

Topic duplication and research waste at the 'Overviews of systematic reviews' level: Survey of overlapping overviews

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Abstract

Background

Multiple overviews of systematic reviews conducted on the same topic (“overlapping overviews”) represent a waste of research resources and can confuse or mislead clinicians and policymakers. We aimed to assess the frequency and characteristics of published overviews addressing the same clinical question or topic.

Methods

We used MEDLINE, Epistemonikos and Cochrane databases to locate overviews that: focused on synthesising reviews; conducted systematic searches; had a methods section; and examined a health intervention or clinical treatment. We then determined which overviews addressed the same or overlapping populations/settings, interventions, and outcomes [PIO]). Overlap in topic was defined as: duplication of PIO elements, not representing an update of a previous overview, and not a replication for quality purposes.

Results

Of 541 overviews located (2000–2018), 178 (33%) overlapped with another overview addressing a similar PIO. The topics of overlapping overviews fell within 13 WHO ICD-10 medical classifications, and there were 65 overlapping topics in total. The most prevalent topic with overlap across 7 overviews was smoking cessation (pharmacologic and non-pharmacologic interventions). Five overlapping overviews related to acupuncture for pain, 5 addressed cannabinoids for pain and symptoms, and 5 addressed exercise for bone and muscle health. For 15/65 (22%) of these topics, one author was involved in at least two of the overlapping overviews.

Conclusions

We found significant duplication and unnecessary overlap across overviews. To avoid waste and redundancy, protocols of overviews should be registered in a targeted database, and overviews should cite other studies on similar topic with a rationale.

Background

High-quality ‘overviews of reviews’ and systematic reviews give the best perspective of our current state of evidence on a subject. ‘Overviews of systematic reviews’ (henceforth called overviews) synthesize the results of multiple systematic reviews and help inform evidence-based clinical practice. Overviews are one of the multiple types of evidence syntheses. They are growing in number and popularity, and our

bibliometric study of the prevalence of overviews found an 8-fold increase in the number of overviews between 2009 (n = 25) and 2020 (n = 332) number [1]. The growth in overviews is unlikely to decrease [1].

Several author teams have expressed concerns about the volume of systematic reviews published which are overlapping in content [2–4]. Conflicting results or conclusions across systematic reviews on the same topic confuse and possibly mislead clinicians and policymakers [5]. These concerns can be extrapolated to overviews. Duplicate overviews on the same topic represent wasted efforts on the part of investigators and peer reviewers.

Overviews have the potential for overlap because many are broad in scope, thus covering several specific topics. These broad overviews often address less specific research questions than their constituent systematic reviews, including a wider range of study populations and conditions, interventions, and contexts. Overviews that are broad in scope allow for policy relevance; for example, overviews have informed clinical practice guidelines (e.g. [6]) and government health policies (e.g. Australian Government Department of Health, 2015 [7]). Broad overviews can make a large volume of evidence accessible to clinicians and policy makers [8], but may necessitate extensive screening, data extraction, and the synthesis of a large number of systematic reviews.

Overviews may alternatively aim to answer narrow, focused clinical questions, and to identify and explore reasons for variation in the results, interpretation, or conclusions of systematic reviews analysis [9–18]. As an example, an overview that compared surgical and conservative treatments for clavicle fractures aimed to determine which systematic review provided the most trustworthy evidence for treatment, and explored reasons for differences in review-level results [16]. Overviews with narrowly focused research questions can be completed more quickly as compared with broad research questions, but may have limited generalizability to different populations and scenarios [19].

Research is needed to establish whether overviews are performed on unique topics; represent updates of previous overviews done by the same team of authors; or pertain to topics that attract attention of different teams who independently perform and publish their overviews. In this second of two companion papers, we aimed to assess how common it is to have overviews of systematic reviews (overviews) published on the same topic, henceforth referred to as overlapping overviews.

Methods

2.1. Study design

This is a methods study in the knowledge synthesis field. We followed systematic review guidance for the searching, study selection, and data extraction stages of our review [20].

2.2 Eligibility criteria

As described in our first companion paper, we performed a bibliometrics study of overviews published in MEDLINE (Ovid), Epistemonikos, and the Cochrane Database of Systematic Reviews. We included

overviews meeting the following selection criteria:

- • Synthesises systematic reviews with or without meta-analyses (but the overview may also include primary studies) as a primary focus.
- • Searches the literature systematically, and with a search strategy section found in the main body of the paper (i.e. search strategy includes text words and MeSH terms in at least two databases).
- • Methods section located in the main body of the paper (not just in the abstract).
- • Focuses on the effects of health interventions or clinical treatments.

We excluded overviews that based their results exclusively on primary studies and methodological studies. Reports that were editorials, letters, or comments were excluded. Overviews of risk, exposure, prevention, measurement instruments, quality indicators, diagnostic, screening or prognostic research were also excluded. We excluded protocols of overviews.

We included overviews published in any language and published from January 1, 2000 to December 31, 2018. Given that the Cochrane Handbook chapter on overviews was first published in 2009, we did not expect to identify overviews published prior to 2000. Reports were translated by one of the authors (French, Spanish, German, Mandarin), when needed.

We reasoned that overviews may exist as a stand-alone report or also packaged as part of a clinical practice guideline and health technology assessment; accordingly, we developed eligibility criteria for both circumstances.

Inclusion criteria for clinical practice guidelines and health technology assessments (HTAs):

- Clinical practice guidelines or HTA aims to primarily include, synthesise and present the results of the systematic reviews; but may also include primary studies.

Overlapping overviews eligibility criteria

We determined if two or more overviews were overlapping in topic if they investigated the same population(s), intervention(s), and at least one outcome. We did not consider an update by the same authors, or if the authors stated the overview was a replication, as an overlapping overview.

2.3 Search

Overviews were retrieved using a validated search filter [21] from MEDLINE (Ovid), Epistemonikos and the Cochrane database of systematic reviews (**Appendix A**). The Epistemonikos search was limited to the “Broad Syntheses” category which includes overviews of systematic reviews, HTAs and clinical practice guidelines.

2.4 Overview screening and study selection

The initial search results were imported into Excel 2010 for screening. A pilot screening of the first 19 papers was conducted in duplicate by all screeners to ensure high levels of agreement and common definitions of coding. We screened the titles and abstracts against the stated eligibility criteria first, then eligible full-text articles were reviewed for inclusion. Two independent reviewers screened reports at the title and abstract, and then again at the full text stage, then compared their results. Discrepancies were resolved by consensus, and arbitration by a third reviewer when necessary.

In a previously published study, 187 overviews (2013 and 2016) were screened [21, 22] using identical methods (Appendix A). We therefore included these 187 studies and categorized them as “other sources”.

2.5 Data extraction

We extracted data on overviews published between 2000 and 2018. Data extraction was piloted on 20 studies by all authors independently to identify any missing variables, come to agreement on coding definitions, and refine/reword the items. Discrepancies in the piloting phase were discussed and consensus reached by two authors. Full data extraction was performed independently by one investigator, and checked by a second reviewer.

We categorized the medical classification of each overview using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD), a medical classification list by the World Health Organization (WHO) (<https://www.who.int/standards/classifications/classification-of-diseases>). The main condition or intervention in the title of the overview was entered into the search function of the WHO ICD-10 site (<https://icd.who.int/browse10/2016/en>) to determine its classification). For example, the title “Nonpharmacological *treatment for behavioural and psychological disturbances* in older adults with dementia” was categorised in the ICD-10 classification “Mental and behavioural disorders” because the intervention was treatment for behavioural disturbance in a dementia population. In addition to ICD-10 classification, the topic of each overview was determined through review of the clinical question, including study population(s), intervention(s), and outcome(s).

For overlapping overviews, we additionally extracted whether an author was involved in more than one overview on the same topic. We also noted the journal of publication, number of included systematic reviews, search date; inclusion of meta-analysis; and funding status.

2.6 Data analysis

Descriptive analysis using frequencies and percentages were performed for categorical data and median and interquartile range (IQR) for continuous data.

The distribution of total overviews by medical classification was plotted in a bubble chart using Excel. The x axis represents medical classification, y axis the number of overviews pertaining to that medical classification and the size of the bubble (third variable) represents the cumulative number of systematic reviews in all overviews included in that classification. We described the gaps in ICD-10 medical

classifications covered by all overviews published between 2000 and 2018. We also charted the number of overviews covering a topic related to complementary and alternative medicines (CAM).

Results

3.1. Search results

After searching MEDLINE, Cochrane, Epistemonikos and other sources we retrieved 10,145 records (Fig. 1). After removal of duplicates, 8220 records remained, 6733 were excluded at the title/abstract stage, and 946 were excluded at the full text stage. A total of 541 overviews published between 2000 and 2018 were included (**Appendix B**). Many of the citations were excluded because they did not have a methods section, did not conduct a systematic search, and did not search for and include systematic reviews (Fig. 1).

3.2 WHO ICD-10 Medical Classifications

The 541 overviews covered 20 of the 22 WHO ICD-10 Medical Classifications (Fig. 2). The most frequent ICD-10 classification for retrieved overviews (92/541 [17%]) was “factors influencing health status and contact with health services.” Another 62/541 (11.5%) focused on diseases of the musculoskeletal system and connective tissue, 56/541 (10.4%) were about mental and behavioural disorders, 42/541 (7.8%) were on diseases of the circulatory system, and 34/541 (6.3%) were focused on neoplasms (Figs. 2 and 3). A little under half of the overviews focused on 15 other ICD-10 medical classification (Fig. 3 and Table 1).

Table 1
Frequency of WHO ICD-10 Medical Classifications in 541 overviews

WHO ICD-10 Medical Classifications	Frequency of overviews	Percent (%)
Blood and blood-forming organs	3	0.55
Certain conditions originating in the perinatal period	7	1.29
Certain infectious and parasitic diseases	22	4.07
Codes for special purposes	12	2.22
Congenital malformations, deformations and chromosomal abnormalities	0	0
Diseases of the circulatory system	42	7.76
Diseases of the digestive system	24	4.44
Diseases of the ear and mastoid process	0	0
Diseases of the eye and adnexa	5	0.92
Diseases of the genitourinary system	26	4.81
Diseases of the musculoskeletal system and connective tissue	62	11.46
Diseases of the nervous system	27	4.99
Diseases of the respiratory system	27	4.99
Diseases of the skin and subcutaneous tissue	7	1.29
Endocrine, nutritional and metabolic diseases	19	3.51
External causes of morbidity and mortality	23	4.25
Factors influencing health status and contact with health services	92	17.0
Injury, poisoning and certain other consequences of external causes	19	3.51
Mental and behavioural disorders	56	10.35
Neoplasms	34	6.28
Pregnancy, childbirth and the puerperium	9	1.66
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	25	4.62
Total	541	100.00

3.3 Gaps in WHO ICD-10 Medical Classifications across 541 overviews

The WHO ICD-10 medical classification has 22 classifications in total. Zero of 541 overviews were found for two WHO ICD-10 Medical Classifications, namely 'congenital malformations, deformations and chromosomal abnormalities' and 'diseases of the ear and mastoid process' (Table 1).

3.4 Overlapping overviews according to medical classification and topic

Of 541 overviews published from 2000 to 2018, 178 (33%) had at least one other overlapping overview (median 2 overviews per topic, interquartile range 2–3, maximum 7). Of the 178 overlapping overviews, 44 (25%) were published in 2017, 41 (23%) were published on or before 2010, 18 (10%) in 2018, 17 (10%) in 2011, and 15 (8%) in 2015.

Overlap in ICD-10 Medical Classifications

The 178 overlapping overviews fell under 13/22 (59%) WHO ICD-10 Medical Classifications (specifically, certain conditions originating in the perinatal period; circulatory system diseases; codes for special purposes; digestive system diseases; endocrine, nutritional and metabolic diseases; external causes of morbidity and mortality; factors influencing health status and contact with health services; genitourinary system diseases; mental and behavioural disorders; musculoskeletal system and connective tissue diseases; nervous system diseases; respiratory system diseases; symptom, signs and abnormal clinical and laboratory findings, not elsewhere classified; **Appendix C**). The greatest number of overlapping overviews were classified under "factors influencing health status and contact with health services" (40/178 [22%]), followed by "musculoskeletal system and connective tissue diseases" (36/178 [20%]), and "symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" (23/178 [13%]).

Overviews with overlapping patient(s), intervention(s) and/or outcome(s)

A total of 65 topics involving one, or a combination of, overlapping patient(s), intervention(s) and outcome(s) were covered more than once by the 178 overlapping overviews (Table 2). The most prevalent topic that overlapped across seven overviews pertained to interventions for smoking cessation (pharmacologic and non-pharmacologic). Five overviews focused on acupuncture for pain, five on the topic of cannabinoids for pain and symptoms, and five on exercise therapy for bone and muscle health. Ten topics were covered by four overviews each, 15 topics were covered by three overviews each, and 36 topics were covered by two pairs of overviews (Table 2).

Table 2
 Overviews with overlapping patient(s), intervention(s) and/or outcome(s) (n = 178)

Overlapping patient(s), intervention(s) and/or outcome(s)	Frequency	Percentage
Acupuncture for management of pregnancy-related symptoms	2	3.08
Acupuncture for managing gynaecologic conditions	3	4.62
Acupuncture for pain	5	7.69
Acupuncture for palliative care of cancer	3	4.62
Acute asthma management in children	2	3.08
Antipsychotic drugs for schizophrenia	3	4.62
Assisted reproductive technologies (ARTs)	2	3.08
Behavioral Counseling and Pharmacotherapy Interventions for Tobacco Cessation	7	10.77
Cannabinoids for pain, and symptoms	5	7.69
Childhood obesity interventions	2	3.08
Chronic treatment in childhood asthma	2	3.08
Complementary and alternative procedures for fibromyalgia	3	4.62
Cupping	2	3.08
Diets to reduce weight and obesity	3	4.62
Effects of coffee	2	3.08
Effects of financial arrangements for health systems in low-income countries	2	3.08
Exercise therapy	5	7.69
Exercise to relieve fatigue	2	3.08
Exercise to relieve pain	4	6.15
Food supplements for body weight reduction	2	3.08
Ginkgo biloba for dementia	2	3.08
Hip fracture pre-op management and rehabilitation	2	3.08
Influenza vaccination	3	4.62
Interventions for improving patient quality of life	2	3.08
Interventions to treat complex wounds	3	4.62
Knee osteoarthritis - physical therapy	2	3.08

Overlapping patient(s), intervention(s) and/or outcome(s)	Frequency	Percentage
Lung cancer cost effectiveness analysis	2	3.08
Lung cancer treatment	2	3.08
Lupus nephritis treatment	2	3.08
Mammography screening	2	3.08
Management of hip and knee osteoarthritis	2	3.08
Manual therapy for the treatment of migraine	2	3.08
Neuraminidase inhibitors for influenza	2	3.08
Non-pharmacological interventions for insomnia	2	3.08
Non-pharmacological interventions for osteoarthritis	3	4.62
Nonpharmacological treatment for behavioural and psychological disturbances	4	6.15
Non-pharmacological treatment for cancer-related fatigue	2	3.08
Opioid use in non-cancer pain	3	4.62
Over-the-counter analgesics for pain	4	6.15
Periodontal treatment and glycaemic control	2	3.08
Periodontal treatment and preterm birth rate	2	3.08
Pharmacologic treatment of low back pain	3	4.62
Pharmacological interventions for smoking cessation	2	3.08
Pharmacological treatments for major depressive disorder	2	3.08
Pharmacological treatments for major depressive disorder	4	6.15
Pharmacological, non-pharmacological, and surgical treatments of low back disorders	4	6.15
Physical activity promotion in children and adolescents	3	4.62
Physiotherapy exercise	2	3.08
Preterm birth	3	4.62
Promoting healthy behaviour by communicating disease risk	2	3.08
Psychotherapy and non-medication-based interventions	3	4.62
Physiotherapy and exercise	2	3.08
Reduction interventions of alcohol intake	4	6.15

Overlapping patient(s), intervention(s) and/or outcome(s)	Frequency	Percentage
Rheumatoid arthritis – non-pharmacological interventions	2	3.08
Rheumatoid arthritis - pharmacological interventions	2	3.08
Rotator cuff repair surgery rehabilitation	2	3.08
Spinal manipulation	4	6.15
Surgical treatment of low back pain	4	6.15
Therapy for fibromyalgia syndrome	3	4.62
Treatment for multiple myeloma	2	3.08
Treatment of procedural pain in children	2	3.08
Treatment of venous thromboembolism with LMWH and UFH	4	6.15
Urinary incontinence	3	4.62
Vitamin D supplementation	4	6.15
Web-based interventions for weight loss	2	3.08

Across all overlapping topics, 14 related to the benefits of physical activity in different populations (older adults, children, people with diseases), and 7 related to complementary and alternative medicines (CAM) for various conditions. **Appendix C** lists the 178 overviews that overlapped for the 65 topics with their WHO ICD-10 medical classification, population, interventions, and outcomes.

Authors who publish overviews on similar topics

In 11/65 (17%) topics, at least one author was involved in two or more of the overviews that overlapped. These duplicated overviews had partially overlapping participants, interventions, outcomes, and indications/settings. Of two broad overviews on spinal manipulations [23, 24], the 2011 overview was written by two authors, and a year later, one of these authors published an overview with the same populations, intervention, and outcomes.

Characteristics of overlapping overviews Some overlapping overviews were particularly broad in scope and considered several drugs or interventions, while some of the other overviews on the same topic considered only one of these interventions (e.g. [25, 26]). For example, an overview by Kelly et al. entitled “Exercise and sleep: a systematic review of previous meta-analyses” was conducted which included studies with participants with certain conditions (obstructive sleep apnea, cancer) [27], and the second overview by the same authors focused on cancer-related fatigue entitled “Exercise and cancer-related fatigue in adults: a systematic review of previous systematic reviews with meta-analyses” [28]. Many overlapping overviews contained overlapping outcomes such as all-cause mortality, body weight, different definitions of pain, and adverse events.

We also found that a specific population in one overview could overlap with an overview considering a broader patient population on the same topic (e.g. [29, 30]). For spinal manipulations, there were two overviews that considered any type of pain [23, 24] and two that focused on specific pain (headache [31] and chronic low back pain [32]).

Discussion

Summary of results

This is the first study to examine overlap across a cohort of overviews. Our methodological assessment identified 33% of overviews dated between 2000 and 2018 that overlapped in content across 13 WHO ICD-10 medical classifications. Sixty-five topics or clinical questions had two or more overlapping overviews. As many as 7 overviews (median of 2) were completed on the same topic (e.g. regarding smoking cessation) representing significant unnecessary and redundant overlap. We found that it was common for some overlapping overviews to cover broad topic areas, whereas others considered only subsets of the evidence. We conclude that some of the observed overlap in our sample seems unnecessary and reflects wasted effort, resources, and inefficiency.

Coverage and gaps in ICD-10 Medical Classifications

The 541 overviews we included pertained to 20 of the 22 WHO ICD-10 Medical Classifications. The most prevalent classification was “factors influencing health status and contact with health services,” “diseases of the musculoskeletal system and connective tissue”, and “mental and behavioural disorders”. Gaps in overview topics were found in two of the WHO ICD-10 classifications “congenital malformations, deformations and chromosomal abnormalities”, and “diseases of the ear and mastoid process”. This study and database of overviews can provide a guide to authors about which topics are covered, and gaps in the evidence for future analysis.

Legitimate reasons for observed overlap

Observed overlap can be legitimately justified for several reasons. Overviews may be out-of-date and therefore an update including more recent studies published is needed. This reason is justified especially when systematic reviews on the topic are inconclusive, and their synthesis may reconcile discrepancies in their results, interpretation and conclusions. A duplicate overview may be warranted when an older overview used inappropriate or invalid methods, or was of low methodological quality. Other factors that lend to decisions to conduct an overview on a duplicated topic can include methodological considerations (e.g. if whether re-assessments of risk of bias, re-analyses of data, or (re)evaluation of GRADE assessments are required), or overviews with a broader scope than narrowly focused overviews. A rationale for why an overlapping overview is needed should be provided by the authors.

Finally, replication is also a good reason to conduct an overview with the same or similar PIO.

Reproducibility of research by independent and conflict-free academics to obtain the same (or similar) results when repeating an experiment or test is one of the hallmarks of good science [33]. With replication

and duplication of the same research results, decision makers, healthcare workers and patients can be confident in the consistency and trustworthiness of the research [34]. Dr Moher recently suggested two to three systematic reviews were a sufficient number to ensure replicability but four or more represented unnecessary duplication and research waste [34].

Potential for discrepant results and conclusions across overlapping overviews

We would hope that overviews on the same topic would find the same results and come to similar conclusions, but this is often not the case with systematic reviews [12, 35–37]. Potential discrepancies can cause endless debates (e.g. [38]), and confuse and possibly mislead clinicians and policymakers [5]. Avoidance of this problem is the responsibility of researchers thinking about conducting overviews, funders, and publishers of this type of research.

Potential solutions and recommendations

To avoid unnecessary redundancy, several strategies can be used. First, protocols of overviews should be registered in a targeted database; second, journal editors and peer reviewers, funders and commissioners should require acknowledgement of other similar overviews and scrutinize the rationale where a de novo overview is proposed, rather than repurposing or updating an existing overview; and third, authors should cite the other known overviews that overlap in scope with a clinical or methodological rationale as to why the study is needed [39]. Authors wishing to conduct an overlapping overview should be clear about why a duplicate overview is needed. We do not advocate that authors conduct ‘meta-overviews’ (i.e. overviews of overviews) to try and explain differences in results across multiple overviews.

Currently, there is no dedicated database registry for protocols of overviews, such as there is for systematic reviews (i.e. PROSPERO). A dedicated database for overview protocols, as well as the development of a MeSH term for overviews would help in their identification by prospective overview authors, who when finding a similar overview, could choose a different topic to explore. A published search filter for overviews [21] can help in their identification, as would imbedded filters in databases such as Epistemonikos, MEDLINE, and Embase. The Cochrane Database of Systematic Reviews attempts to avoid duplication of effort by publishing only one overview and systematic review per topic of interest. Other journals should follow suit and avoid duplicate publication of overviews with similar PIOs.

During the protocol phase and conduct of the overview, guidance [40] and methodological studies [41–44] should be consulted by to ensure rigor and a consistently high level of quality. Overviews of high quality will reduce the need for overlapping overviews and aid in avoiding wasting researchers’ time, effort and money.

Strengths and limitations

Despite the growing popularity of overviews as a method to synthesise systematic reviews, to our knowledge this is the first study to examine overlap across a cohort of overviews. A strength of our research is that we based our methods on systematic review guidance, and searched using a validated

search strategy for overviews. We selected the overviews based on stringent eligibility criteria using two independent reviewers, who then compared their results and identified and resolved discrepancies.

One of our major limitations was classifying overlapping topics in overviews. Many broad overview topics could have been classified under several ICD-10 classifications. For example, the overview entitled “Melatonin for health” was classified under “Mental and behavioural disorders” due to the primary theme of its outcomes (sleep latency, pre-operative anxiety, prevention of agitation and risk of breast cancer). This same overview could have also been classified under the ICD-10 classification “Factors influencing health status and contact with health services”.

Conclusions

Our empirical evaluation identified duplication in 33% of overviews dated between 2000 and 2018. Sixty-five topics across 13 WHO ICD-10 medical classifications had overlapping overviews. As many as 7 overviews addressed the same topic (e.g. interventions for smoking cessation) representing significant unnecessary and redundant overlap. A multiplicity of overviews on the same topic adds to the ongoing waste of research resources, time and effort across medical disciplines. To avoid duplication of research and redundancy, protocols of overviews should be registered in a targeted database, and overviews should cite other studies on similar topic with a rationale. This study and database of overviews provides a guide to authors about which topics are covered, and gaps in the evidence for future analysis.

Highlights

- Overviews synthesise the results of multiple systematic reviews.
- This is the first study to examine overlap across a sample of overviews.
- Of 541 overviews published from 2000- to 2018, 178 (33%) were considered overlapping in topic with another overview.
- Over 11/65 (17%) overlapping health topics, at least one author was involved in two or more overlapping overviews.
- We do not advocate that authors conduct ‘meta-overviews’ (i.e. overviews of overviews) to try and explain differences in results across multiple overviews.
- To avoid duplication of research and redundancy, protocols of overviews can provide a guide to authors about which topics are covered and
- To avoid overlap, a dedicated database for overview protocols, as well as the development of a MeSH term for overviews would help in their identification by prospective overview authors
- Overlapping overviews, without warranted rationale, represent wasted efforts on the part of investigators and can confuse and mislead clinicians and policymakers.

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Declarations

Ethics approval and consent to participate

N/A

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Transparency declaration

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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Data sharing and availability of data and materials

All data is in the supplementary files.

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Competing interests

The authors have declared no competing interest.

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Dissemination declaration

The results will be disseminated in conference and university workshops, social media, and email lists.

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Authors' contributions

CL conceived of the study design, wrote the study protocol, extracted and analyzed the data, wrote and revised the final manuscript. GS, YWZ, CL, LL, PHY, MD, PN screened citations and full-text articles. CL and JHZ abstracted and analysed the data. CL, JZ, TN, AC, GS, AS, ST, SS, SA, YWZ, LL, PHY, MD, PN, UE, BJS, EKR, and JMW edited and approved of the final manuscript,

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Figures

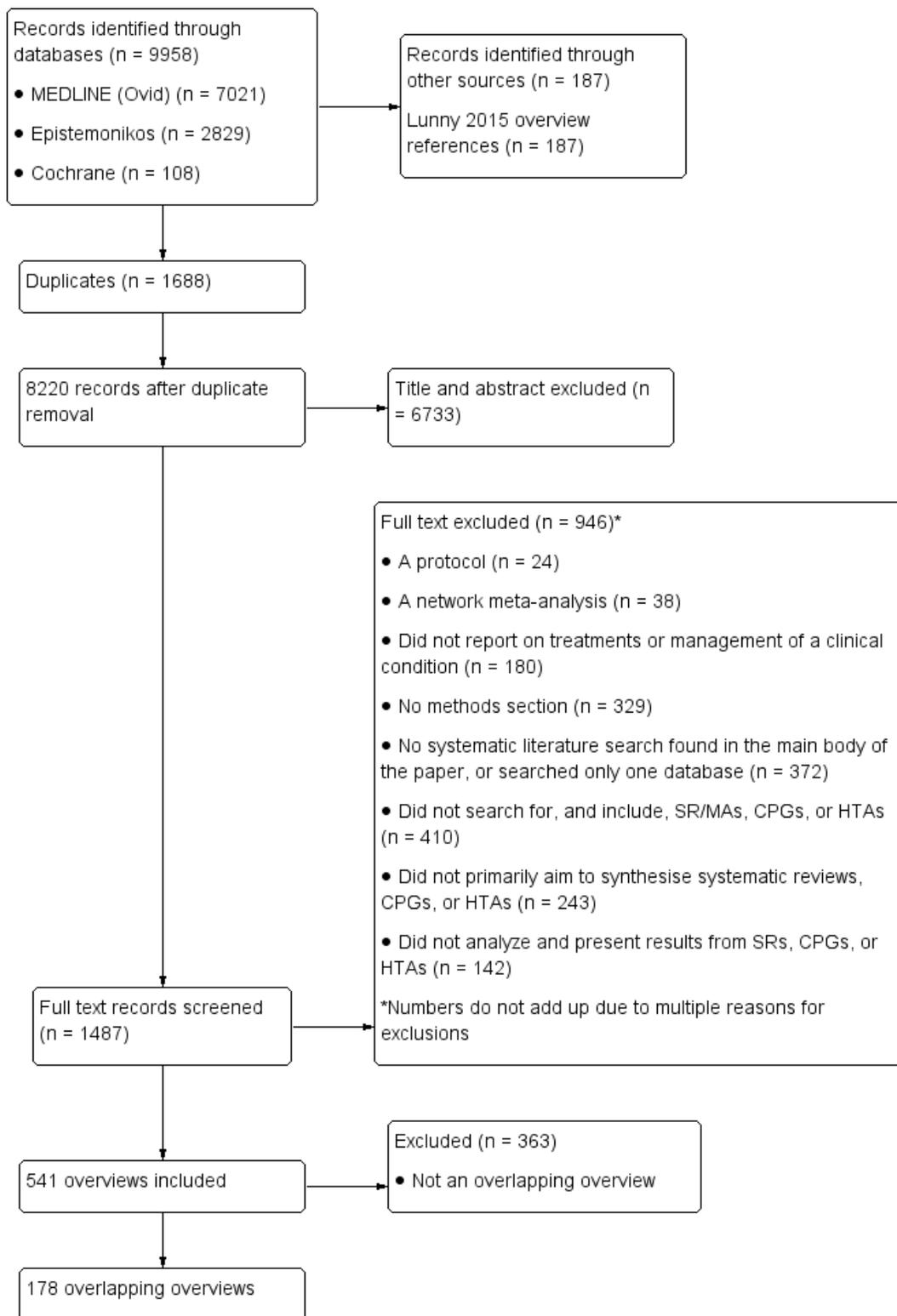


Figure 1

PRISMA flowchart of study selection

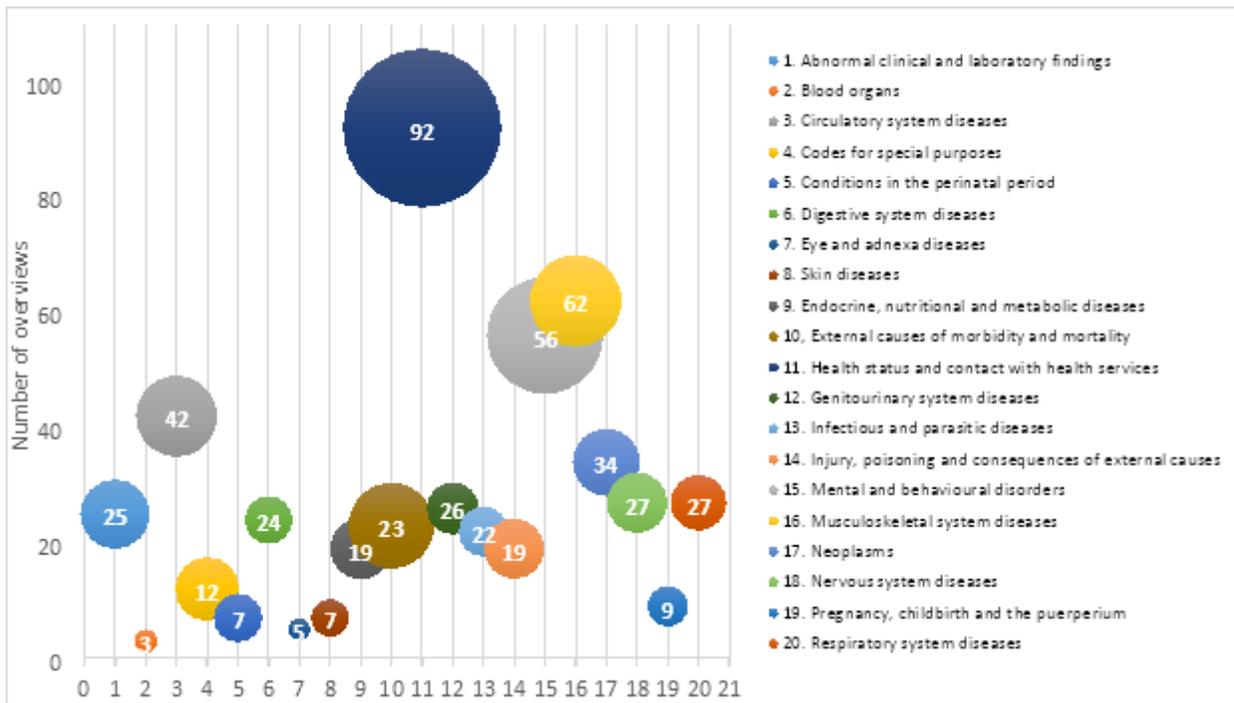


Figure 2

Bubble chart of WHO ICD-10 Medical Classifications and overview frequency. Legend: Bubble chart depicts the ICD-10 Medical Classifications by colour, the y axis is the number of overviews, the x axis is the 20 WHO ICD-10 Medical Classifications, and the size of the bubble (third variable) represents the cumulative number of systematic reviews included in the overviews. For example, the most prominent bubble is dark blue in the top center covering the most frequent ICD-10 classification “Factors influencing health status and contact with health services” (n=92/541 [17%]).

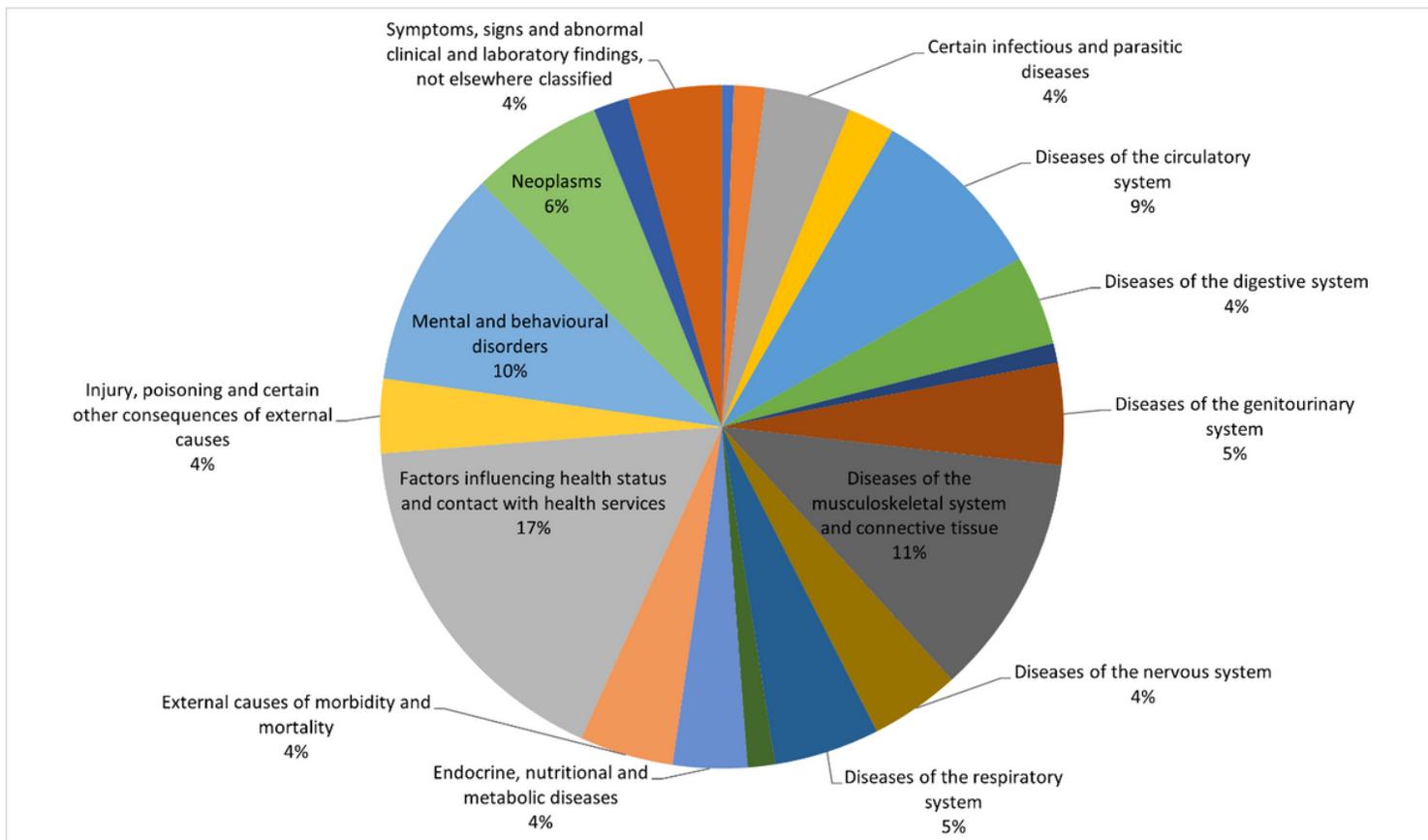


Figure 3

Proportion of overviews by medical classification

Supplementary Files

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- [AppendixAandB.docx](#)