

Scientometric Assessment of Trends in Evolving World of Digital Health Research Publications - Sensors, Actigraphy, Wearable Devices and More

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BACKGROUND

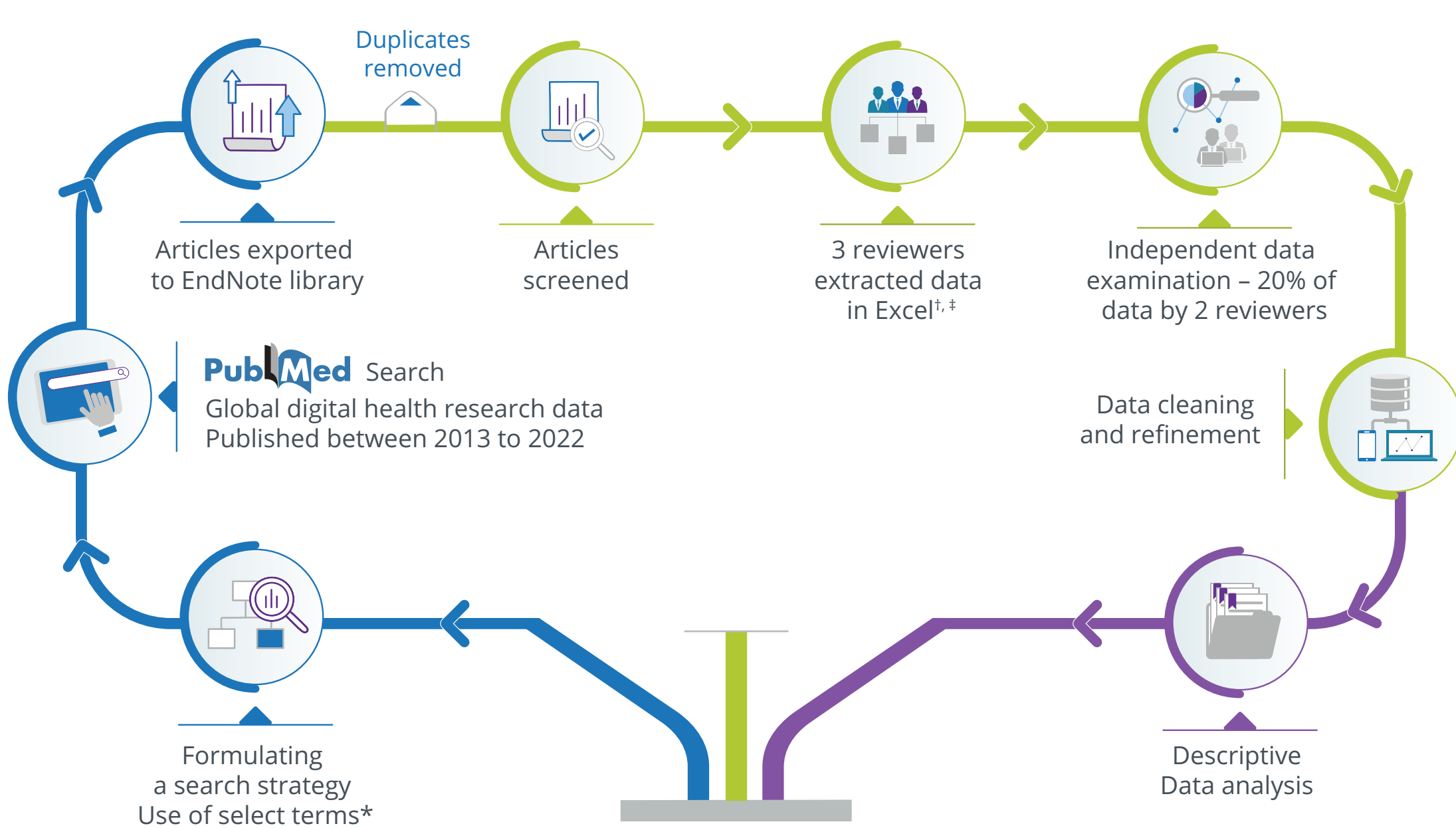
- Digital health technology is recognized as an emerging field in medical informatics, enhancing the reach and access to health care globally.^{1,2} It can potentially expand the clinical repertoire of personalized patient-specific measures crucial for the future of precision health.¹⁻³
- In recent years, clinical trials have evolved with advancement in wireless connectivity, sensors, proliferation of mobile devices, and wearables. These technologies enable organizations and physicians to transition to a virtual healthcare model to remotely monitor the health of their patients.⁴
- Advantages to sponsors, physicians, and patients alike are also driving the increased interest in the arena of digital health research.^{4,5}

OBJECTIVE

- To assess the global medical publications on digital health research, focusing on trends/distribution across therapeutic areas and the devices utilized.

METHODS

Information processing: Data search, extraction, and analysis



*"digital health", "m-health", "e-health", "electronic health", "actigraphy", "wearable", "smartphones", "social media", "remote monitoring", "telemedicine", and "sensors". In addition, date range tag was limited to the period "2013-2022".
*Discrepancies were identified and resolved through discussion with a 4th and 5th reviewer.
*The extracted data items included title, PMID, year of publication, study design, therapeutic area, and types of instruments used.

Inclusion Criteria

- Clinical trials including randomized-controlled trials
- Articles published in English language only

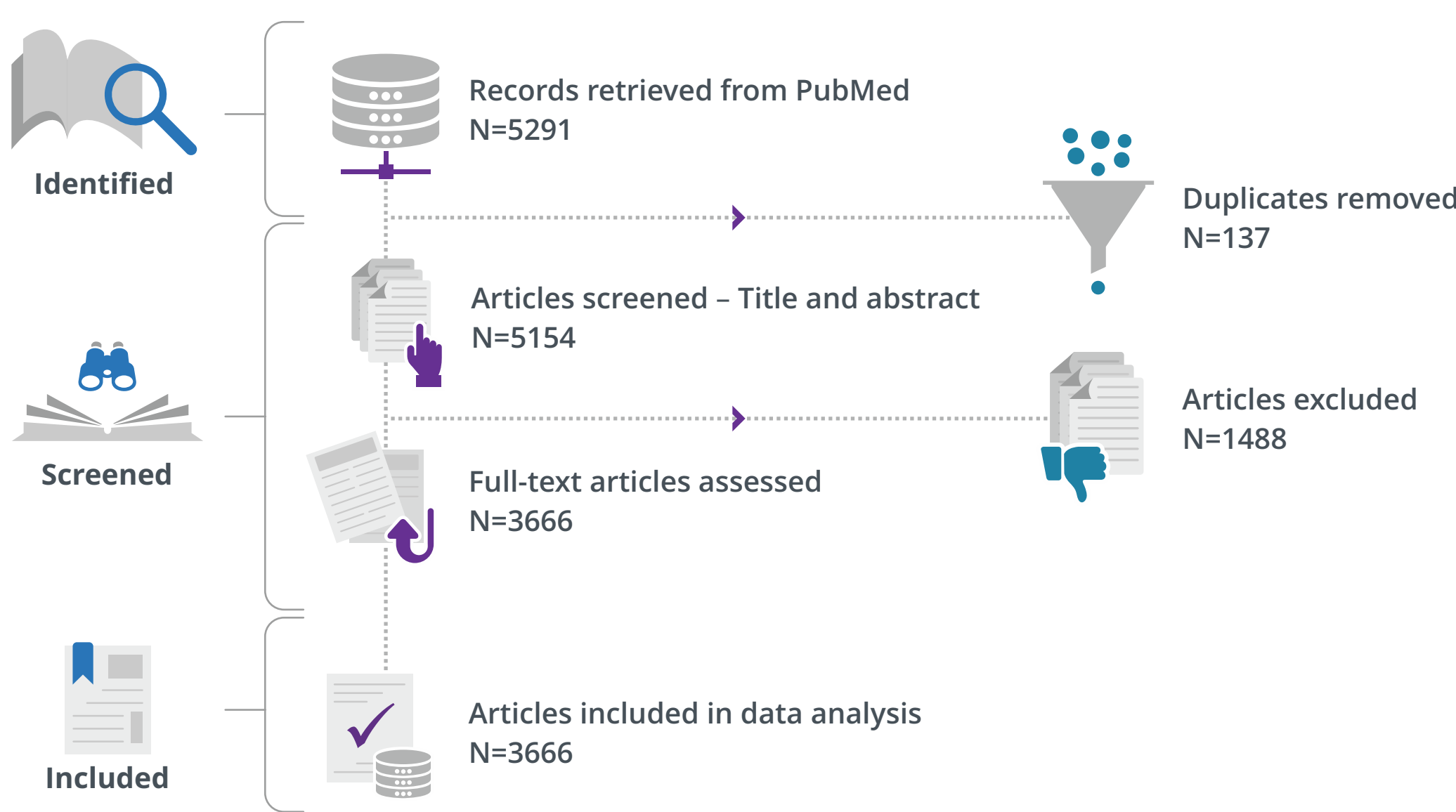
Exclusion Criteria

- Published protocols, guidelines, opinions, commentaries, and review articles
- Articles with only keyword mentions
- Articles focusing entirely on communication
- Articles with missing data (title, abstracts, key words, etc.)

RESULTS

Global digital health research articles retrieved from PubMed cumulated to a total of 5291 publications in 10 years from 2013-2022. The data analysis included 3666 (69.3%) articles in total.

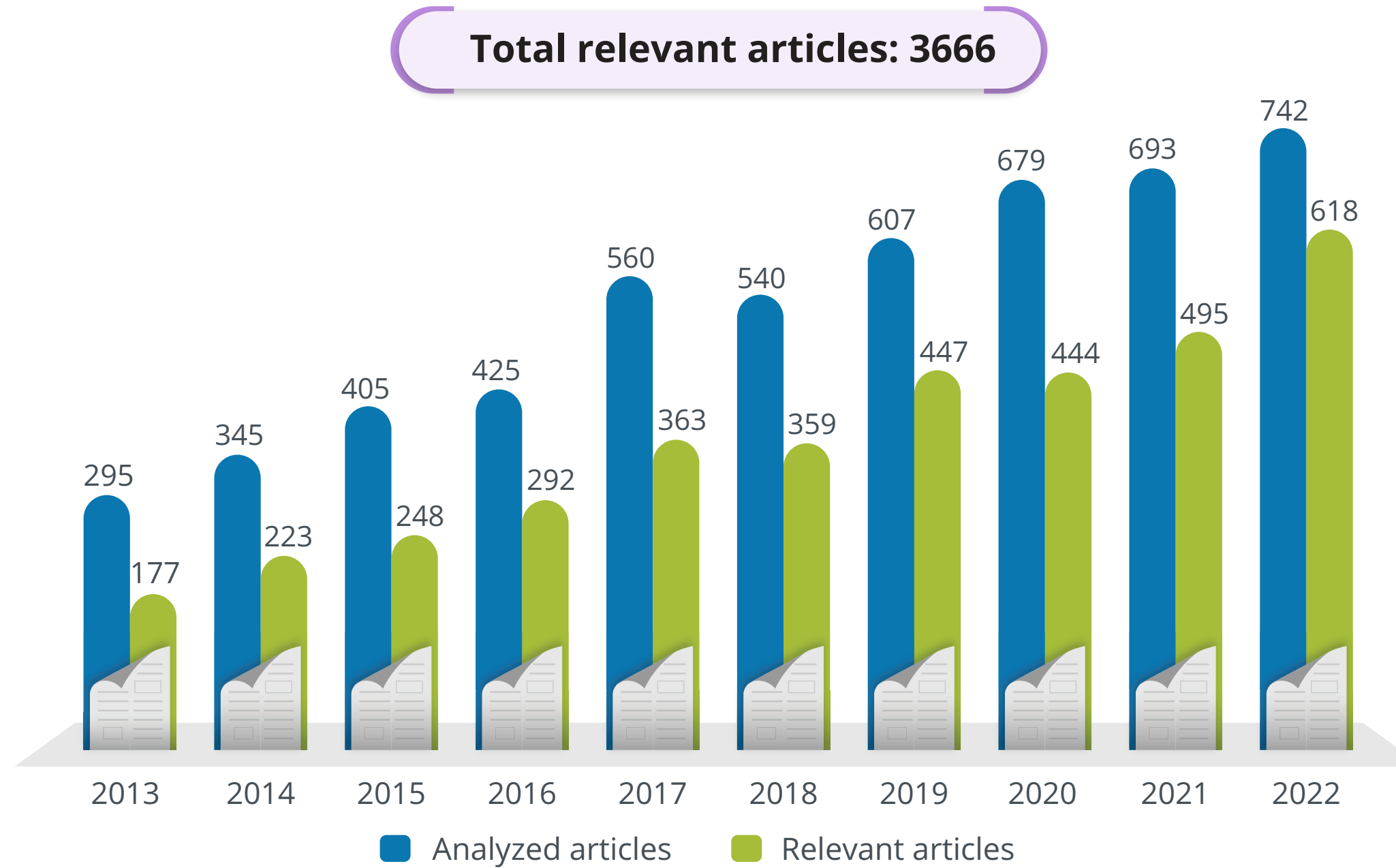
Articles on digital health research: Selection and data collection flow



The number of articles collected showed an increase by 11.2% per year, from 295 in 2013 to 742 in 2022. Absolute growth over the last 5 years was 60.6%, rising from 2030 digital health research publications in 2013-2017 to 3261 in 2018-2022.

The number of relevant articles, showed a similar trend; a rise from 177 in 2013 to 618 in 2022.

Relevant articles on digital health research published year-wise



Neuroscience had the highest publication share in digital health research (21.4%), followed by cardiology (15.7%) and metabolic disorders (13.2%).

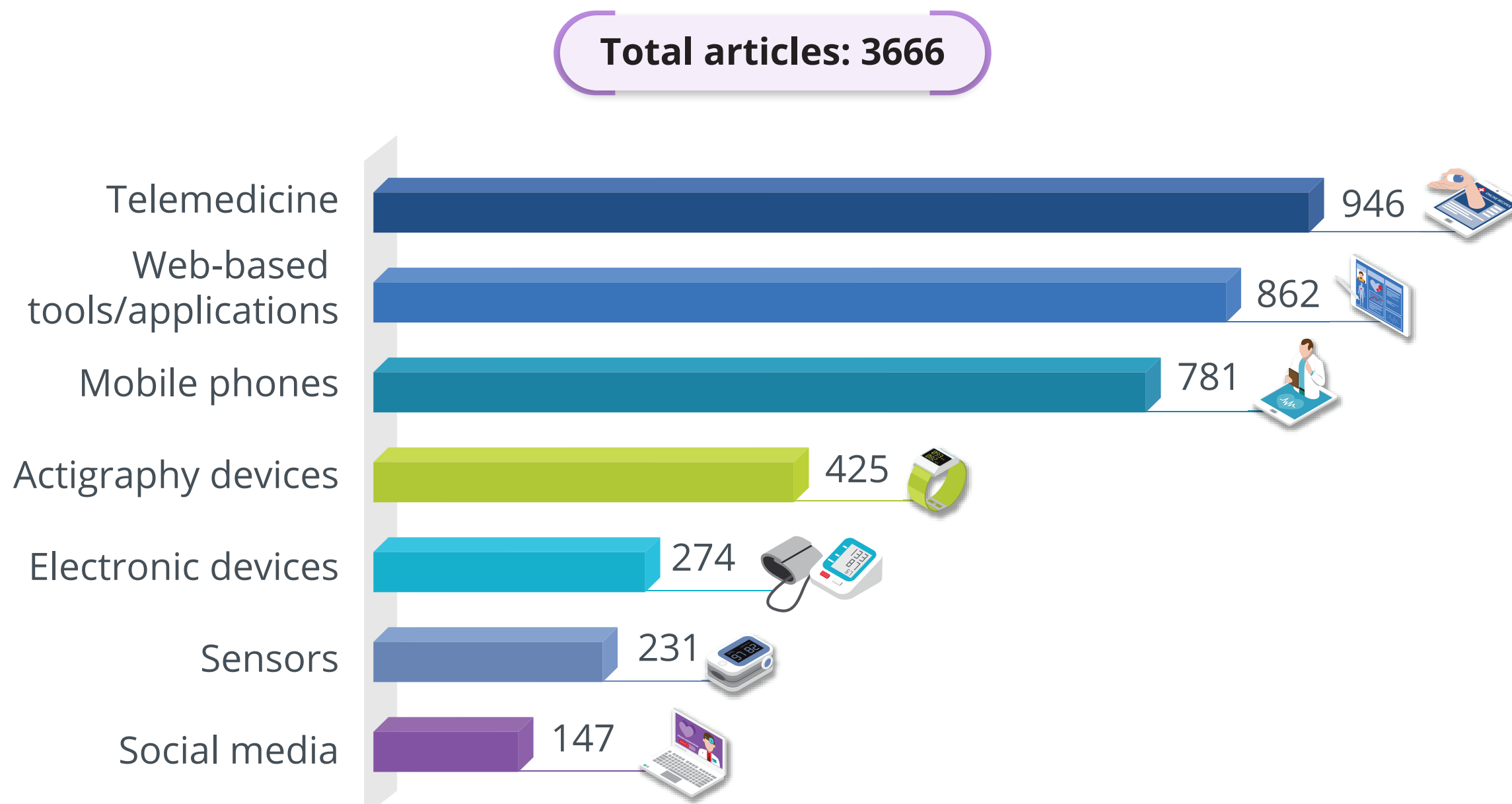
Distribution of articles based on therapeutic area/lifestyle diseases



*Included pediatrics, pulmonology, dermatology, ophthalmology, rheumatology, dentistry, nephrology, otolaryngology (ENT), etc.

Telemedicine (25.8%) was the most commonly used tool/instrument or digital method, followed by web-based tools or applications (including machine learning tools; 23.5%), mobile phones (applications or messages; 21.3%), and actigraphy devices (11.6%).

Distribution of digital methods or tools used in digital health research



CONCLUSIONS

- This study of global publications over a decade-long period reveals a trend of sizeable growth in the advances in digital technologies across a wide range of therapeutic areas.
- Over the last decade, neuroscience had the highest proportion of publications in digital health research.
- Telemedicine was found to be the most frequently used tool in digital health research.
- Our findings also confirm that the use of digital technologies in clinical trials has evolved to the extent of being established as a scientific domain.

FUTURE SCOPE

- This study considered only 1 database. In the future, more such databases or digital libraries (like Springer, Scopus, etc.) should be considered for varied publications, including nonindexed articles.
- Additional tools/applications and therapeutic areas can be explored to broaden the knowledge of publications in the rapidly expanding digital healthcare sector.

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DISCLOSURES

All authors are employees of SIRO Clinpharm Pvt. Ltd.

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