

The Health Benefits of ISO Standards: Contemporary Research



International
Organization for
Standardization



SUSTAINABLE
DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD



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COVID-19

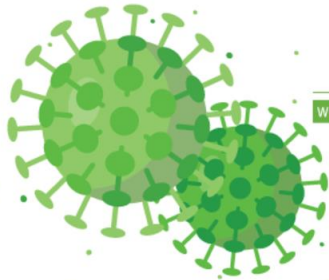
Disease caused by the SARS-CoV-2 virus



Novel coronavirus

Coronaviruses are viruses that circulate among animals but some of them are also known to affect humans.

The 2019 novel coronavirus was identified in China at the end of 2019 and is a new strain that has not previously been seen in humans.



Symptoms

- FEVER
- COUGH
- DIFFICULTY BREATHING
- MUSCLE PAIN
- TIREDDNESS

Prevention

When visiting affected areas

Avoid contact with sick people

Wash your hands with soap and water

If you develop cough, use a medical face mask

Wherever you travel apply general hygiene rules

Transmission

VIA RESPIRATORY DROPLETS

2-14 days
estimated incubation period



ecdc.europa.eu/en/novel-coronavirus-china



SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



The pandemic brought a significant number of wide-ranging challenges across the world.

Importance of the United Nations 17 Sustainable Development Goals (SDGs) which, through their targets, have the power to affect most aspects of people's lives.

A Foundation of Standards

BS ISO/IEC 15504

The concepts of process assessment and its use in process improvement and process capability determination

ISO/IEC TS 17021-4:2013

Conformity assessment - Requirements for bodies providing audit and certification of management systems

ISO 19011:2011

Guidelines for auditing management systems.

ISO/IEC 17065

Conformity assessment – Requirements for bodies certifying products, processes, and services.

ISO 10006:2006

Quality management systems - Guidelines for quality management in projects



ISO 14000 Series

14001: Environmental Management Systems
14004: EMS General Guidelines

14010: Guidelines for Auditing of an EMS
14012: Auditing - Qualification Criteria

ISO 20121:2012

specifies requirements for an event sustainability management system for any type of event or event-related activity and provides guidance on conforming to those requirements

ISO 21500:2012

Guidance on Project Management

ISO 9000 Series

ISO 9001:2008 - sets out the requirements of a quality management system

ISO 9000:2005 - covers the basic concepts and language

ISO 9004:2009 - focuses on how to make a quality management system more efficient and effective

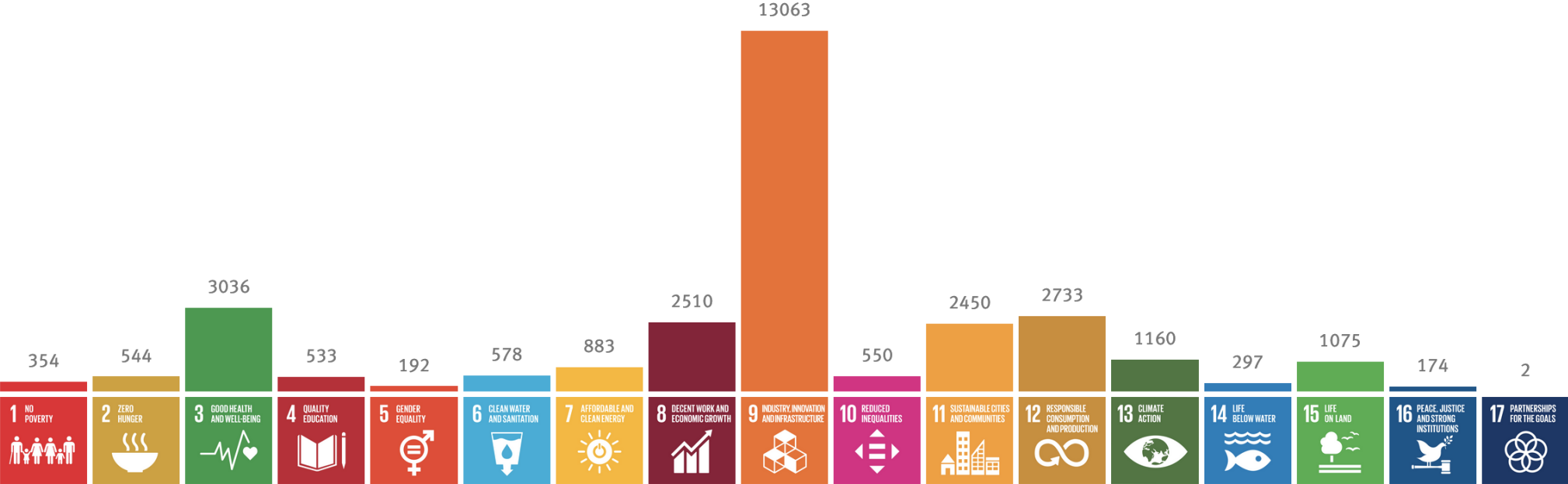
ISO 19011:2011 - sets out guidance on internal and external audits of quality management systems.

International standards represent a powerful instrument to influence the development of services, policies, products, and environments. They help society in a post-pandemic scenario to accelerate the achievement of the SDGs.

There are currently 17 SDGs and more than 20,000 international standards across the world addressing topics such as manufactured products, technology, food safety, agriculture, and healthcare.

IMPACT AT A GLANCE

ISO contributes to all of the SDGs. Here you can see the number of ISO standards that are directly applicable to each Goal.



Research questions

How can we improve knowledge of the use of ISO standards and promote their benefits by purposefully connecting them with SDGs?

What evidence-based method could help to verify the connection between ISO standards and SDGs to allow for an improved impact of the standards among stakeholders, by offering insights to achieve the SDGs targets?

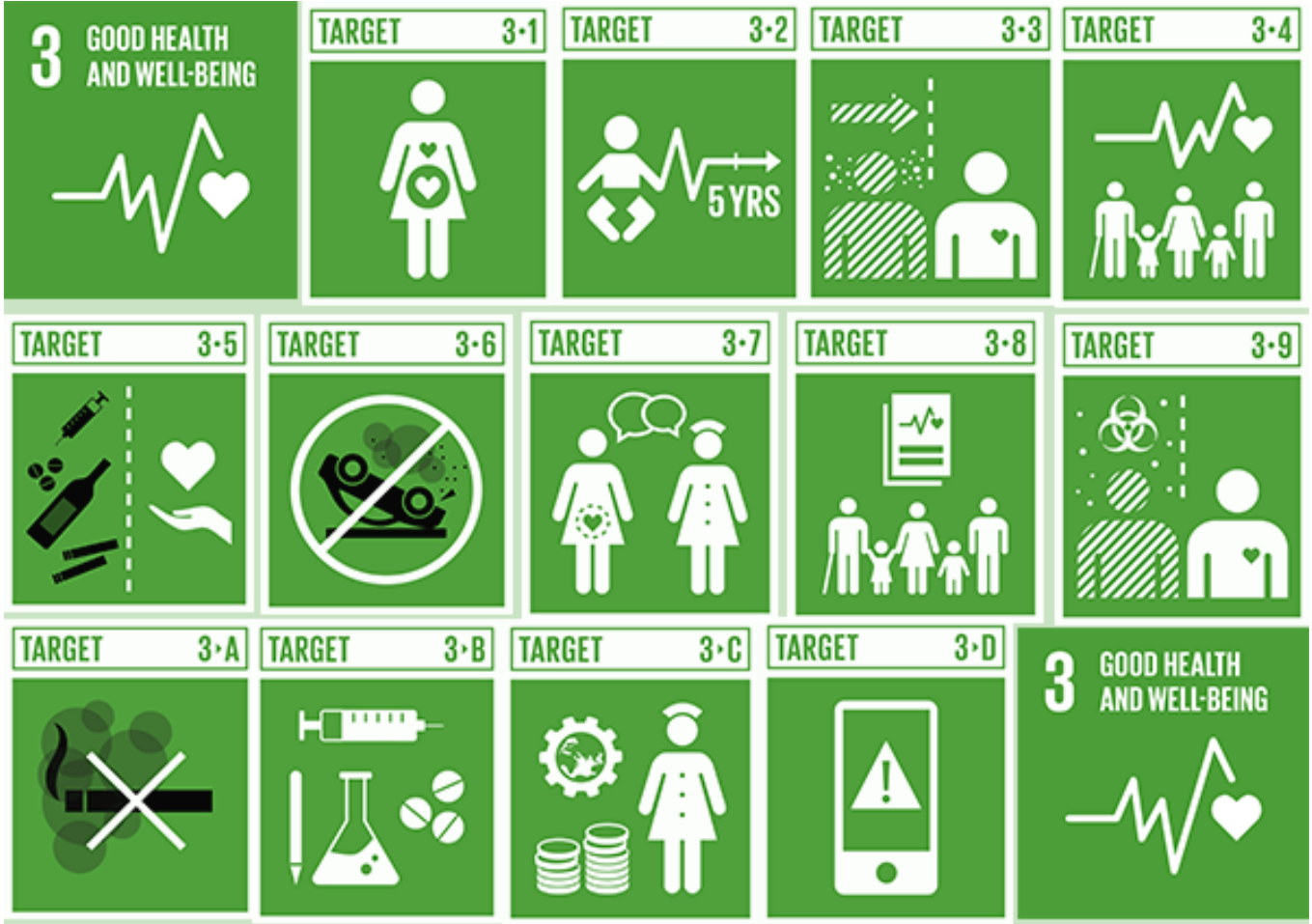


Project Overview

The Centre for eIntegrated Care (CeIC), through a dedicated research team (engaged with ISO committees at national and international level), is contracted by ISO (International Organization for Standardization) to conduct a mixed-method study with the overarching goals of developing a knowledge infographic framework, fostering a connection with international standards experts, and highlighting the impact and benefits that ISO standards have on SDG 3.

This process would allow us to build upon existing knowledge generated by ISO and other expert communities and verify, with evidence, the connections between international standards and SDGs focusing on practice-led strategies.

SDG N°3: Ensure healthy lives and promote well-being for all at all ages



Our Team



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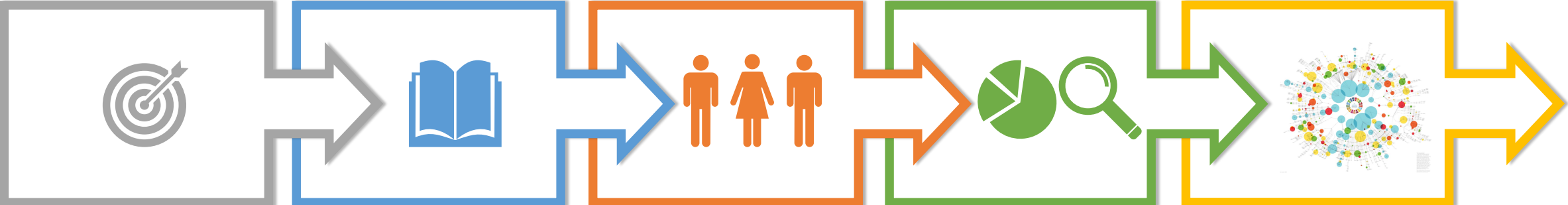


John David Damalerio



Sharon Farrell

Research methodology



SDG Domain Selection

Quantitative Study: State of the Art

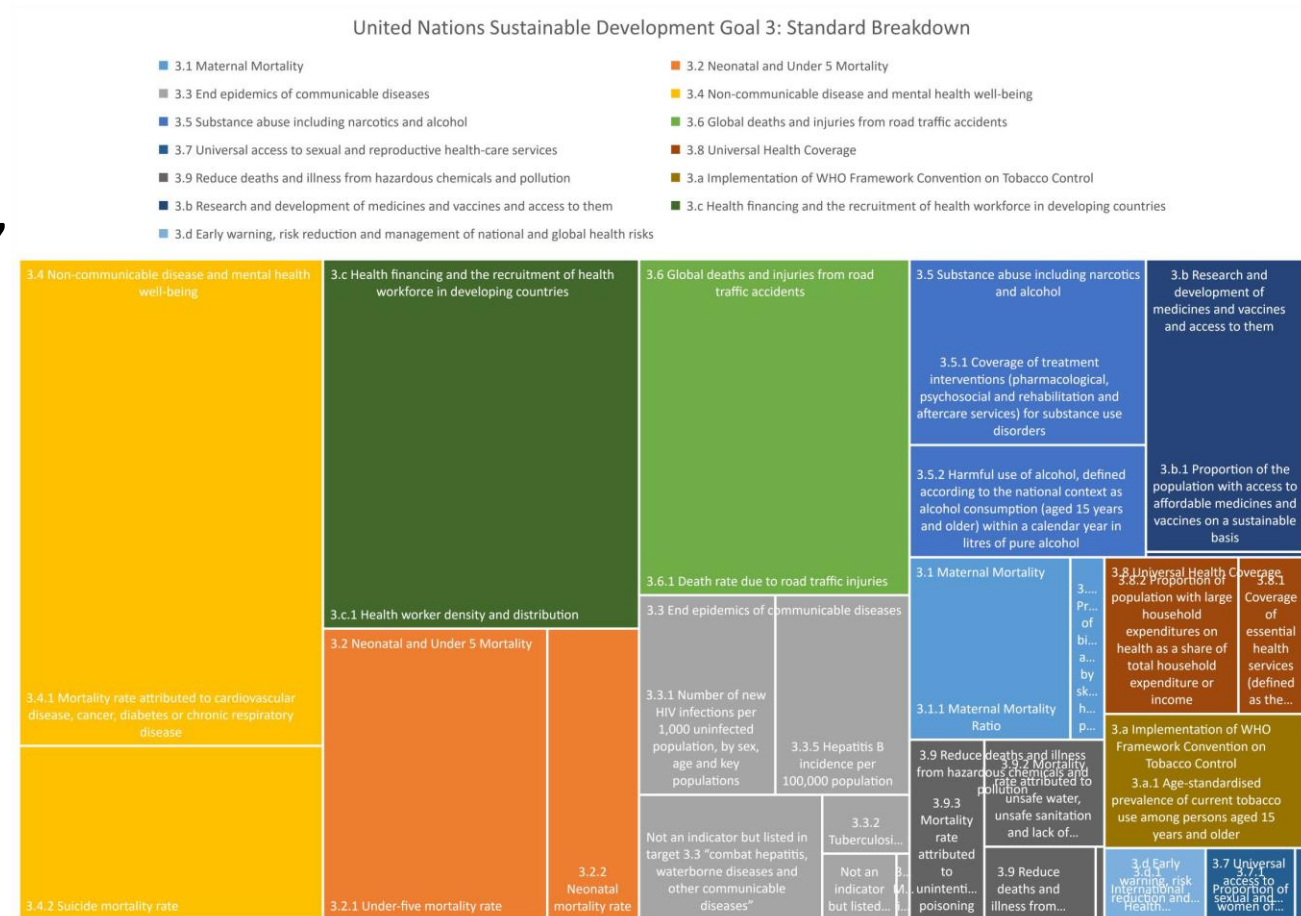
Partnering & Qualitative Study

Data Analysis & Validation

Infographic Framework Implementation

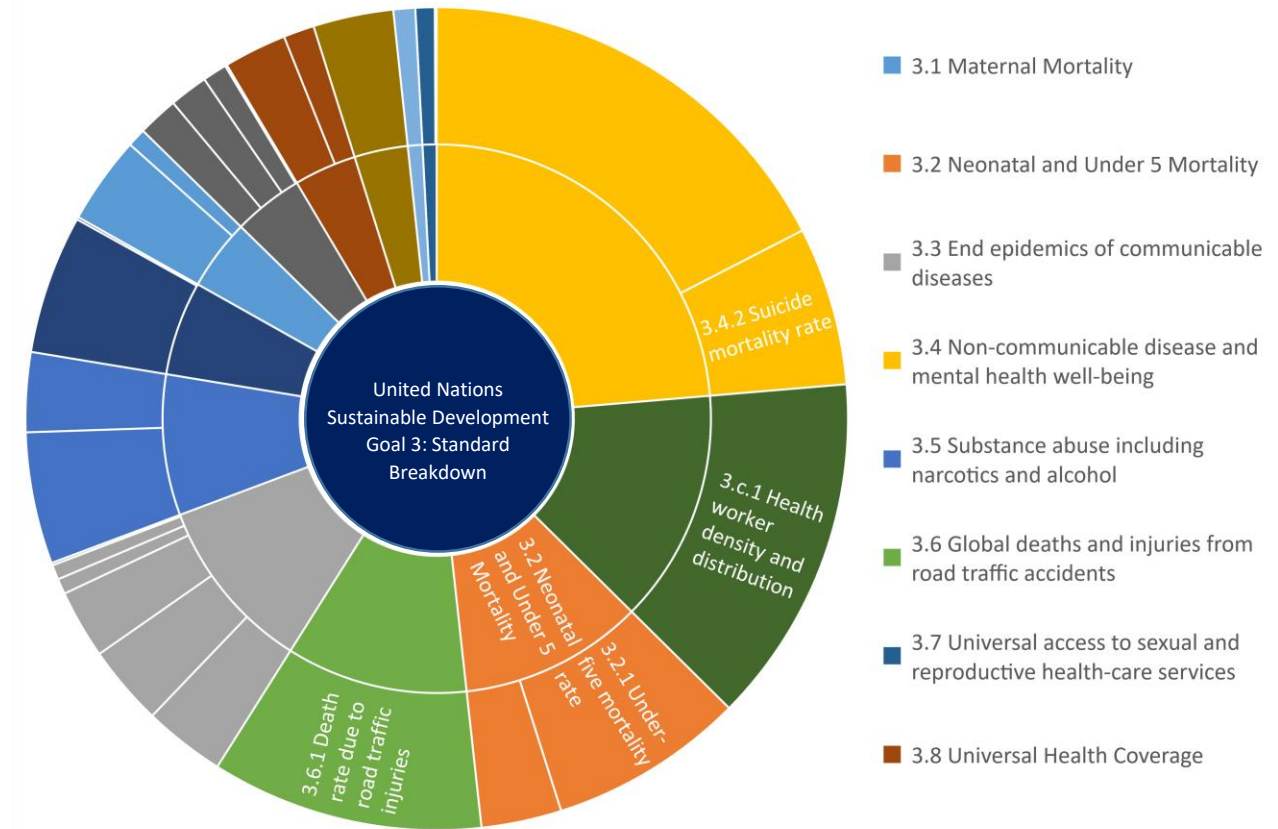
Research goal

To build upon existing knowledge generated by ISO and other expert communities, and verify, with evidence, the connections between international standards and SDGs focusing on practice-led strategies.



Quantitative Study

- Keywords related to SDG3 targets were identified
- Search conducted using ISO Online Browsing Platform
- In total, 28,624 standards were found to contain one of the keywords searched
- 3,964 standards relating to “Health, medicine, and laboratory equipment” were found



Determining Impact/Relevance through Text Analysis approaches

- Two independently developed approaches for determining relevance of a standard
- NVIVO was used for a pilot analysis of 100 standards
- R was used for a pilot analysis of 30 standards



NVIVO Document Analysis Software

- Document analysis software that facilitates text-mining functionality
- 100 standards were imported to NVIVO
- Exploration function was used to conduct text searches of keywords
- E.g: ‘pregnancy OR pregnant OR pregna*’ returned 28 standards that contained one of the keywords outlined in the search equalling to 158 total references
- Relevance was determined by reviewing the context that the keywords were used in the standard, and reviewing the foreword/scope/introduction of the standard



| Target Indicator | Standard Reference | ISO Project ID | Standard Title | Year | Primary Topic | Text Search Re Context Of Use | Reference Relevant? | Text Search Re Context Of Use | Reference Relevant? | Text Search Re Context Of Use | Reference Relevant? |
|--------------------------|----------------------|----------------|-------------------|------|---------------------------|-------------------------------|---------------------|-------------------------------|---------------------|-------------------------------|---------------------|
| 3.1.1 Maternal Mortality | ISO 28003:2012 | 44965 | Ergonomics of th | 2012 | Specifications/Guidelines | 0 N/A | N/A | 2 Example/Den | No | 1 Example/Den | No |
| | ISO/TR 19231:2014 | 64062 | Health informatic | 2014 | Health Informatics | 1 Health Proje | Indirect | 0 N/A | N/A | 0 N/A | N/A |
| | ISO/TS 27527:2010 | 44216 | Health informatic | 2010 | Health Informatics | 1 Example/Den | No | 0 N/A | N/A | 41 DOB | No |
| | ISO 22657:2013 | 52955 | Health informatic | 2013 | Health Informatics | 0 N/A | N/A | 4 Example/Den | No | 1 Example/Den | No |
| | ISO 17090-4:2020 | 74357 | Health informatic | 2020 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 1 Example/Den | No |
| | ISO/TR 14639-2:2014 | 54903 | Health informatic | 2014 | Health Informatics | 0 N/A | N/A | 2 Example/Den | No | 6 Example/Den | No |
| | ISO/DIS 12417-1 | 82032 | Cardiovascular in | 2015 | Medical Devices | 0 N/A | N/A | 0 N/A | N/A | 1 DOB | No |
| | ISO 13940:2015 | 58102 | Health informatic | 2015 | Health Informatics | 0 N/A | N/A | 2 Example/Den | Indirect | 1 Example/Den | Indirect |
| | ISO/TS 19844:2018 | 71965 | Health informatic | 2018 | Health Informatics | 18 Coding | No | 0 N/A | N/A | 0 N/A | N/A |
| | ISO/TS 22077-4:2019 | 68333 | Health informatic | 2019 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 4 DOB | No |
| | ISO 23190:2021 | 74848 | Traditional Chine | 2021 | Process Outline | 0 N/A | N/A | 0 N/A | N/A | 1 Irrelevant | No |
| | ISO 18612:2003 | 33668 | Health informatic | 2003 | Health Informatics | 0 N/A | N/A | 1 Example/Den | No | 4 DOB | No |
| | ISO 12687-3:2020 | 71098 | Health informatic | 2020 | Health Informatics | 0 N/A | N/A | 1 Example/Den | No | 4 DOB | No |
| | ISO 80601-2-12:2020 | 72069 | Medical electrica | 2020 | Medical Devices | 0 N/A | N/A | 3 Example/Den | Indirect | 1 Example/Den | Indirect |
| | ISO 21802:2019 | 71712 | Assistive product | 2019 | Assistive Product | 0 N/A | N/A | 0 N/A | N/A | 2 Example/Den | No |
| | ISO/IEEE 11073-1010 | 77338 | Health informatic | 2020 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 14 Coding | No |
| | ISO/DIS 4454 | 79891 | Genomics inform | N/A | Genomics Informatics | 7 Coding | No | 2 Coding | No | 7 DOB | No |
| | IEC 60601-2-52:2009 | 36067 | Medical electric | 2009 | Safety Requirements | 2 Example/Den | No | 0 N/A | N/A | 1 Example/Den | No |
| | ISO/IEC 10781:2015 | 57757 | Health informatic | 2015 | Health Informatics | 0 N/A | N/A | 8 Coding | No | 2 DOB | No |
| | ISO 21298:2017 | 63514 | Health informatic | 2017 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 3 Example/Den | No |
| | ISO/IEEE 11073-1010 | 63904 | Health informatic | 2014 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 1 DOB | No |
| | ISO 17523:2016 | 59952 | Health informatic | 2016 | Health Informatics | 0 N/A | N/A | 2 Inclusion/Exc | No | 7 DOB | No |
| | ISO 29539-2:2020 | 69835 | Cardiovascular in | 2020 | Medical Devices | 0 N/A | N/A | 0 N/A | N/A | 1 DOB | No |
| | ISO/TR 12300:2014 | 51344 | Health informatic | 2014 | Health Informatics | 0 N/A | N/A | 0 Example/Den | Indirect | 1 DOB | Indirect |
| | ISO 12417-1:2015 | 67957 | Cardiovascular in | 2015 | Medical Devices | 0 N/A | N/A | 0 N/A | N/A | 1 DOB | No |
| | ISO 11073-91064:2006 | 46493 | Health informatic | 2006 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 6 DOB | No |
| | ISO 22600-3:2014 | 62655 | Health informatic | 2014 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 1 Example/Den | No |
| | ISO 80601-2-85:2021 | 72442 | Medical electrica | 2021 | Medical Devices | 0 N/A | N/A | 1 Inclusion/Exc | No | 1 Irrelevant | No |
| | ISO 8124-2:2014 | 59695 | Safety of toys | 2014 | Safety Requirements | 0 N/A | N/A | 0 N/A | N/A | 1 Irrelevant | No |
| | ISO 12381:2019 | 74356 | Health informatic | 2019 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 1 DOB | No |
| | ISO 20301:2014 | 65051 | Health informatic | 2014 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 1 DOB | No |
| | ISO 16496:2013 | 56888 | Dentistry — Miri | 2013 | Specifications/Guidelines | 0 N/A | N/A | 0 N/A | N/A | 1 DOB | No |
| | ISO/TS 22287:2019 | 73036 | Health informatic | 2019 | Health Informatics | 0 N/A | N/A | 0 N/A | N/A | 1 Example/Den | No |

Scalable Text Analysis Overview Document

- Information gathered from text analysis was used to populate an Google spreadsheet (can be done through Excel as well) which provides an overview of a standard's information and relevance.
- Heading columns can be scaled up or down depending on the number of 'key words' searched using text analysis software
- Automatically changes colour based on information input to a cell (e.g. relevant = green, indirectly relevant = yellow, not relevant = red).

| Target Indicator | Standard Reference | ISO Project ID | Standard Title | Year | Primary Topic | Text Search Re | Context Of Use | Reference Relevant? | Text Search Re | Context Of Use | Reference Relevant? | Text Search Re | Context Of Use | Reference Relevant? |
|--------------------------|----------------------|----------------|-------------------|------|---------------------------|----------------|----------------|---------------------|----------------|----------------|---------------------|----------------|----------------|---------------------|
| 3.1.1 Maternal Mortality | ISO 28803:2012 | 44965 | Ergonomics of th | 2012 | Specifications/Guidelines | 0 | N/A | N/A | 2 | Example/Den | No | 1 | Example/Den | No |
| | ISO/TR 19231:2014 | 64062 | Health informatic | 2014 | Health Informatics | 1 | eHealth Proje | Indirect | 0 | N/A | N/A | 0 | N/A | N/A |
| | ISO/TS 27527:2010 | 44216 | Health informatic | 2010 | Health Informatics | 1 | Example/Den | No | 0 | N/A | N/A | 41 | DOB | No |
| | ISO 22857:2013 | 52955 | Health Informatic | 2013 | Health Informatics | 0 | N/A | N/A | 4 | Example/Den | No | 1 | Example/Den | No |
| | ISO 17050-4:2020 | 74357 | Health Informatic | 2020 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 1 | Example/Den | No |
| | ISO/TR 14639-2:2014 | 54903 | Health Informatic | 2014 | Health Informatics | 0 | N/A | N/A | 2 | Example/Den | No | 6 | Example/Den | No |
| | ISO/IS 12417-1 | 80332 | Cardiovascular in | 2015 | Medical Devices | 0 | N/A | N/A | 0 | N/A | N/A | 1 | DOB | No |
| | ISO 13940:2015 | 58102 | Health Informatic | 2015 | Health Informatics | 0 | N/A | N/A | 2 | Example/Den | Indirect | 1 | Example/Den | Indirect |
| | ISO/TS 19844:2018 | 71965 | Health Informatic | 2018 | Health Informatics | 18 | Coding | No | 0 | N/A | N/A | 0 | N/A | N/A |
| | ISO/TS 22077-4:2019 | 69333 | Health Informatic | 2019 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 4 | DOB | No |
| | ISO 23190:2021 | 74848 | Traditional Chine | 2021 | Process Outline | 0 | N/A | N/A | 0 | N/A | N/A | 1 | Irrelevant | No |
| | ISO 18612:2003 | 33668 | Health Informatic | 2003 | Health Informatics | 0 | N/A | N/A | 1 | Example/Den | No | 4 | DOB | No |
| | ISO 12987-3:2020 | 71039 | Health Informatic | 2020 | Health Informatics | 0 | N/A | N/A | 1 | Example/Den | No | 4 | DOB | No |
| | ISO 80061-2-12:2020 | 72069 | Medical electrica | 2020 | Medical Devices | 0 | N/A | N/A | 3 | Example/Den | Indirect | 1 | Example/Den | Indirect |
| | ISO 21802:2019 | 71712 | Assistive product | 2019 | Assistive Product | 0 | N/A | N/A | 0 | N/A | N/A | 2 | Example/Den | No |
| | ISO/IEEE 11073-1010 | 77338 | Health Informatic | 2020 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 14 | Coding | No |
| | ISO/IEEE 4454 | 79991 | Genomics inform | NA | Genomics Informatics | 7 | Coding | No | 2 | Coding | No | 7 | DOB | No |
| | IEC 60601-2-52:2009 | 36067 | Medical electrica | 2009 | Safety Requirements | 2 | Example/Den | No | 0 | N/A | N/A | 1 | Example/Den | No |
| | ISO/HL 10781:2015 | 57757 | Health Informatic | 2015 | Health Informatics | 0 | N/A | N/A | 8 | Coding | No | 2 | DOB | No |
| | ISO 21286:2017 | 63514 | Health Informatic | 2017 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 3 | Example/Den | No |
| | ISO/IEEE 11073-1010 | 63004 | Health Informatic | 2014 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 1 | DOB | No |
| | ISO 17523:2016 | 59952 | Health Informatic | 2016 | Health Informatics | 0 | N/A | N/A | 2 | Inclusion/Exc | No | 7 | DOB | No |
| | ISO 25539-2:2020 | 69835 | Cardiovascular in | 2020 | Medical Devices | 0 | N/A | N/A | 0 | N/A | N/A | 1 | DOB | No |
| | ISO/TR 12300:2014 | 51344 | Health Informatic | 2014 | Health Informatics | 0 | N/A | N/A | 3 | Example/Den | Indirect | 1 | DOB | Indirect |
| | ISO 12417-1:2015 | 57697 | Cardiovascular in | 2015 | Medical Devices | 0 | N/A | N/A | 0 | N/A | N/A | 1 | DOB | No |
| | ISO 11073-91064:2006 | 46493 | Health Informatic | 2006 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 6 | DOB | No |
| | ISO 22600-3:2014 | 62655 | Health Informatic | 2014 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 1 | Example/Den | No |
| | ISO 80061-2-65:2021 | 72442 | Medical electrica | 2021 | Medical Devices | 0 | N/A | N/A | 1 | Inclusion/Exc | No | 1 | Irrelevant | No |
| | ISO 8124-2:2014 | 59056 | Safety of toys -- | 2014 | Safety Requirements | 0 | N/A | N/A | 0 | N/A | N/A | 1 | Irrelevant | No |
| | ISO 12381:2019 | 74356 | Health Informatic | 2019 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 1 | DOB | No |
| | ISO 20301:2014 | 60501 | Health Informatic | 2014 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 1 | DOB | No |
| | ISO 16498:2013 | 56888 | Dentistry -- Mini | 2013 | Specifications/Guidelines | 0 | N/A | N/A | 0 | N/A | N/A | 1 | DOB | No |
| | ISO/TS 22287:2019 | 73036 | Health Informatic | 2019 | Health Informatics | 0 | N/A | N/A | 0 | N/A | N/A | 1 | Example/Den | No |

R Statistical Computing Software

- Powerful software that can be programmed to analyse documents input into it
- 30 standards were inputted into R
- ‘Keywords’ were searched with a correlation limit of 0.75 to identify other terms not initially identified
- Outputs a breakdown that shows the keywords, and correlated terms and their occurrence in the inputted documents.
- Relevance can be determined through keyword occurrence in the document

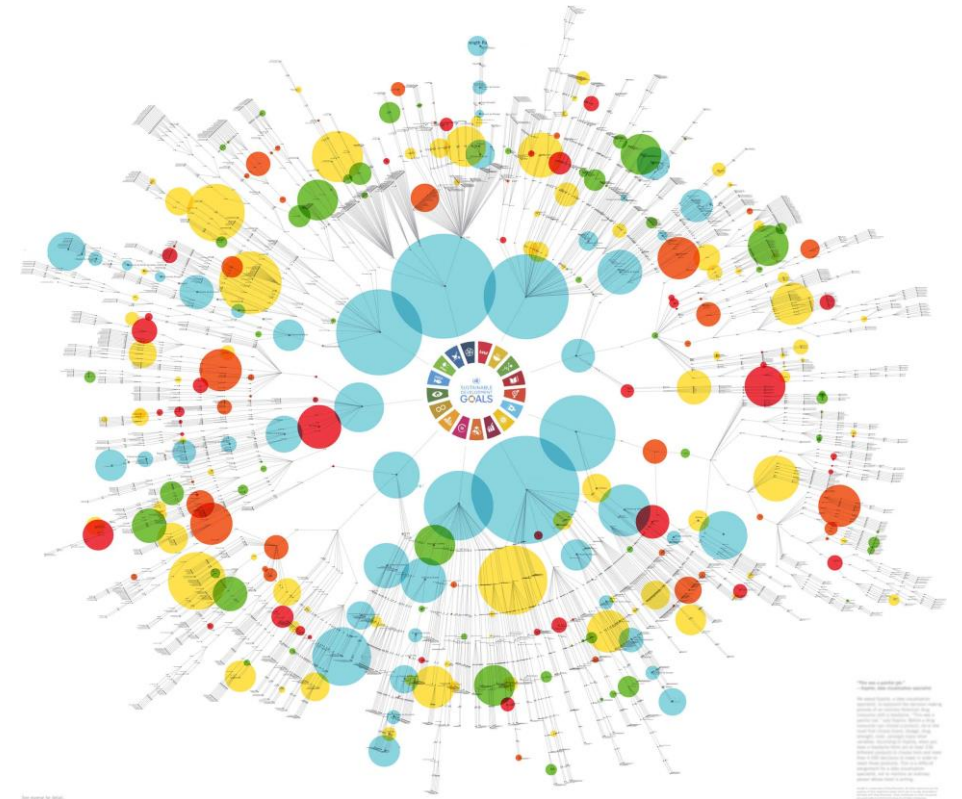


```
> inspect(Copinions.tdm[c("pregnancy", "fertility", "women", "ectopic", "pregnant"),])
<<TermDocumentMatrix (terms: 5, documents: 30)>>
Non-/sparse entries: 19/131
Sparsity           : 87%
Maximal term length: 9
Weighting          : term frequency (tf)
Sample            :
  Docs
Terms iso_10993.pdf iso_11073.pdf iso_11249.pdf iso_12417-ed2.pdf iso_12417.pdf iso_12967-3.pdf iso_13022.pdf
ectopic      0          2          5          0          0          0          1
fertility    0          0          2          1          1          0          0
pregnancy    0          0         59          0          0          1          1
pregnant     0          0          3          0          0          0          0
women        2          0         24          0          0          0          0

  Docs
Terms iso_13606-1.pdf iso_13940.pdf iso_4454.pdf
ectopic      0          0          0
fertility    0          0          0
pregnancy    3          1          2
pregnant     0          1          0
women        0          0          1
```

Outcome

Evidence-based validation of the theoretical foundations identified by the ISO committee and other relevant sources and a thorough ISO-SDG graph database including a mapping to relevant standards to allow for knowledge democratization of the links between standards and SDGs, how they are used and in what context adopted.



Thank you for your attention



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