Annex 2: Broad fields of science

Adapted from the Science-Metrix Classification of Scientific Journals (v. 1.06)*

In order to generate statistics on scientific publications by broad field of science, the existing Science-Metrix classification of 174 subfields was regrouped in the 11 broad fields listed on the following page.

Some 38 of Science-Metrix's subfields were discarded from the full bibliometric study conducted by Science-Metrix because they classified papers from social sciences and the humanities that included fields such as linguistics, law or business. These papers were not covered by the *UNESCO Science Report*, in order to ensure greater homogeneity within fields and, thereby, facilitate comparisons between countries.

The broad field of cross-cutting technologies has been split into 10 subcategories. The three categories of artificial intelligence and robotics, blockchain technology and the Internet of Things did not align with the existing subfields* based on journal-level classification, so were created by manually assembling lists of journals principally covering those themes using a keyword-based approach. Journals identified as being mainly focused on one of these themes were removed from their original subfield to ensure that all broad fields were mutually exclusive.

It is important to note that all of these subfields are defined at the journal level. For example, this means that an article on robotics published in a more general journal on information and communication technologies would not be counted towards the AI and robotics dataset. The only exceptions are generalist journals, such as *Nature* or *Science*, which cannot be accurately assigned to a single subfield. Articles from such journals were instead assigned a subfield at the article level by using a machine-learning algorithm.

In graphics within chapters, percentage shares of broad fields of science have been rounded. This means that values of 0.5% and over have been rounded up to 1% and those accounting for less than 0.5% of total output have been excluded.

The composition of each broad field of science by subfield can be found on the following page.

For additional details of the bibliometric research, please see the methodological note at the end of Table E1.

Composition of each broad field of science by subfield

Agricultural sciences
- Agronomy and agriculture
- Dairy and animal science
- Fisheries
- Food science
- Forestry
- Horticulture
- Veterinary sciences

Biological sciences
- Entomology
- Evolutionary biology
- Marine biology and hydrobiology
- Ornithology
- Plant biology and botany
- Zoology

Built environment and design
- Architecture
- Building and construction
- Design practice and management
- Urban and regional planning

Chemistry
- Analytical chemistry
- General chemistry
- Inorganic and nuclear chemistry
- Medicinal and biomolecular chemistry
- Organic chemistry
- Physical chemistry
- Polymers

Cross-cutting strategic technologies
- Artificial intelligence and robotics
- Bioinformatics
- Biotechnology
- Blockchain technology
- Energy
- Internet of Things
- Materials
- Nanoscience and nanotechnology
- Optoelectronics and photonics
- Strategic, defence and security studies**

Engineering
- Aerospace and aeronautics
- Automobile design and engineering
- Biomedical engineering
- Chemical engineering
- Civil engineering
- Electrical and electronic engineering
- Environmental engineering
- Geological and geomatics engineering
- Industrial engineering and automation
- Mechanical engineering and transport
- Mining and metallurgy
- Operations research

Environmental sciences (excl. geosciences)
- Ecology
- Hydrology (excluding hydrobiology and hydrogeology)
- Meteorology and atmospheric sciences
- Oceanography

Geosciences
- Geology
- Geochemistry and geophysics
- Hydrogeology
- Palaeontology

Health sciences
- Allergy
- Anatomy and morphology
- Anaesthesiology
- Arthritis and rheumatology
- Behavioural science and comparative psychology
- Biochemistry and molecular biology
- Biophysics
- Cardiovascular system and haematology
- Clinical psychology
- Complementary and alternative medicine
- Dentistry
- Dermatology and venereal diseases
- Developmental and child psychology
- Developmental biology
- Emergency and critical care medicine
- Endocrinology and metabolism
- Environmental and occupational health
- Epidemiology
- Experimental psychology
- Gastroenterology and hepatology
- General and internal medicine
- General clinical medicine
- General psychology and cognitive sciences
- Genetics and heredity
- Geriatrics
- Gerontology
- Health policy and services
- Human factors
- Immunology
- Legal and forensic medicine
- Microbiology
- Microscopy
- Mycology and parasitology
- Neurology and neurosurgery
- Nuclear medicine and medical imaging
- Nursing
- Nutrition and dietetics
- Obstetrics and reproductive medicine
- Oncology and carcinogenesis
- Ophthalmology and optometry
- Orthopaedics
- Otorhinolaryngology
- Pathology
- Paediatrics
- Pharmacology and pharmacy
- Physiology
- Psychiatry
- Psychoanalysis
- Public health
- Rehabilitation
- Respiratory system

Health sciences (continued)
- Social psychology
- Speech-language pathology and audiology
- Sport sciences
- Substance abuse
- Surgery
- Toxicology
- Tropical medicine
- Urology and nephrology
- Virology

ICTs, maths and statistics
- Applied mathematics
- Computation theory and mathematics
- Computer hardware and architecture
- Distributed computing
- General mathematics
- Image processing
- Information systems
- Medical informatics
- Networking and telecommunications
- Numerical and computational mathematics
- Statistics and probability

Physics and astronomy
- Acoustics
- Applied physics
- Astronomy and astrophysics
- Chemical physics
- Fluids and plasmas
- General physics
- Mathematical physics
- Nuclear and particle physics
- Optics