

Tobacco smoking changes during the first pre-vaccination phases of the COVID-19 pandemic: A systematic review and meta-analysis.

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Conclusions

This is the first systematic review of smoking changes during the COVID-19 pandemic, capturing studies published within the early months of the outbreak. Smoking behaviour changes during the early phases of the COVID-19 pandemic were highly heterogeneous. Meta-analyses indicated slightly lower overall smoking prevalence during the pandemic. Approximately, 50% smokers did not change their smoking habits, but the proportion of smokers who smoked more (27%) was higher than the proportion who smoked less (21%). There were not enough studies to examine sub-group analyses by, for example, sex or age. The scope of this review was focused on population level changes, and not on specific targeted groups that are known to be at high risk. Updates of this review are planned to assess longer term changes during the pandemic and consolidate high-quality evidence from representative surveys.

Background

Globally, tobacco smoking is a major cause of disease burden worldwide, yet its prevalence remains high. The COVID-19 pandemic has forced nations to take unprecedented measures including 'lockdowns' that might impact tobacco smoking behaviour. Given the long-term impact of smoking behaviours on the future burden of disease, knowledge of smoking behaviour changes during the COVID-19 pandemic is important for informing recovery and preventive health efforts. We aimed to perform a systematic review and meta-analyses to assess smoking behaviour changes during the first pre-vaccination phases of the COVID-19 pandemic.

Results

The meta-analyses of change in the prevalence of smoking, and the prevalence of increased, decreased, uptake of, cessation of, attempts to quit and intention to quit smoking during compared to before the pandemic are shown in the table below.

Prevalence among all respondents (%)				
Outcome	Number of participants	Number of studies	Pooled effect estimate (95%CI)	I ² (p-heterogeneity)
Smoking prevalence ratio (during vs before)	125,246	12	0.87 (0.79-0.97)	99.3% (<0.001)
Prevalence among smokers only (%)				
Smoked less	22,335	17	21% (14-30%)	99.4% (<0.001)
Smoked more	23,805	22	27% (22-32%)	98.5% (<0.001)
Same amount	22,690	17	50% (41-58%)	99.2% (<0.001)
Stopped smoking	4,184	6	4% (1-9%)	94.8% (<0.001)
Decreased motivation or desire to quit	1,137	2	12% (10-14%)	Not calculable
Increased motivation or desire to quit	1,137	2	21% (18-23%)	Not calculable
Attempted to quit	180	1	37% (33-40%)	Not calculable
Prevalence among non-smokers only (%)				
Started smoking	10,341	4	2% (1-3%)	91.7% (<0.001)

An example of the meta-analysis for change in the prevalence of smoking during compared to before the pandemic is shown in the figure on the right.

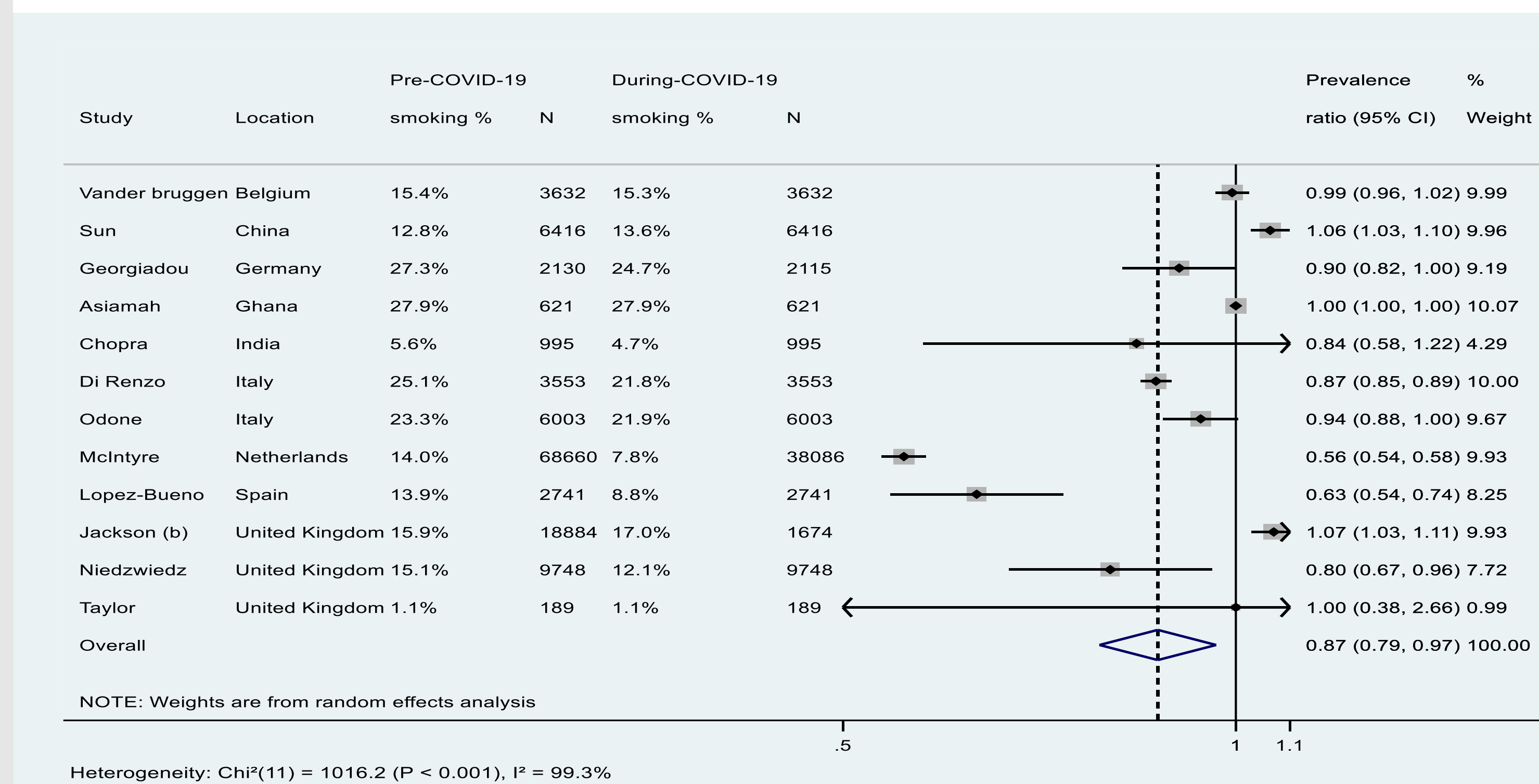
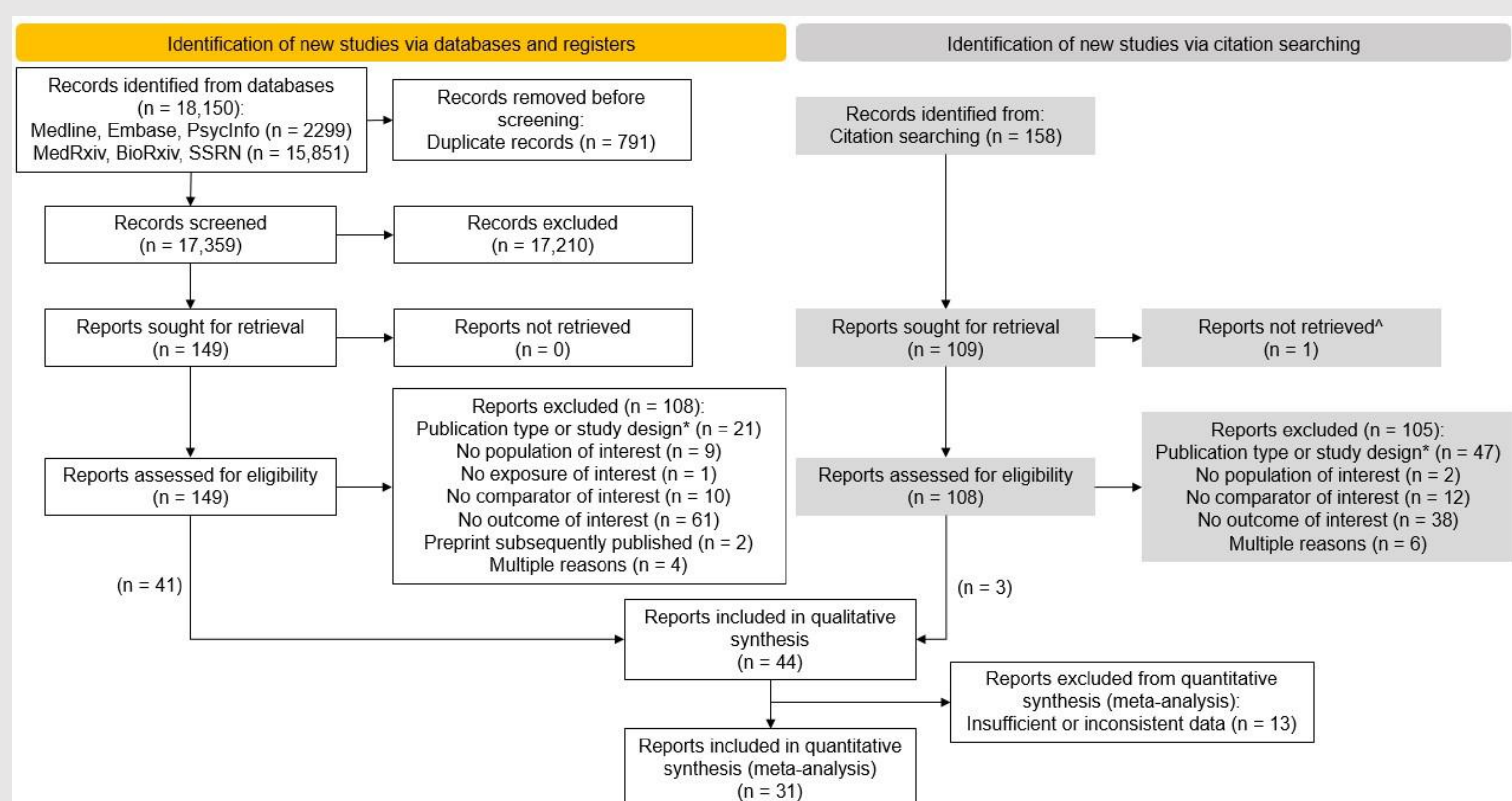
Risk of bias was high in almost all studies. A major source of bias was non-representativeness of the target population. Other sources of bias included not reporting the wording of questions, asking for participants' impression of increased/decreased smoking (rather than assessing actual increases/decreases in smoking intensity), incorrect calculations, and not reporting standard errors or confidence intervals for estimates.

Methods

We performed a literature search up to 5 November 2020. Published and pre-print articles were extracted from Medline, Embase, PsycINFO, BioRxiv, MedRxiv, and SSRN databases. Study selection and data extraction were performed in duplicate. Two tools were adapted and used to assess risk of bias. For cross-sectional studies a tool for prevalence studies was used, while for controlled and uncontrolled before-and-during studies the ROBINS-I tool was used.

For the quantitative synthesis, we used random-effects models to pool prevalence ratios comparing the prevalence of smokers during and before the COVID-19 pandemic, and the prevalence of increased, decreased, uptake of, cessation of, attempts to quit and intention to quit smoking during compared to before the pandemic.

The PRISMA flow diagram is shown in the figure below.



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