due to TBI. The registry dataset comprises concise information on patient demographics, injury characteristics, imaging, treatments, and short-term outcomes.

Conclusion: We present the registry development, data structure and functional protocol. The GEO-TBI collaboration will provide worldwide epidemiological data on TBI, and result in a network capable of examining neurotrauma hypotheses in a unique setting. Supported by the World Federation of Neurosurgical Societies, the GEO-TBI registry is open for participant site recruitment at https://www.geotbi.org.

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GLOBAL NEUROSURGERY AMONG THE EANS COMMUNITY: WHERE ARE WE AT?

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Background: A series of initiatives within the Global Neurosurgery (GN) community are focused on decreasing inequities in neurosurgical care between high (HICs) and low-middle income countries (LMICs). At present, the interest of the European Neurosurgeons in this topic remains largely unexplored.

Methods: An electronic survey addressed to EANS Neurosurgeons and trainees was developed and distributed. Data were collected prospectively, and results were analysed.

Results: Three hundred thirty-one responses were obtained from 33 EANS countries (84.6%). Most were from Germany (70; 21.1%), aged 30-34 (99; 46.3%) and came from trainees (169; 51%). A minority of respondents were aware of GN opportunities (125; 38.1%) and 36 (10.9%) had participated in GN rotations during residency. Faculty presence involved in GN projects was declared by 77 respondents (23.3%) and residency program/job environment was encouraging in a quarter of cases (86; 26%). A majority of 280 respondents (84.6%) stated their interest in participating in such initiatives and most (210; 63.4%) would be planning to participate in GN rotations, willing to self-fund their travel (264; 79.8%) and utilise their vacation time (282; 85,2%). A majority affirmed that GN is a priority they would focus on in their career (212; 64%) recognizing it as a possible career track (274; 82.8%). Clinical activity with surgical exposure would be the preferred type of involvement (287; 88.3%), the ideal duration of engagement would be 1-6 months for most (162; 48.9%). The survey identified barriers to involvement: time availability,(77%), lack of program support (67%), lack of available opportunities (65%) and financial concerns (65%). The most important motivating factor was cultural experience (85%).

Conclusions: Although a high proportion of European trainees/neurosurgeons seem interested in GN initiatives, several factors limit their participation, possibly hindering GN advances. However, most recognize the importance of this topic and would be available for GN initiatives.

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EXPLORING THE ADHERENCE TO GUIDELINES FOR ADULT SPINAL TRAUMA IN LOW AND MIDDLE-INCOMEHEALTHCARE ECONOMIES: A SURVEY ON BARRIERS AND POSSIBLE SOLUTIONS

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Background: The rate of new spinal trauma cases occurring in low and middle-income countries (LMICs) is around 9 times bigger than in high-income countries (HICs). However, disparities exist among different realities. These inequities may limit the application of guidelines and recommendations that require specific resources.

Methods: An electronic online survey addressed to physicians working in LMICs and treating patients with spinal injuries was developed using Google Modules (Google©) and Wenjuan©. Between May and August 2021 the survey was distributed in different ways (social network, emails, webinars). Data were collected prospectively and results tabulated in Microsoft Excel spread-sheet.

Results: One thousand one hundred fifty-four (1154) responses were obtained from 80 different LMICs. Most came from lower-middle-income countries (LMICs) (48.4%) and the Latin and Caribbean region (26%). Ninety per cent were males, 71.8% were aged 30-49 and 48.9% were specialists in Neurosurgery. Only 51% and 42.3% reported regularly receiving patients at high risk of spinal cord injury with a cervical collar or spinal backboard and the scene-to-door timing later than 24 hours nearly reached 50% in some contexts. Surgical decompression of spinal cord injury was later than 24 hours for 41.3%, reaching 70% in Sub-Saharan Africa. Transfer times were the most common cause of delays (61.4%). Only 49.5% reported treating spinal cord injury cases in the Intensive Care Unit, 21.6% in low-income economies. In some contexts, nearly 20% reported to don't being aware of any recommendation, However, 77.7% reported having the perception to have the possibility to apply the guidelines.

Conclusions: Big disparities were seen among different economic and geographical regions in the possibility to adhere to the recommendations for spinal trauma. Even if the adherence seems insufficient for most of the topics, a moderately high proportion of the respondents feels to be able to apply the guidelines.

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MANAGEMENT AND OUTCOMES OF SELLAR, SUPRASELLAR, AND PARASELLAR MASSES IN LOW-AND MIDDLE- INCOME COUNTRIES: A SCOPING REVIEW

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Background: There are several studies which describe the current management strategies and outcomes of SMs in High-Income Countries (HICs). However, there is little known the situation regarding SMs in Low and Middle-Income Countries (LMICs) apart from studies describing the experience from tertiary centres. With this study, we identified the epidemiology, diagnosis, management, and outcomes of SMs, SSMs, and PSMs in LMICs while reviewing and synthesising the relevant literature.

Methods: A systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-analysis extension for Scoping Review (PRISMA-ScR) guidelines were used to report the findings. MEDLINE, Embase, Global Index Medicus, and African Journals OnLine were the databases of choice. Cases were included if the pathology was related to the sellar, parasellar or suprasellar regions. The dataset was analysed using descriptive statistics via SPSS.

Results: We have included n=16589 patients from 49 LMICs. LMICs with the most studies were in China (n=49, 4.9%). Headache was the most reported symptom n=3995 with a mean of 29.82 cases per study (Range 0–130). Most reported tumour location was the sellar region n=12933 (85%). Somatotroph adenomas was the most diagnosed pituitary adenoma (n=3297). The most frequently diagnosed non-pituitary adenomatous mass was arachnoid cysts (n=282). Endoscopic approaches were far more utilised compared to microsurgical approaches, n=3418 and n=1730, respectively. Hormonal therapies with Cabergoline were administered in 1700 patients with prolactinoma.

Radiosurgery was performed in n=357 patients. The average follow-up duration was 33.26 months.

Conclusion: Neuro-oncology and pituitary research in LMICs remains under-reported. Our understanding of the current landscape of the management and outcomes of sellar, suprasellar and parasellar masses show that there is similarity to the management approaches utilised compared to HICs. The surgical outcomes, although largely underreported, were worse in LMICs compared to HICs, highlighting the need for more research and education.

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HOW TO START AND MAINTAIN A GLOBAL NEUROSURGICAL RESEARCH NETWORK; THE STORY OF THE GLOBAL NEUROSURG RESEARCH COLLABORATIVE

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Background: The Global Neurosurg research collaborative (GNC) was established in May 2018 at the Neurosurgery Department of Oregon Health and Science University with the aim of investigating the unmet global neurosurgical needs.

Methods: The model is based on a three-tier collaboration approach: the steering committee, national and regional leads, and the data collection teams. We started by identifying supportive senior neurosurgeons to formulate the steering committee. The steering committee met to prioritize the most important areas of surgical care in LMICs to be evaluated. Based on the literature search and expert consensus, we choose the following conditions: (1) Traumatic Brain Injury, (2) Stroke, (3) Hydrocephalus, (4) Brain Cancer Surgery, and (5) Epilepsy surgery. These conditions represent the most needed forms of neurosurgical care in LMICs. Then, a proposal was submitted to the host institution to sponsor the use of the RedCap system for the purpose of the GNC network. The protocol of the first study was distributed. We used professional networks, neurosurgical organizations, social media like Twitter and Facebook, and personal communications to recruit neurosurgeons. In LMICs, students and trainees played an important role in spreading the network. Local teams applied for institutional review board/ethical approval for the first TBI study.

Results: Till the moment, the GNC network includes 2000 collaborators from 80 countries around the world. The GNS-1 study is about to conclude with +2000 TBI patients' data collected from all over the world.

Conclusion: The GNC network presents a new model for global neurosurgical research in addressing the unmet neurosurgical needs in LMICs. Current and future studies of the GNC network will contribute to improving neurosurgical care by identifying the best practices associated with better outcomes as well as the risk factors of mortality, morbidity, and bad outcomes – this information will guide future development in LMICs.

13 TRENDS and INNOVATION
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ANARCHY IN ECONOMIC EVALUATIONS IN SPINE SURGERY: A SYSTEMATIC QUALITATIVE ASSESSMENT

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Background: Considering the rising healthcare expenses, economic evaluations are more pertinent than ever. There is no overview of recent literature and quality of cost-effectiveness in spine surgery. This systematic review aims to review current cost-effectiveness research methodology and quality, to serve as a basis to create evidence-based recommendations for economic evaluations in spine surgery.

Methods: The systematic search was conducted amongst 6 databases. Cost-effectiveness analyses of spine surgery published after 2011 were included.

Quality was assessed according to CHEC criteria. The following data items were evaluated: pathology, number of included participants, intervention(s) studied, year, country, study design, time horizon, comparator(s), utility measurement, effectivity measurement, costs measured, perspective, main result, incremental cost-effectiveness ratio (ICER), and study quality.

Results: A total of 108 studies were included. Of these, 56 studies were retrospective and trial-based. The majority concerned the lumbosacral spine (n=61). Other studies concerned the cervical spine (n=18), spinal deformity surgery (n=16), trauma (n=10) and oncology (n=3). The majority had shorter follow-up than 2 years. Utility measures varied between the EuroQol 5 dimensions (EQ-5D) and variations of the Short-Form Health Survey (e.g., SF-36). Effect measures varied widely. All studies included direct costs from a healthcare perspective. Costs of hospitalisation, procedure and pharmaceuticals were mainly assessed. Indirect costs were included in 43 studies, and mostly concerned loss of productivity. The mean CHEC score was 12.4/19.

Conclusion: Cost-effectiveness in spine surgery appears to be a hot topic in the last decade. Unfortunately, the comparability of these studies is extremely low. This is the repercussion of lacking governance in methodology. Disease-specific recommendations, as complement to existing general guidelines, will ameliorate comparability and interpretability and thus, overall research quality. The next step of this project is to develop expert-based recommendations for the design, conduct, and reporting of economic evaluations in spine surgery in a Delphi study.

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THE ARTIFICIAL INTELLIGENCE MOTION STUDY (AIM): ARTIFICIAL INTELLIGENCE-ASSISTED IMAGE RECOGNITION OF CERVICAL SPINE MOTION

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Background: Analysing motion in the spine remains a challenge. Spinal motion is commonly analysed through segmental range of motion. However, this method shows high intra- and interindividual variability.

In a previous study by our group, motion patterns in radiographic recordings of flexion and extension were investigated. Contours of the occiput (C0) and cervical vertebrae (C1-C7) were manually drawn and corrected, which is very labor-intensive.

The present study uses the annotated data to train two deep learning segmentation models to recognise and track cervical vertebrae.

Methods: Radiographic flexion-extension recordings of healthy volunteers and pre-operative patients with degenerative disc disease were used. C0-C7 were manually annotated in all successive frames of the recordings.

To achieve the localisation of vertebrae across multiple frames, two segmentation approaches were developed using ResUnet++ network and Mask-RCNN. The ResUnet++ network was trained for segmentation of C4-C7 on 5720 images and validated in 520 images. The Mask-RCNN model was trained on 2025 images and validated in 176 images for C0-C7.

Results: The AI-models almost exactly identify cervical vertebral contours (Fig. 1).
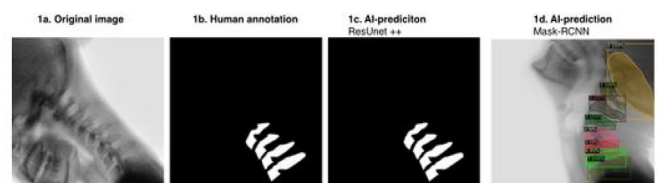
Conclusion: This method enables time-efficient and accurate segmentation of C0-C7. Moreover, human experience and training is not required. The accessibility of this method allows more extensive analysis of spinal motion, of which in-depth knowledge is currently still lacking. The next steps will be to further