AI (Artificial Intelligence) in ENT

- **Transforming diagnostics, treatment planning, surgery, and patient monitoring.**

Diagnostics and Imaging

- **AI-assisted endoscopy and imaging:** Deep learning models help analyze images from nasal endoscopy, laryngoscopy, CT, and MRI scans to detect abnormalities like tumors, polyps, or sinus disease.

- **Voice and speech analysis:** Machine learning can detect voice disorders and laryngeal pathologies through acoustic analysis of speech.

Otology (Ear-related AI Applications)

- **Hearing loss diagnosis:** AI models analyze audiograms and patient history to classify types and causes of hearing loss.
- **AI in cochlear implants:** Algorithms help optimize cochlear implant programming for better outcomes.
- **Middle ear disease detection:** AI can assist in detecting otitis media using digital otoscopy images.

Head and Neck Oncology

- **Cancer detection:** AI is used to detect and classify head and neck cancers in radiological images and histopathological slides.

- **Predictive analytics:** Models can predict patient outcomes, recurrence risk, and treatment response.

Robotic and Image-Guided Surgery

- **AI-guided surgical navigation:** Enhances precision in ENT surgeries, especially in skull base and sinus procedures.

- **Robotic-assisted surgery:** Machine learning helps improve the safety and efficiency of robotic systems used in head and neck surgery.

Personalized Treatment and Prognosis

- **Treatment planning:** AI uses patient data to recommend personalized treatment pathways, particularly in oncology.

- **Outcome prediction:** Predicts complications, hospital stay duration, and recovery chances using patient-specific variables.

Virtual Assistants and Workflow Optimization

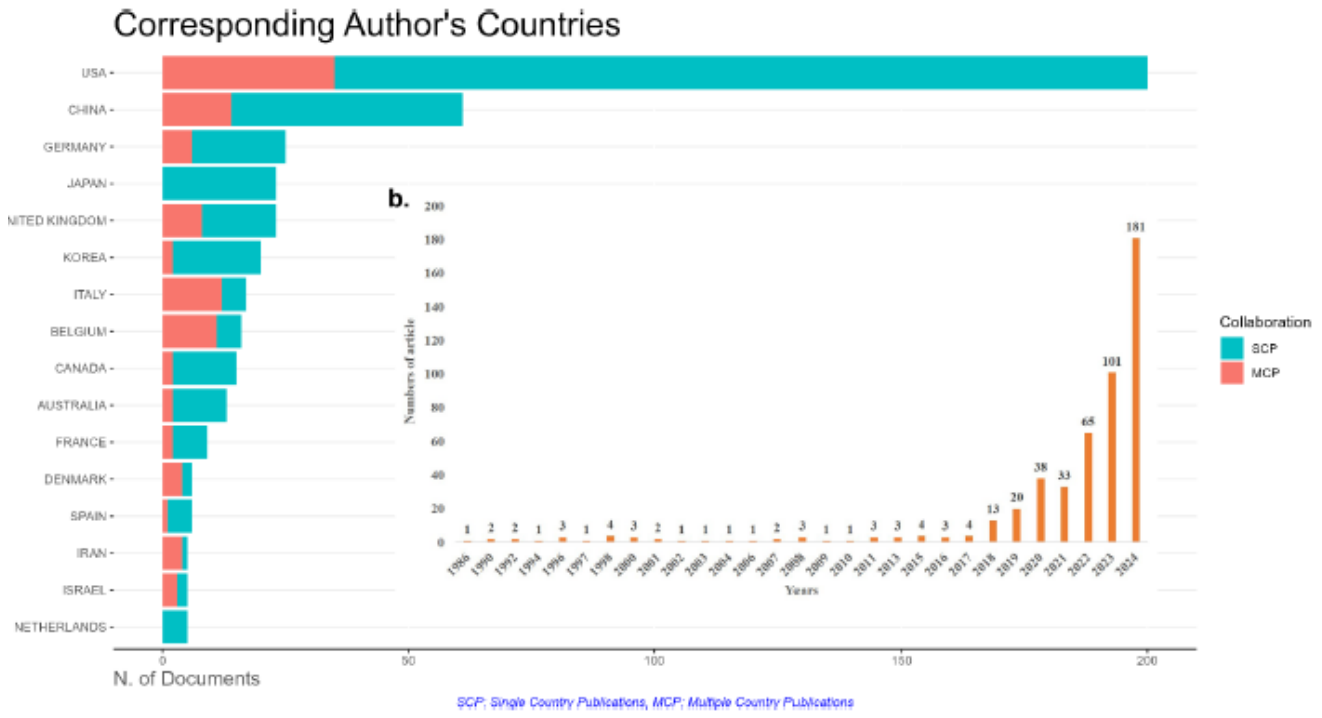
- **Clinical decision support systems (CDSS):** Aid ENT specialists in decision-making by integrating patient data and clinical guidelines.

- **Automated documentation and scheduling:** Natural Language Processing (NLP) can assist in transcribing notes and managing workflow.

- **The USA** (*n* = 200) and China (*n* = 61) were the most productive countries in AI-related ORL research.

- The most productive institutions were **Harvard University** / Harvard Medical School (*n* = 71).

Prolific countries with 5 or more publications



the top 50 keywords most frequently used by authors in the publications in AI