

Appendix

Appendix 1: Search strategy

Database	Search Strategy	Filters/Notes
Global Health	("Elder Abuse" OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse")	Filter by publication year (2000-2025).
Web of Science	TS=("Elder Abuse" OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse")	Filter by publication year (2000-2025) and document type (e.g., articles).
Global Index Medicus	("Elder Abuse" OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse")	Filter by publication year (2000-2025).
CINAHL Plus	(MH "Elder Abuse") OR ("Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse")	Filter by publication year (2000-2025).
PubMed	("Elder Abuse"[MeSH Terms] OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse")	Filter by publication year (2000-2025) and article type (e.g., exclude systematic reviews).
Scopus	TITLE-ABS-KEY("Elder Abuse" OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR	Filter by publication year (2000-2025)

	"Elder Exploitation" OR "Elder Psychological Abuse")	
Embase	('elder abuse'/exp OR 'elder mistreatment' OR 'abuse in older adults' OR 'senior abuse' OR 'older adult abuse' OR 'abuse of the elderly' OR 'elder neglect' OR 'elder exploitation' OR 'elder psychological abuse')	Filter by publication year (2000-2025).
Medline	("Elder Abuse"[MeSH Terms] OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse")	Filter by publication year (2000-2025) .
International Scientific Indexing	("Elder Abuse" OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse")	Filter by publication year (2000-2025).
Google Scholar	"Elder Abuse" OR "Elder Mistreatment" OR "Abuse in Older Adults" OR "Senior Abuse" OR "Older Adult Abuse" OR "Abuse of the Elderly" OR "Elder Neglect" OR "Elder Exploitation" OR "Elder Psychological Abuse"	Filter by custom date range (2000-2025).

Appendix 2:Eligibility criteria for selection of studies in the systematic review

Criteria	Inclusion	Exclusion
Population	Older adults aged 60+ years.	Studies focusing on younger populations or unrelated groups.
Intervention/Exposure	Elder abuse (physical, emotional, financial, sexual, neglect).	Studies focusing on risk factors, health impacts, or interventions.
Comparison	Not required (unless comparing types or prevalence of abuse).	

Outcomes	Prevalence, types, or characteristics of elder abuse.	Studies measuring risk factors, health impacts, or intervention effectiveness.
Study Design	Cross-sectional studies, prevalence studies, descriptive studies.	
Time Frame	Studies published between 2000 and 2025.	Studies published outside this range.
Language	English.	Non-English studies (unless translation is feasible).
Geographic Setting	All regions.	None (unless focusing on specific regions).
Publication Status	Peer-reviewed articles.	Grey literature (unless explicitly included).
Methodological Quality	Low risk of bias as assessed by JBI Critical Appraisal Checklists.	High risk of bias or poor methodological quality.

Appendix 3: Definitions

1. Elder Abuse

- Definition: Elder abuse refers to any intentional or negligent act by a caregiver, family member, or other individual that causes harm or a serious risk of harm to an older adult (aged 60 years or older). It includes physical, emotional, financial, sexual abuse, neglect, and verbal abuse.

2. Types of Elder Abuse

- Physical Abuse: The use of physical force that may result in bodily injury, physical pain, or impairment (e.g., hitting, slapping, pushing).
- Emotional/Psychological Abuse: Infliction of mental pain, anguish, or distress through verbal or non-verbal acts (e.g., humiliation, threats, isolation).
- Verbal Abuse: Involving the use of words, tone, or language to demean, intimidate, or belittle an older adult (e.g., yelling, name-calling, insults).
- Financial Abuse: Illegal or improper use of an older adult's funds, property, or assets (e.g., theft, fraud, exploitation).
- Sexual Abuse: Non-consensual sexual contact of any kind with an older adult (e.g., unwanted touching, sexual assault).
- Neglect: Failure to fulfill caregiving obligations, resulting in harm or risk of harm to the older adult (e.g., withholding food, medication, or basic needs).

Appendix 4:Quality assessment of included studies

Cross-Sectional Study Critical Appraisal (JBI Tool)									
	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	Total
1	Authors' name								
2	(Cations et al., 2021)	1	1	0	1	1	1	1	0 6
3	(De Donder et al., 2011-Austria)	0	1	1	1	1	1	1	7
4	(De Donder et al., 2011-Belgium)	0	1	0	1	1	1	1	6
5	(Santos et al., 2013)	1	1	1	1	0	1	1	7
6	(Blay et al., 2017)	0	1	1	1	1	1	1	7
7	(Santos et al., 2021)	1	1	0	0	1	1	1	0 5
8	(Vida et al., 2002)	0	1	1	0	1	1	1	1 6
9	(Chokkanathan & Mohanty, 2025)	0	1	1	1	1	1	1	7
10	(Wang et al., 2019)	1	1	1	0	1	1	1	7
11	(Du & Chen, 2021)	0	1	0	1	1	1	1	6
12	(Chen & Chan, 2022)	0	1	0	1	1	1	0	1 5
13	(Su et al., 2011)	0	1	1	1	1	1	1	7
14	(Wu et al., 2012)	1	1	0	1	1	1	1	7
15	(Zhang et al., 2023)	1	1	0	0	0	1	1	1 5
16	(Cheng et al., 2025)	0	1	1	0	1	1	1	1 6
17	(Li et al., 2025)	1	1	1	1	1	1	1	1 8
18	(Ajdukovic et al., 2009)	1	1	0	1	1	0	1	1 6
19	(Luzny & Jurickova, 2012)	1	1	0	1	1	0	1	1 6
20	(Luzny & Jurickova, 2012)	1	1	1	1	0	1	1	1 7
21	(Abdel Rahman & El Gaafary, 2012)	1	1	1	1	1	0	1	1 7
22	(Tasisa & Yigezu, 2022)	1	1	1	1	1	1	1	1 8
23	(Wolde et al., 2022)	1	1	0	1	1	0	1	0 5
24	(Fraga et al, 2014—Germany)	1	1	1	1	1	1	1	1 8
25	(De Donder et al., 2011-Finland)	1	1	1	1	1	0	1	1 7
26	(Thomas et la, 2021)	1	1	0	1	0	1	1	1 6
27	(Brijoux et al., 2021)	1	1	1	1	1	0	1	1 7
28	(Fraga et al, 2014—Greece)	1	1	0	1	1	1	1	1 7
29	(Stöckl & Penhale, 2015)	1	1	1	1	1	0	1	1 7
30	(Chokkanathan & Lee, 2005)	1	1	1	1	1	1	1	1 8
31	(Chokkanathan, 2015)	1	1	1	1	1	1	1	1 8
32	(Mehra et al, 2019)	1	1	1	1	1	1	0	1 7

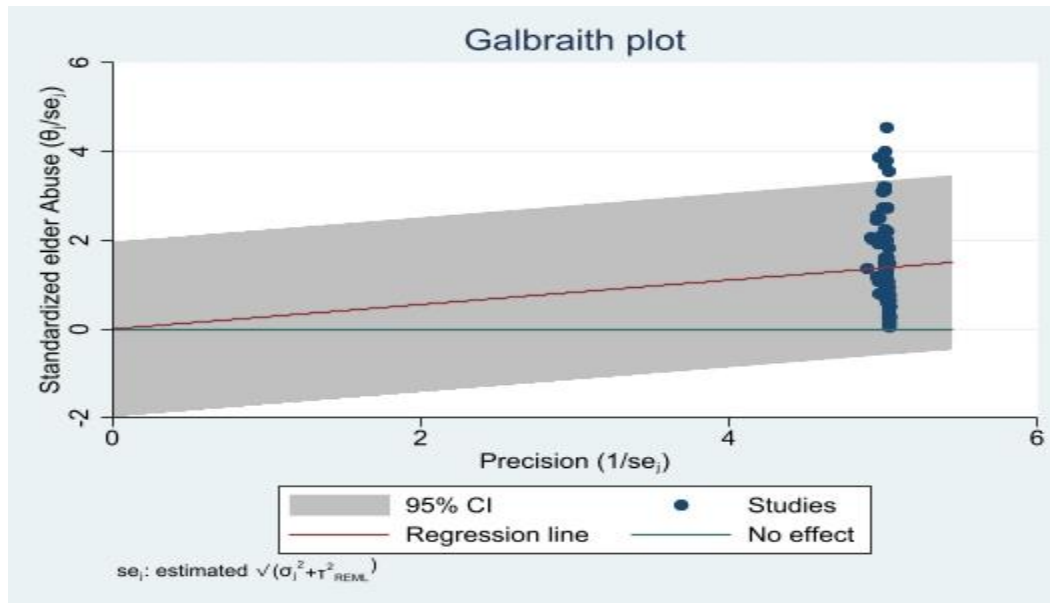
33	(Chandanshive et al, 2022	1	1	1	1	1	1	1	8
34	(Ramalingam et al., 2019)	1	1	0	0	1	1	0	5
35	(Alizadeh-Khoei et al., 2014)	1	1	1	1	1	1	1	8
36	(Mohseni et al., 2019)	1	1	1	1	1	1	1	8
37	(Nemati-Vakilabad et al., 2023)	1	1	1	1	1	1	1	8
38	(Salarvand et al., 2024)	1	1	1	1	1	0	1	7
39	(Piri et al., 2018)	1	1	1	1	1	1	1	8
40	(Kaveh et al., 2024)	1	1	1	1	1	1	0	7
41	(Keyghobadi et al., 2014)	1	1	1	1	1	1	1	8
42	(Naughton et al., 2012)	1	1	1	1	1	1	1	8
43	(Lowenstein et al., 2009)	1	1	1	0	1	0	1	6
44	(Ogioni et al., 2007)	1	1	1	1	1	1	1	8
45	(Fraga et al, 2014—Italy)	1	1	1	1	1	1	1	8
46	(Fraga et al, 2014—Lithuania)	1	1	1	1	1	0	1	7
47	(De Donder et al., 2011-Lithuania)	1	1	1	1	1	1	1	8
48	(Peshevska et al., 2014)	1	1	1	1	1	1	1	8
49	(Sooryanarayana et al., 2017)	1	1	1	1	1	1	1	8
50	(Acharya et al., 2021)	1	1	1	1	0	1	1	7
51	(Giraldo-Rodríguez et al., 2015)	1	1	1	0	1	1	1	7
52	(Ricárdez et al., 2007)	1	1	1	1	1	1	1	8
53	(Giraldo-Rodríguez & Agudelo-Botero, 2024)	1	1	0	1	0	1	1	6
54	(Subedi et al., 2025)	1	1	1	1	1	1	1	8
55	(Cadmus & Owoaje, 2012)	1	1	1	0	1	1	1	7
56	(Okojie et al., 2022)	1	1	1	0	1	1	1	7
57	(Cadmus & Owoaje, 2012)	1	1	1	1	1	1	1	8
58	(Silva-Fhon et al., 2015)	1	1	1	0	1	1	1	7
59	(Filipska et al., 2019)	1	1	1	1	1	1	1	8
60	(Fraga et al, 2014—Portugal)	1	1	1	0	1	0	1	6
61	(Martins et al., 2014)	1	1	0	0	1	1	1	6
62	(Gil et al., 2015)	1	1	1	1	1	0	0	6
63	(De Donder et al., 2011-Portugal)	1	0	1	0	1	1	1	6
64	(Mattoo et al., 2015)	1	1	1	1	1	1	1	8
65	(Kim & Sung, 2001)	1	1	0	1	1	1	0	6
66	(Jeon et al., 2019)	1	1	1	1	1	1	1	8
67	(Lee et al., 2021)	1	1	1	1	1	1	0	7
68	(Marmolejo, 2008)	1	1	1	1	1	1	1	8
69	(Garre-Olmo et al., 2009)	0	1	1	0	1	1	1	6
70	(Pérez-Rojo et al., 2013)	1	1	0	1	1	1	1	7
71	(Fraga et al, 2014—Spain)	1	1	1	0	1	1	0	6
72	(Fraga et al, 2014—Sweden)	1	1	1	1	1	1	1	8
73	(Wiklund et al., 2022)	1	0	0	0	1	1	1	5
74	(Choksomngam et al, 2023)	1	1	1	1	1	1	0	7
75	(Chompunud et al., 2010)	1	1	1	1	1	1	1	8
76	(Pak, 2020)	1	1	1	1	1	1	1	8
77	(Kulakçı Altıntaş & Korkmaz Aslan, 2020)	0	1	1	1	1	1	0	6
78	(Cevirme et al., 2012)	1	1	1	1	1	1	1	8
79	(Cooper et al., 2008)	1	1	1	1	0	1	1	7
80	(Moon et al., 2006)	1	1	1	1	1	1	1	8

81	(Acierno et al., 2010)	1	0	1	1	1	1	1	1	7
82	(Amstadter et al., 2011)	1	0	1	1	1	1	1	1	7
83	(DeLiema et al., 2012)	1	1	1	1	1	1	1	1	8
84	(Burnes et al., 2015)	1	1	1	1	1	1	1	1	8
85	(Rosay & Mulford, 2017)	1	0	1	1	1	1	1	1	7
86	(Dong et al., 2014)	1	1	1	1	1	1	1	1	8
87	(Dixon et al., 2010)	1	1	1	0	1	1	1	1	7
88	(Bonomi et al., 2007)	1	0	1	1	1	1	1	1	7
89	(Mouton et al., 2004)	1	1	1	1	1	1	1	1	8

Cohort Study Critical Appraisal (JBI Tool)

No.	Authors' name	1. Were the two groups similar and recruited from the same population?	2. Were the exposures measured similarly to assign people to both exposed and	3. Was the exposure measured in a valid and reliable way?	4. Were confounding factors identified?	5. Were strategies to deal with confounding factors stated?	6. Were the groups/participants free of the outcome at the start of the study (or at the	7. Were the outcomes measured in a valid and reliable way?	8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?	9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	10. Were strategies to address incomplete follow up utilized?	11. Was appropriate statistical analysis used?	Total
		1	1	1	1	1	1	1	0	1	1	1	10
1	(Joyce, 2020)	1	1	1	1	1	1	1	1	1	1	1	11
2	David et al, 2022	1	0	1	1	1	1	0	1	1	1	1	9
3	(Gagnon et al., 2023)	1	1	1	0	1	1	1	0	1	1	1	9
4	(E-Shien et al, 2021	1	1	1	0	1	1	1	1	1	1	1	10
5	(Chang & Levy, 2021)	1	1	0	1	1	1	0	1	1	1	1	9
6	(Burnes et al., 2022)	0	1	1	0	1	1	1	1	1	1	1	9

Appendix 5 :Heterogeneity assessment though Galbraith Plot



Appendix 6 :Leave-one-out analysis

Omitted Study	Elder Abuse	95% Conf. Interval	p-value
(Cations et al., 2021)	0.278	0.238 - 0.319	0.000
(Joyce, 2020)	0.277	0.237 - 0.318	0.000
(De Donder et al., 2011-Austria)	0.276	0.235 - 0.317	0.000
(De Donder et al., 2011-Belgium)	0.275	0.235 - 0.316	0.000
(Santos et al., 2013)	0.271	0.231 - 0.311	0.000
(Blay et al., 2017)	0.277	0.236 - 0.317	0.000
(Santos et al., 2021)	0.278	0.238 - 0.319	0.000
(Vida et al., 2002)	0.277	0.236 - 0.318	0.000
(David et al., 2022)	0.278	0.237 - 0.318	0.000
(Gagnon et al., 2023)	0.278	0.238 - 0.319	0.000
(Chokkanathan & Mohanty, 2025)	0.277	0.236 - 0.318	0.000
(Wang et al., 2019)	0.270	0.231 - 0.310	0.000
(Du & Chen, 2021)	0.277	0.236 - 0.318	0.000
(Chen & Chan, 2022)	0.277	0.237 - 0.318	0.000
(Su et al., 2011)	0.276	0.235 - 0.316	0.000
(Wu et al., 2012)	0.275	0.234 - 0.315	0.000
(Zhang et al., 2023)	0.272	0.232 - 0.312	0.000
(Cheng et al., 2025)	0.278	0.238 - 0.319	0.000
(Li et al., 2025)	0.271	0.231 - 0.310	0.000
(Ajdukovic et al., 2009)	0.272	0.232 - 0.312	0.000
(Luzny & Jurickova, 2012)	0.276	0.235 - 0.317	0.000
(Luzny & Jurickova, 2012)	0.276	0.235 - 0.317	0.000
(Abdel Rahman & El Gaafary, 2012)	0.274	0.233 - 0.315	0.000
(Tasisa & Yigezu, 2022)	0.277	0.236 - 0.318	0.000
(Wolde et al., 2022)	0.274	0.234 - 0.315	0.000
(Fraga et al., 2014—Germany)	0.275	0.235 - 0.316	0.000
(De Donder et al., 2011-Finland)	0.276	0.235 - 0.317	0.000

(Thomas et al., 2021)	0.273	0.233 - 0.313	0.000
(Brijoux et al., 2021)	0.273	0.233 - 0.313	0.000
(Fraga et al., 2014—Greece)	0.277	0.236 - 0.318	0.000
(Stöckl & Penhale, 2015)	0.276	0.235 - 0.316	0.000
(Chokkanathan & Lee, 2005)	0.277	0.237 - 0.318	0.000
(Chokkanathan, 2015)	0.276	0.236 - 0.317	0.000
(Mehra et al., 2019)	0.274	0.234 - 0.315	0.000
(Chandanshive et al., 2022)	0.277	0.236 - 0.317	0.000
(Ramalingam et al., 2019)	0.273	0.233 - 0.314	0.000
(Alizadeh-Khoei et al., 2014)	0.277	0.236 - 0.318	0.000
(Mohseni et al., 2019)	0.273	0.233 - 0.314	0.000
(Nemati-Vakilabad et al., 2023)	0.271	0.231 - 0.310	0.000
(Salarvand et al., 2024)	0.274	0.233 - 0.314	0.000
(Piri et al., 2018)	0.269	0.230 - 0.307	0.000
(Kaveh et al., 2024)	0.274	0.234 - 0.315	0.000
(Keyghobadi et al., 2014)	0.273	0.233 - 0.314	0.000
(Naughton et al., 2012)	0.278	0.238 - 0.319	0.000
(Lowenstein et al., 2009)	0.277	0.236 - 0.317	0.000
(Ogioni et al., 2007)	0.278	0.237 - 0.318	0.000
(Fraga et al., 2014—Italy)	0.277	0.237 - 0.318	0.000
(Fraga et al., 2014—Lithuania)	0.276	0.235 - 0.317	0.000
(De Donder et al., 2011-Lithuania)	0.276	0.236 - 0.317	0.000
(Peshevska et al., 2014)	0.275	0.235 - 0.316	0.000
(Sooryanarayana et al., 2017)	0.278	0.238 - 0.319	0.000
(Acharya et al., 2021)	0.273	0.233 - 0.313	0.000
(Giraldo-Rodríguez et al., 2015)	0.275	0.235 - 0.316	0.000
(Ricárdez et al., 2007)	0.278	0.237 - 0.318	0.000
(Giraldo-Rodríguez & Agudelo-Botero, 2015)	0.275	0.235 - 0.316	0.000
(Subedi et al., 2025)	0.272	0.232 - 0.312	0.000
(Cadmus & Owoaje, 2012)	0.275	0.235 - 0.316	0.000
(Okojie et al., 2022)	0.277	0.237 - 0.318	0.000
(Cadmus & Owoaje, 2012)	0.275	0.235 - 0.316	0.000
(Silva-Fhon et al., 2015)	0.270	0.231 - 0.309	0.000
(Filipska et al., 2019)	0.275	0.234 - 0.315	0.000
(Fraga et al., 2014—Portugal)	0.276	0.235 - 0.316	0.000
(Martins et al., 2014)	0.276	0.235 - 0.317	0.000
(Gil et al., 2015)	0.277	0.237 - 0.318	0.000
(De Donder et al., 2011-Portugal)	0.274	0.234 - 0.315	0.000
(Mattoo et al., 2015)	0.274	0.234 - 0.315	0.000
(Kim & Sung, 2001)	0.276	0.236 - 0.317	0.000
(Jeon et al., 2019)	0.278	0.237 - 0.318	0.000
(Lee et al., 2021)	0.277	0.237 - 0.318	0.000
(Marmolejo, 2008)	0.279	0.238 - 0.319	0.000
(Garre-Olmo et al., 2009)	0.276	0.235 - 0.316	0.000
(Pérez-Rojo et al., 2013)	0.277	0.237 - 0.318	0.000
(Fraga et al., 2014—Spain)	0.277	0.237 - 0.318	0.000
(Fraga et al., 2014—Sweden)	0.275	0.235 - 0.316	0.000
(Wiklund et al., 2022)	0.274	0.234 - 0.315	0.000
(Choksomngam et al., 2023)	0.277	0.236 - 0.318	0.000
(Chompunud et al., 2010)	0.277	0.236 - 0.318	0.000
(Pak, 2020)	0.276	0.236 - 0.317	0.000
(Kulakçı Altıntaş & Korkmaz Aslan, 2015)	0.277	0.237 - 0.318	0.000
(Cevirme et al., 2012)	0.276	0.235 - 0.316	0.000

(Cooper et al., 2008)	0.276	0.235 - 0.316	0.000
(Moon et al., 2006)	0.278	0.238 - 0.319	0.000
(Acierno et al., 2010)	0.278	0.237 - 0.318	0.000
(Amstadter et al., 2011)	0.277	0.237 - 0.318	0.000
(DeLiema et al., 2012)	0.274	0.234 - 0.315	0.000
(Burnes et al., 2015)	0.278	0.238 - 0.319	0.000
(Rosay & Mulford, 2017)	0.277	0.237 - 0.318	0.000
(E-Shien et al., 2021)	0.276	0.236 - 0.317	0.000
(Chang & Levy, 2021)	0.276	0.236 - 0.317	0.000
(Burnes et al., 2022)	0.278	0.237 - 0.318	0.000
(Dong et al., 2014)	0.277	0.236 - 0.318	0.000
(Dixon et al., 2010)	0.278	0.238 - 0.319	0.000
(Bonomi et al., 2007)	0.276	0.235 - 0.317	0.000
(Mouton et al., 2004)	0.278	0.237 - 0.318	0.000
Theta	0.276	0.235 - 0.316	0.000



Appendix 7: PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	3
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	3-4
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	5
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	5
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	5
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	5
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	5
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	5
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	5
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	5
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	6
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	6
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	6
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	6
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	6
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	6
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	6
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	6



PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	6
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	7
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	7
Study characteristics	17	Cite each included study and present its characteristics.	7
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	8
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	8
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	8
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	8
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	8-9
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	9
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	N/A
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	10
	23b	Discuss any limitations of the evidence included in the review.	11
	23c	Discuss any limitations of the review processes used.	12
	23d	Discuss implications of the results for practice, policy, and future research.	10,11,12
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	5
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Not prepared
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	13
Competing interests	26	Declare any competing interests of review authors.	13
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Supplementary file

Appendix 8: Checklist of information that should be included in new reports of global health estimates

Item #	Checklist item	Reported on page #
Objectives and funding		
1	Define the indicator(s), populations (including age, sex, and geographic entities), and time period(s) for which estimates were made.	5,6
2	List the funding sources for the work.	13
Data Inputs		
<i>For all data inputs from multiple sources that are synthesized as part of the study:</i>		
3	Describe how the data were identified and how the data were accessed.	5,6
4	Specify the inclusion and exclusion criteria. Identify all ad-hoc exclusions.	5
5	Provide information on all included data sources and their main characteristics. For each data source used, report reference information or contact name/institution, population represented, data collection method, year(s) of data collection, sex and age range, diagnostic criteria or measurement method, and sample size, as relevant.	5,6
6	Identify and describe any categories of input data that have potentially important biases (e.g., based on characteristics listed in item 5).	6
<i>For data inputs that contribute to the analysis but were not synthesized as part of the study:</i>		
7	Describe and give sources for any other data inputs.	N/A
<i>For all data inputs:</i>		
8	Provide all data inputs in a file format from which data can be efficiently extracted (e.g., a spreadsheet rather than a PDF), including all relevant meta-data listed in item 5. For any data inputs that cannot be shared because of ethical or legal reasons, such as third-party ownership, provide a contact name or the name of the institution that retains the right to the data.	7
Data analysis		
9	Provide a conceptual overview of the data analysis method. A diagram may be helpful.	7
10	Provide a detailed description of all steps of the analysis, including mathematical formulae. This description should cover, as relevant, data cleaning, data pre-processing, data adjustments and weighting of data sources, and mathematical or statistical model(s).	7
11	Describe how candidate models were evaluated and how the final model(s) were selected.	7
12	Provide the results of an evaluation of model performance, if done, as well as the results of any relevant sensitivity analysis.	7
13	Describe methods for calculating uncertainty of the estimates. State which sources of uncertainty were, and were not, accounted for in the uncertainty analysis.	7
14	State how analytic or statistical source code used to generate estimates can be accessed.	7
Results and Discussion		
15	Provide published estimates in a file format from which data can be efficiently extracted.	7,8
16	Report a quantitative measure of the uncertainty of the estimates (e.g. uncertainty intervals).	9,10 and table 2,3
17	Interpret results in light of existing evidence. If updating a previous set of estimates, describe the reasons for changes in estimates.	10,11,12
18	Discuss limitations of the estimates. Include a discussion of any modelling assumptions or data limitations that affect interpretation of the estimates.	12

This checklist should be used in conjunction with the GATHER statement and Explanation and Elaboration document, found on gather-statement.org