**RESEARCH AND SOCIETAL IMPACT INDICATORS**

**WHERE DOES YOUR INSTITUTION STAND?**

Assessment of Research Impact model is a list of indicators to document evidence of scientific research impact. The indicators are organized under the following pathways:

• Research Output and Activities

• Advancement of Knowledge

• Community Benefit

• Legislation and Policy

• Economic Benefit

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| **RESEARCH OUTPUTS AND ACTIVITIES** | **Research Outputs and Activities** are products and/or activities resulting from basic or applied scientific research. |
| **Indicators** | **Examples** |
| **Conferences or Meetings or Symposia or Lectures** | Conference papers resulting from research study in your institution.  Conference posters resulting from research study in your institution.  Panel discussions resulting from research study in your institution.  Presentations submitted by members of a research team in your institution in response to a Call for Papers issued by organizers of a meeting or conference.  Presentations given by members of a research team in your institution in response to a written invitation issued by organizers of a meeting or conference.  Lecture provided by research investigators from your institution.  Supplemental materials provided by research investigators from your institution.  Meetings or symposia are organized and held by research investigators from your institution. |
| **Data (public or restricted)** | Research data generated by research team in your institution.  Research data is deposited into a shared repository.  Metadata from research data is shared with other parties.  Supplemental materials are deposited into a shared repository. |
| **Databases or Repositories** | Database or repository resulting from research study in your institution. |
| **Diagnostic Techniques and Procedures** | Diagnostic application for identification of a disease, disorder or condition developed as a result of research study in your institution.  Screening tool for identification of a disease, disorder or condition developed as a result of research study in your institution. |
| **Funding** | Research team from your institution invited to submit a funding application from a funding body.  Research study secures funding. |
| **Gray Literature Materials** | Non peer-reviewed journal articles or report or other publication resulting from research in your institution.  Trade publications resulting from the research studies in your institution.  Supplemental materials that supplement a publication (published or unpublished).  Slides, videos or other materials resulting from research study in your institution. |

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| **RESEARCH OUTPUTS AND ACTIVITIES** | Research Outputs and Activities are products and/or activities resulting from basic or applied scientific research. |
| **Indicators** | Examples |
| **Invention Disclosures** | Invention disclosures reported to the university/organization as a result of research study. License agreements or patents may be executed for inventions deemed to be of potential commercial value. Examples of inventions are:   * Diagnostic product * Therapeutic product * Measurement instrument * Computer software |
| **License Agreements** | License agreement executed for invention or intellectual property generated by research study. |
| **Measurement Instruments** | Measurement instrument developed as a result of research study. |
| **Media Releases, Appearances or Interviews** | News releases issued by research study or affiliate organization.  Media appearances or interviews involving the research investigators.  Research study is profiled in a publication published by the institution. |
| **Medical Devices** | Medical device or prototype developed as a result of research study. |
| **Mobile Applications** | Mobile application developed by research study. |
| **Outreach Efforts** | Research investigators invited to provide a presentation based on research findings to the public.  Research investigators invited to provide a presentation at a non-professional conference.  Research investigators meet with policy-makers and other stakeholders to review research findings. Number of attendees at outreach visits.  Other types of outreach activities. |
| **Patents** | Patent executed for invention generated by research study. |
| **Peer-Reviewed Journal Articles** | Peer-reviewed journal articles resulting from research study. |
| **Pharmaceutical Preparations** | Potential new drug identified as a result of research study. |
| **Research Methodologies** | Algorithm resulting from research study in your institution.  Conceptual framework resulting from research study in your institution.  Scientific analysis method resulting from research study in your institution.  New approach for researching a disease, disorder or condition resulting from research study. Novel use of technology resulting from research study in your institution.  Theoretical construct resulting from research study in your institution. |

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| **Indicators** | Examples |
| **Social Media Applications** | Social media accounts (Twitter, blogs, Facebook, etc.) utilized by research study to disseminate results about research study.  Research investigators create a You Tube video about research study.  Research investigators create a Wikipedia or other wiki entry based on research study. |
| **Software Applications** | Software resulting from research study (alpha or beta). |
| **Trainees or Scholars** | Trainees or scholars involved in research study. |
| **Training Materials** | Training materials developed as a result of research study.  Best practices guidance document developed as a result of research study. |
| **Website of Research Study** | Website developed for research study. |

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| **ADVANCEMENT OF KNOWLEDGE** | **Advancement of Knowledge** represents research outputs and/or activities that contribute to the scholarly record. |
| **Indicators** | Examples |
| **Books or Book Chapters** | Book or book chapters generated by research study is noted in a bibliography.  Number of libraries that own the book generated by research study.  Book is used as a textbook for higher education.  Subsequent editions of the book or book chapters.  Book is reviewed by a scholarly journal. Translations of the book.  Book awarded prizes such as the PROSE Award or noted by an organization as having made a significant contribution to a field.  Book noted on a publisher’s best-seller list.  Book or book chapter cited in subsequent publications.  Book publicly recommended on Google+. |
| **Change in Understanding and**  **Awareness** | Author invited to present on the topic related to the book or book chapter.  Research study findings represent a paradigm shift in a field.  Research study findings lead to change in understanding a problem.  Research study findings expand the knowledge in a field. |
| **Citations to Publications** | Research study findings lead to a new approach to disease, disorder or condition.  Publications generated by research study are cited in a subsequent reference including journal articles, books, book chapters, gray literature, dissertations, patents, web sources, and/or data records.   * Number of first generation citations. * Number of second generation citations. * Countries represented by citations. |
| **Conferences** | Conference theme is organized around the topic related to research study.  Conference panel is created around the topic related to research study.  Research study findings are cited in a presentation. |
| **Collaborations/Partnerships** | Research study collaborations that continue after completion of a research study within the university or outside of the university.  Research study results in new collaborative relationship after completion of a research study within the university or outside of the university.  Research study members are invited to collaborate on a new research study within the university or outside of the university.  Collaborative relationships can be classified in a number of ways:  **Type of collaboration?**   * Number of collaborations * Number of departments or disciplines represented * Number of institutions represented   **Duration?**  **Type of partner?**   * Community * Private/Foundation * Industry * University * Government   **Geographic location of the partner?**   * Local * International   **Type of partnership?**   * Multidisciplinary (Researchers from different disciplines work independently on a research study to address a research issue). * Transdisciplinary (Researchers from different disciplines collaborate on a research study using a shared framework to address a research issue). * Interdisciplinary (Researchers from different disciplines collaborate on a project using their discipline-specific perspective to address a research issue). |

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| **ADVANCEMENT OF KNOWLEDGE** | **Advancement of Knowledge** represents research outputs and/or activities that contribute to the scholarly record. |
| **Indicators** | Examples |
| **Consensus Development Conferences** | Research study cited in a Consensus Development Conference. |
| **Curriculum Guidelines/Materials** | Curriculum guideline refers to research study as being significant or for use as recommended or background readings for more information.  Research study findings are cited in teaching materials. |
| **Data** | Research data is deposited into a repository.  Research data created by research study are reused and/or cited by other parties. |
| **Gray Literature** | Research study findings are noted in a trade publication, government documents, industry reports, public policy documents or other publications.  Research study findings are noted by a funding agency. |
| **Licenses** | License is granted to outside parties for use of intellectual property or invention generated by research study. Examples of licenses include:   * Evaluation and Option Agreement. * Non-Exclusive License Agreement. * Exclusive License Agreement. |
| **Mass Media** | Mass media publication or broadcast refers to research study. Research investigators are interviewed by the media. |
| **Material Transfer Agreements (MTA)** | MTA is granted for transfer of tangible property generated by research study. |
| **Meta-Analyses** | Research study is cited in a meta-analysis. |
| **Institute or Center** | New institute or center is formalized as a result of a research study. |
| **Partnership/Collaboration** | New partnership or collaboration formed as a result of a research study. |
| **Research Direction** | Research study findings lead to new direction and/or area of research. |
| **Research Field or Discipline** | Research study findings lead to new field of research or discipline. |
| **Outreach Efforts** | Research study investigators receive feedback as a result of an outreach effort. |

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| **ADVANCEMENT OF KNOWLEDGE** | **Advancement of Knowledge** represents research outputs and/or activities that contribute to the scholarly record. |
| **Indicators** | Examples |
| **Proof of Concept (POC)** | An experimental scientific method or innovation demonstrates feasibility in a pilot study. |
| **Publication Metrics** | Publication generated by research study accessed/viewed online. (Publications include journal articles, books, book chapters, slides, software, conference papers, data sets, videos, supplemental materials, etc.).  Publication generated by research study downloaded.  Publication generated by research study is assigned a ranking factor by a reviewer based on significance of research study.  Publication generated by research study is awarded a “Best Paper” award by a publisher.  Publication generated by research study is reviewed by [Facultyof1000.](http://f1000.com/)  Publication generated by research study is noted as a Breakthrough of the Year in [AAA Science Magazine.](http://www.sciencemag.org/)  Publication generated by research study is noted as a Top Scientific Discovery in [Wired.](http://www.wired.com/)  Publication generated by research study is noted in “Data and Rankings” in [Science Watch.](http://sciencewatch.com/dr/)  Author/s in publication generated by research study is noted in “Data and Rankings” in [Science Watch.](http://sciencewatch.com/dr/)  Publication generated by research study is noted as a [SciVerse ScienceDirect Top 25.](http://top25.sciencedirect.com/)  Publication generated by research study is noted as a Hot Paper in [Essential Science Indicators.](http://thomsonreuters.com/products_services/science/science_products/a-z/essential_science_indicators/)  Publication generated by research study is noted as a Core Paper in [Essential Science Indicators.](http://thomsonreuters.com/products_services/science/science_products/a-z/essential_science_indicators/)  Publication generated by research study is noted as a Highly Cited Paper in [Essential Science Indicators.](http://thomsonreuters.com/products_services/science/science_products/a-z/essential_science_indicators/)  Research study itself is referred to in a publication without a reference. |
| **Reprint Requests** | Requests for reprints (print or electronic) for journal articles generated by research study. |
| **Requests for Information** | Physicians, policy makers or consumers contact research study investigators for more information on research findings. |
| **Research Methodologies** | Research methodologies developed by research study are used by others. Examples include:   * Scientific analysis method. * Conceptual framework. * Algorithm. |
| **Research Practice** | Research study leads to change in bench or clinical research practices. |
| **Research Studies/Ancillary** | Ancillary research study generated as a result of research study.   * Dollar amount of the new research study. * Duration of the new research study. * Type of funding sources. * Full time employees. |
| **Research Studies/New** | New research study generated as a result of research study.  New pilot award generated as a result of research study findings.   * Dollar amount of the new research study. * Duration of the new research study. * Type of funding sources. * Full time employees. |
| **Research Studies/Renewed** | Research study is renewed.   * Dollar amount of the new research study. * Duration of the new research study. * Type of funding sources. * Full time employees. |
| **Reviews** | Research study cited in a review. |

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| **ADVANCEMENT OF KNOWLEDGE** | **Advancement of Knowledge** represents research outputs and/or activities that contribute to the scholarly record. |
| **Indicators** | Examples |
| **Social Media Applications** | Publication generated by research study is referred to or cited in a blog, tweet, wiki, or other non-traditional mode of dissemination. (Publications include journal articles, books, book chapters, slides, software, conference papers, data sets, videos, supplemental materials, etc.).  Publication generated by research study accessed/viewed online.  Publication generated by research study downloaded.  Publication generated by research study is bookmarked by online reference managers.  Comments, notes, recommendations and/or rankings are added by readers to a publication generated by a research study.  Video about research study is viewed or recommended by others.  Wiki entry (based on research study) is publicly edited. |
| **Software Applications** | Software applications developed by research study are used by others. |
| **Subject Headings/Thesauri** | New subject heading or thesauri term or phrase resulting or related to research study is established. |
| **Systematic Reviews** | Research study is cited in a systematic review. |
| **Trainees/Scholars** | For some research studies, trainees or scholars are involved with research. Examples of outcomes related to the training/education received are:   * Trainees or scholars receive advanced degrees. * Trainees or scholars continue research at different institutions. * Trainees or scholars receive grant award funding for research. * Trainees or scholars engage in translational research. |
| **Training Materials** | Training materials created by research study are used or adapted by others. |
| **Website of Research Study/ Usage** | Some investigators have websites devoted to a research study. Examples of metrics related to the website include:   * Number of page views. * Number of unique and returning visitors. * Origin of site visitors by country. * Time spent on site. * Requests from the public for more information. * Requests from health care providers and researchers for more information. * Other web-based metrics. |

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| **COMMUNITY BENEFIT** | **Community Benefit** is theenhancement of well-being to the community as a result of research outputs and/or activities. |
| **Indicators** | Examples |
| **Awareness and Identification of Risk Factors** | Research study findings lead to public awareness of risk factors of a disease, disorder, condition or behavior. Research study findings lead to identification of risk factors of a disease, disorder, condition or behavior. |
| **Consumer Health Information** | Research study findings result in patient decision materials to assist with healthcare decision-making. Research study findings are cited in materials for patients or the public. |
| **Health Care Quality Access and Evaluation** | Research study findings result in increased performance, quality, and consistency in the delivery of health care services. |
| **Health Promotion** | Research study findings leads to enhancement of health promotion activities among community members. |
| **Lifestyle Intervention** | Research study findings leads to identification of a lifestyle intervention. |
| **Measurement Instruments** | Measurement instrument generated by research study used by consumers. |
| **Partnerships** | Research study forms partnership with Community or other group to address a community-based need. |
| **Pharmaceutical Preparations** | Drug generated by research study used by consumers. |
| **Private Healthcare Benefit Plans** | Research study cited in private insurance benefit plan in support of coverage. |
| **Public Healthcare Benefit Plans** | Research study cited in a public insurance benefit plan in support of coverage. |
| **Standard of Care** | Research study findings result in clinically effective approach in the standard of care for a disease, disorder or condition. |

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| **LEGISLATION AND POLICY** | **Legislation and Policy** represents codification of research outputs and/or activities into public law, guidelines, standards or policy. |
| **Indicators** | Examples |
| **Committee Participation** | Research study members invited to serve on advisory boards.  Research study members invited to serve on committees for policy development. |
| **Guidelines** | Research study cited in development of guidelines issued by organizations. |
| **Legislation/Regulations** | Research study cited in enactment of federal, state or local legislation or regulation. |
| **Policy** | Research study cited in enactment of federal, state or local policy.  Research study cited in enactment of non-governmental policy.  Policy-making organizations report that research findings resulted in change in policy. |
| **Standards** | Research study cited in enactment of standards such as American National Standards Institute (ANSI) or the International Standard Organization (ISO). |
| **Testimony/Witness** | Testimony based on research outputs and/or activity is presented before a legislative body. |

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| **ECONOMIC BENEFIT** | Economic Benefit represents economic outcomes as a result of research outputs and/or activities. |
| **Indicators** | Examples |
| **Costs Savings** | Research study findings result in reduced costs in the delivery of health care services. |
| **Cost-Effectiveness** | Research study findings result in a cost-effective intervention for a disease, condition or disorder. |
| **Disease Prevention/Eradication** | Research study findings lead to identification of measures for disease prevention. Research study findings lead to eradication of a disease. |
| **Health Resources** | Research study findings result in enhancement of existing resources and expertise. |
| **Quantity and Quality of Life** | Research findings result in a treatment or intervention that is judged as being clinically effective. Patients self-report increase in quality of life. |
| **Quality of Healthcare Services** | Research study findings result in increased performance, quality, and consistency in the delivery of health care services. |
| **License Agreements** | Revenue generated from granting of licensing to outside parties for use of intellectual property or invention generated by research study. Examples of licenses include:   * Number of licenses granted. * Requestor status, individual or organization. * Purpose. * Translations, if applicable. * Adaptations, if applicable. |
| **Life Expectancy** | Research study findings result in increased life expectancy. |
| **Morbidity and Mortality** | Research findings result in reduction of disease burden.  Research findings result in reduction of morbidity.  Research findings result in reduction of mortality.  Research findings results in reduction of prevalence of a disease, disorder or condition.  Research findings result in reduction of incidence of a disease, disorder or condition. |
| **Pharmaceutical Preparations** | Drug generated by research study results in a cost-effective means of management of a disease, disorder or condition. |
| **Research Project/Ancillary** | Ancillary research study generated as a result of research study.   * Dollar amount of the new research study. * Duration of the new research study. * Type of funding sources. * Full time employees. |
| **Research Projects/New** | New funded research studies generated as a result of research study.   * Dollar amount of the new research study. * Duration of the new research study. * Type of funding sources. * Full time employees. |
| **Research Projects/Renewed** | Renewed research studies generated as a result of research study.   * Dollar amount of the new research study. * Duration of the new research study. * Type of funding sources. * Full time employees. |
| **Spin-off Company** | Spin-off company formed as a result of research study.   * Revenue generated. * Duration of spin-off. * Value at termination of spin-off company. * Number of employees hired. |
| **Start-up Company** | Start-up company formed as a result of research study.   * Revenue generated. * Number of employees hired. |