A systematic review of COVID-19 literature - Neurological effects and SARS-CoV-2

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What is CIAO?

- CIAO is a project for Modelling the Pathogenesis of **C**OVID-19 *using* the **A**dverse **O**utcome Pathway (AOP) framework[1].

- Brings together >75 scientists from across the globe contributing different expertise into several working groups.

- Depends on efficient identification & AOP structured analysis of relevant data to generate knowledge about critical aspects of COVID-19.

- The **literature review working group** applies a systematic review-driven approach to facilitate data identification and analysis within CIAO and more generally into the AOP framework.
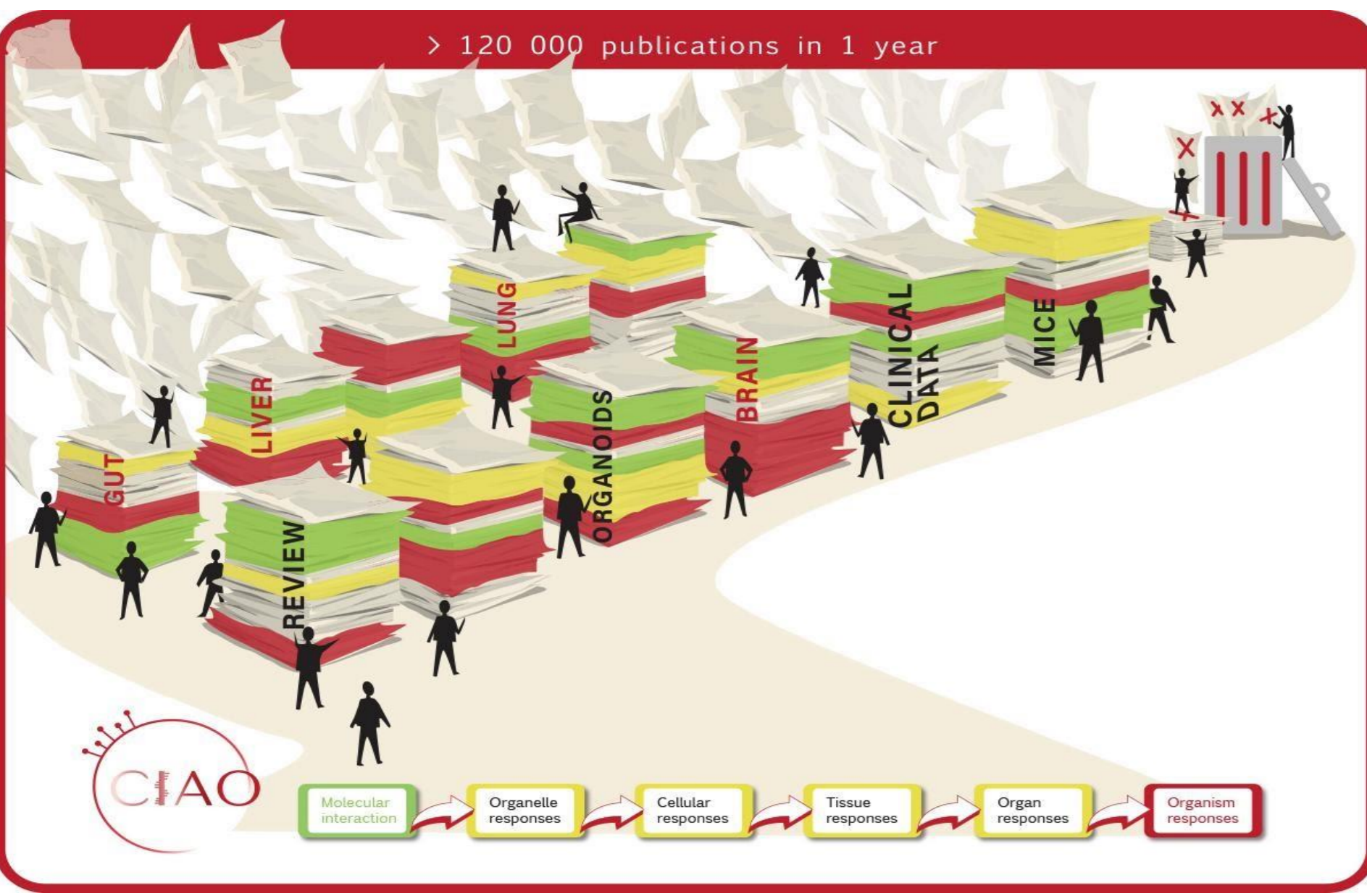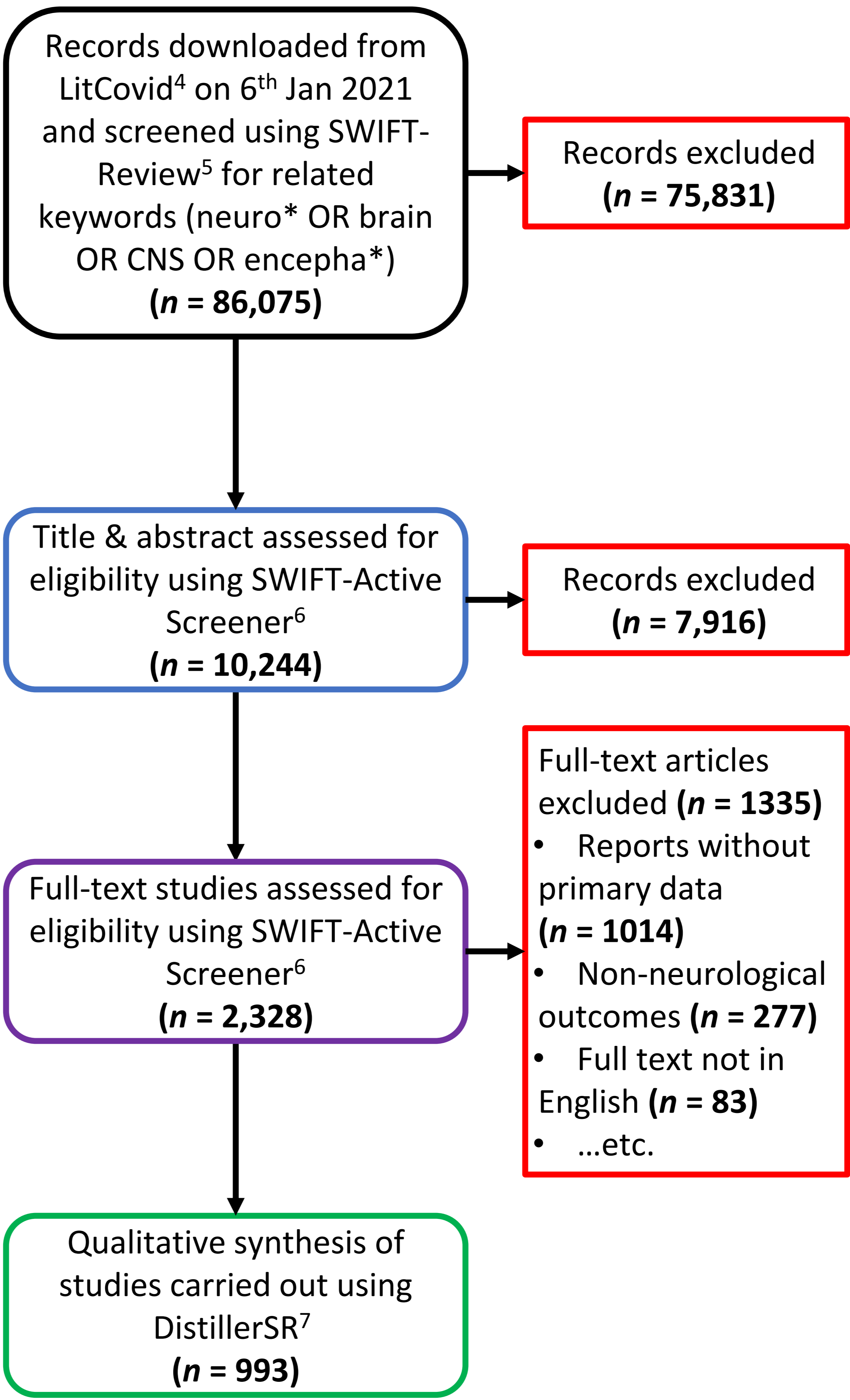

About the CIAO Literature Review Group

- A systematic review is a standardised approach to search for, appraise, and analyse evidence in answer to a focused research question.

- This systematic scoping review is led by the Evidence-Based Toxicology Collaboration and is conducted according to the principles of Evidence-based Toxicology[2].

- The goal of this systematic scoping review was to identify and organise the available literature on mechanisms that cause the central nervous system/neurological consequences of COVID-19 and identify potential gaps in knowledge.

- Information extracted from the review may be useful to further develop or support neurological AOPs related to COVID-19.

- The protocol has been published and the general approach may be useful for other research areas[3].

Protocol of Systematic Evidence Map[3]

Records downloaded from LitCovid[4] on 6th Jan 2021 and screened using SWIFT-Review[5] for related keywords (neuro* OR brain OR CNS OR encepha*) (*n* = 86,075)

→ Records excluded (*n* = 75,831)

Title & abstract assessed for eligibility using SWIFT-Active Screener[6] (*n* = 10,244)

→ Records excluded (*n* = 7,916)

Full-text studies assessed for eligibility using SWIFT-Active Screener[6] (*n* = 2,328)

→ Full-text articles excluded (*n* = 1335)
- Reports without primary data (*n* = 1014)
- Non-neurological outcomes (*n* = 277)
- Full text not in English (*n* = 83)
- …etc.

Qualitative synthesis of studies carried out using DistillerSR[7] (*n* = 993)

Current Status

- Extraction of study characteristics using Evidence Partners DistillerSR software with custom extraction forms is underway[7].

- Each study is extracted by an individual reviewer then assessed for quality control.
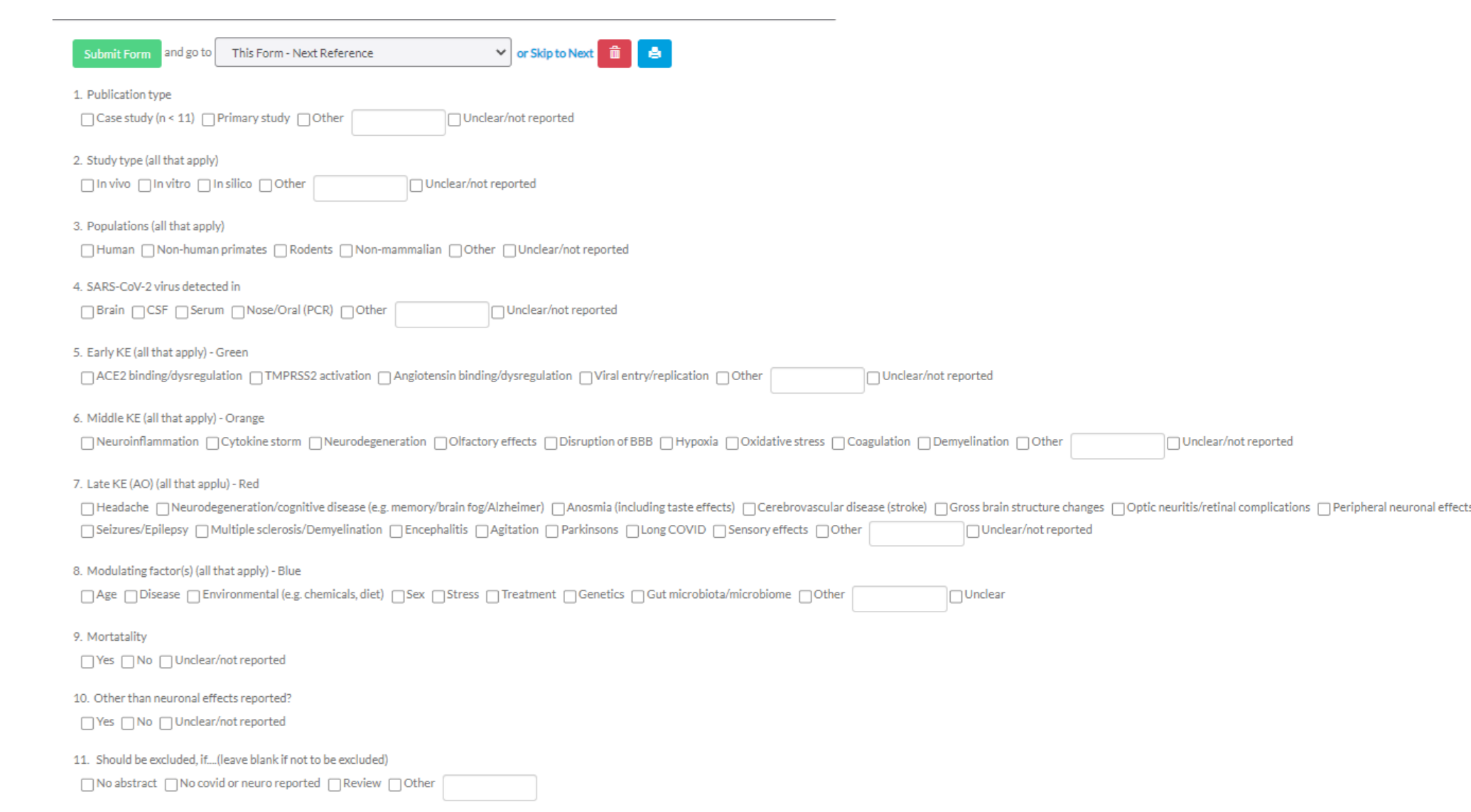
Next steps

- The protocol may be adapted to other organs for use within the other CIAO working groups.

- The extracted information will be visualised in a publicly available, interactive database.

- Results of the evidence mapping will be published and all data made available.

- The group are also exploring innovative, more efficient approaches to systematic review.

References: 1. https://www.ciao-covid.net/. 2. Hoffmann, S. *et al*. A primer on systematic reviews in toxicology. Arch. Toxicol. 91, 2551–2575 (2017). 3. Systematic scoping review of the literature of the neurological effects of SARS-CoV-2 – Open Science Framework - https://osf.io/58swg/. 4. LitCovid - https://www.ncbi.nlm.nih.gov/research/coronavirus/. 5. SWIFT-Review, Sciome https://www.sciome.com/swift-review/. 6. SWIFT-Active Screener, Sciome https://www.sciome.com/swift-activescreener/. 7. DistillerSR https://evidencepartners.com/.