, 2009) | Yes / NoŦ | Qualitative |
| 119 | development of mitigation methods for reducing environmental hazards and losses from natural disasters | (Grant et al., 2010) | Yes / NoŦŦ | Mixed |

Ŧ In the case of Yes, description and justification are needed.

ŦŦ In the case of Yes, a detailed case study with quantitative evidence is needed.

ŦŦŦ Bibliometric indicator.

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