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PMC is a full text archive that includes articles from journals reviewed and selected by NLM for archiving (current and historical), as well as individual articles collected for archiving in compliance with funder policies. The final component of PubMed is citations for books and some individual chapters available on Bookshelf. Bookshelf is a full text archive of books, reports, databases, and other documents related to biomedical, health, and life sciences. Please see PubMed Coverage for more information about the types of content included in PubMed. For how-to information on searching the PubMed database, see the PubMed User Guide. Last update:March 11, 2025 Clipboard, Search History, and several other advanced features are temporarily unavailable. The .gov means its official. Federal government websites often end in .gov or .mil. Before sharing sensitive information, make sure youre on a federal government site. The site is secure. The https:// ensures that you are connecting to the official website and that any information you provide is encrypted and transmitted securely. Your history is currently empty! As you use PubMed your recent searches will appear here. Your entire search history is about to be cleared. The search history record is about to be deleted. No History items are available for download. History items expire after 8 hour of inactivity. Click 'Refresh' to clear items from the table, or click the 'X' to go back to the table. The history table currently contains expired items. Clear expired items and add your new query? No History items are available for deletion. History items expire after 8 hour of inactivity. Click 'Refresh' to clear items from the table, or click the 'X' to go back to the table. Each year, the American Cancer Society estimates the numbers of new cancer cases and deaths in the United States and compiles the most recent data on population-based cancer occurrence and outcomes using incidence data collected by central cancer registries (through 2021) and mortality data collected by the National Center for Health Statistics (through 2022). In 2025, 2,041,910 new cancer cases and 618,120 cancer deaths are projected to occur in the United States. The cancer mortality rate continued to decline through 2022, averting nearly 4.5 million deaths since 1991 because of smoking reductions, earlier detection for some cancers, and improved treatment. Yet alarming disparities persist; Native American people bear the highest cancer mortality, including rates that are two to three times those in White people for kidney, liver, stomach, and cervical cancers. Similarly, Black people have two-fold higher mortality than White people for prostate, stomach, and uterine corpus cancers. Overall cancer incidence has generally declined in men but has risen in women, narrowing the male-to-female rate ratio (RR) from a peak of 1.6 (95% confidence interval, 1.57-1.61) in 1992 to 1.1 (95% confidence interval, 1.12-1.12) in 2021. However, rates in women aged 50-64 years have already surpassed those in men (832.5 vs. 830.6 per 100,000), and younger women (younger than 50 years) have an 82% higher incidence rate than their male counterparts (141.1 vs. 77.4 per 100,000), up from 51% in 2002. Notably, lung cancer incidence in women surpassed that in men among people younger than 65 years in 2021 (15.7 vs. 15.4 per 100,000; RR, 0.98, p = 0.03). In summary, cancer mortality continues to decline, but future gains are threatened by rampant racial inequalities and a growing burden of disease in middle-aged and young adults, especially women. Continued progress will require investment in cancer prevention and access to equitable treatment, especially for Native American and Black individuals. Keywords: cancer cases; cancer statistics; death rates; incidence; mortality. The .gov means its official. Federal government websites often end in .gov or .mil. Before sharing sensitive information, make sure youre on a federal government site. The site is secure. The https:// ensures that you are connecting to the official website and that any information you provide is encrypted and transmitted securely. Last update: June 25, 2025 Follow PubMed New and Noteworthy for brief announcements highlighting recent enhancements and changes to PubMed. FAQs Search PubMed Identify the key concepts for your search. Enter the terms (or key concepts) in the search box. Press the Enter key or click Search. For many searches, it is not necessary to use special tags or syntax. PubMed uses multiple tools to help you find relevant results: Best Match sort order uses a state-of-the-art machine learning algorithm to place the most relevant citations at the top of your results. An autocomplete feature displays suggestions as you type your search terms. This feature is based on PubMed query log analysis described in " Finding Query Suggestions for PubMed ." A spell checking feature suggests alternative spellings for search terms that may include misspellings. A citation sensor displays suggested results for searches that include terms characteristic of citation searching, e.g., author names, journal titles, publication dates, and article titles. To limit the number of search results: Replace general search terms with more specific ones (e.g., low back pain instead of back pain). Include additional terms in your query. Use the sidebar filters to restrict results by publication date, full text availability, article type, and more. On the abstract page for a citation, see the Similar Articles section for a pre-calculated set of additional PubMed citations closely related to that article. Remove extraneous or specific terms from the search box. Try using alternative terms to describe the concepts you are searching. Paste the article title into the search box, or enter citation details such as the author, journal name and the year the article was published in the search box and the PubMed citation sensor will automatically analyze your query for citation information to return the correct citation. The citation sensor incorporates a fuzzy matching algorithm and will retrieve the best match even if a search includes an incorrect term. You do not need to use field tags or Boolean operators. Enter the authors last name and initials without punctuation in the search box, and click Search. If you only know the authors last name, use the author search field tag [au], e.g., brody[au]. Names entered using either the lastname+initials format (e.g., smith ja) or the full name format (john a smith) and no search tag are searched as authors as well as collaborators, if they exist in PubMed. Enter a full author name in natural or inverted order, e.g., julia s wong or wong julia s. Prior to 2002, full author names were not included on PubMed citations, so full author name searches will only retrieve citations from 2002 forward, when the full author name was published in the article. A comma following the last name for searching is optional. For some names, however, it is necessary to distinguish which name is the last name by using the comma following the last name, e.g., james, ryan. Omit periods after initials and put all suffixes at the end, e.g., vollmer charles jr Initials and suffixes are not required. If you include a middle initial or suffix, you will only retrieve citations for articles that were published using the middle initial or suffix. More information about author searching: To search by author using the search builder, click Advanced searchand then select Author from the All Fields menu. The author search box includes an autocomplete feature. You may click an author link on the abstract display to execute a search for the author in PubMed. Results will display using a ranking algorithm if the author name is computationally similar for additional PubMed citations. If an author name includes only stopwords, use the author search field tag [au] to search in combination with other terms, e.g., just by[au] seizure. Author names are automatically truncated to account for varying initials and designations such as Jr. To turn off the truncation, use double quotes around the author's name with the author search field tag [au], e.g., "smith j"[au]. Use the search field tag [1au] to search for the first personal author or [lastau] to search for the last personal author name in a citation. For additional information on author names in PubMed, please see the journal article, "Author Name Disambiguation for PubMed." Enter one of the following in the search box: full journal title (e.g., molecular biology of the cell) title abbreviation (e.g., mol biol cell) ISSN number, a standardized international code (e.g., 1059-1524) More information about journal searching: To search by journal using the search builder,click Advanced searchand then select Journal from the All Fields menu. The journal search box includes an autocomplete feature. To find full journal names, use the NLM Catalog, or mouseover the journal title abbreviation on the citation (available in abstract view). Click Journals in NCBI Databases on the PubMed homepage. Enter the journal name and click Search. Use the journal search field tag [ta]to limit your search to the journal only, e.g., gene therapy[ta], scanning[ta] Searching with the full journal title or abbreviation is recommended for complete retrieval of indexed items; older citations may not have an ISSN. If a journal title or abbreviation includes a special character (e.g., parentheses, brackets, &), enter the title or abbreviation without the special characters. For example, to search by the journal abbreviation j hand surg [am], enter j hand surg am. Searching for a journal will automatically map to the official journal title and the title associated with an alternative title, if one exists. To turn off this automatic mapping enter the journal in double quotes and tag with [ta], e.g., "science"[ta]. A list of journals included in PubMed is available by FTP. Click and drag the sliders on the Publication Date timeline to change the date range for your search. Note: The Publication Date timeline counts all publication dates for a citation as supplied by the publisher, e.g., print and electronic publication dates. These dates may span more than one year; for example, an article that was published online in November 2018 and published in a print issue in January 2019. This means the sum of results represented in the timeline may differ from the search results count. Click Advanced searchand use the search builder. Select a date field from the All Fields menu, e.g., Date Publication, and enter a single date or a date range in the fill-in-the-blank boxes. Month and day are optional. If you want to search for a date range up to the current date, do not edit the Present date box. Add the date from the builder to the query box. Once you have finished adding terms to the query box, click Search (or Add to History) to run the search. Enter dates using the format yyyy/mm/dd [date field]. The month and day are optional. Use a Boolean operator when combining a date with other search terms. The available date fields are: Date of Publication [dp] - Date searching includes both print and electronic dates of publication. Searching for a single date does not include items when the electronic date of publication is after the print date. Electronic Date of Publication (if applicable) [epdat] Print Date of Publication (if applicable) [ppdat] Entry Date [edat] - Date used for PubMed processing, such as Most Recent sort order. MeSH Date [mhda] - The date the citation was indexed with MeSH terms. Create Date [crdt] - The date the PubMed record was first created. Enter date ranges using a colon (:) between each date followed by a [date field]. Use a Boolean operator when combining a date range with other search terms. Comprehensive searches for a full year should be entered as 2000:2000[dp] rather than 2000[dp] to retrieve citations with a different print and electronic year of publication. Date range searching includes both print and electronic dates of publication. Use the following format to search for a relative date range: term="last X days"[date field] term="last X months"[date field] term="last X years"[date field] where X is the number of days, months or years immediately preceding todays date and [date field] is the date field tag: [dp], [edat] or [crdt]. The relative date range search for publication dates will also include citations with publication dates after today's date; therefore, citations with publication dates in the future will be included in the results. You can use filters to narrow your search results by publication date, text availability, article attribute, article type, article language, species, sex, age, and other. To apply a filter: Run a search in PubMed. Click the filter you would like to activate from the sidebar. A check mark will appear next to the activated filter(s). Subsequent searches will be filtered until the selected filters are turned off, or until your browser data is cleared. A green "Filters applied" message will display at the top of the results page when filters are applied to your search. The most frequently used filters appear on the sidebar by default. More filters are available for some categories: Click the "See all filters" link for a filter category. A pop-up menu will appear showing all available filters for that category. Select the filter(s) you would like to apply to your search. To cancel your selections, click Cancel or click on the X in the upper right corner to close the pop-up and return to your search results. Click Apply. This will close the pop-up menu, apply the selected filter(s) to your search, and display your selection(s) on the sidebar. The selected filter(s) will appear on the sidebar in addition to the default filters until your browser cookies are cleared, or you click the "Reset filters display" button at the bottom of the sidebar. Clearing applied filters: To turn off all currently applied filters, click the "Clear filters" link in the green "Filters applied" message at the top of the page, or click the "Clear all filters" button at the bottom of the sidebar. To turn off individual filters, click the filter on the sidebar. To reset the filters shown on the sidebar to the default filter list, click the "Reset filters display" button at the bottom of the sidebar. This will also clear any currently applied filters. More information about filters: Many filters under the Additional Filters section limit your search results to citations that have been assigned specific MeSH terms during MEDLINE indexing. This means these filters may exclude some otherwise relevant results that do not include the associated MeSH terms. See Filter search strategies for the equivalent PubMed query for each filter. You can activate additional filters with My Custom filters. Once activated, these filters will appear at the top of your sidebar under "My Custom Filters". To filter your results by Publication Date, click 1 year, 5 years, 10 years, or enter a custom range. The 1 year, 5 years, and 10 years filters search for a relative date range based on today's date. Publication Date filters include both electronic and print publication dates. Text availability filters To filter your results to only citations that include a link to full text, a link to free full text, or an abstract, click the appropriate selections. Alternatively, you may search for citations with links to full text, free full text or include an abstract using the values: full text[sb], free full text[sb], or 'hasabstract'. No search field tag is required for hasabstract. You may also search for all citations with a structured abstract with hasstructuredabstract. Note: Most citations in PubMed to articles published before 1975 do not include abstracts. Article attribute filter Use the associated data filter to find citations that include secondary source databanks and accession numbers. These data links connect to records in other NLM databases (for example: GenBank, ClinicalTrials.gov) or external data repositories (for example: figshare, Dryad). Data links are provided by the publisher and/or by data repositories through participation in NCBIs LinkOut service. Article type filters Use article type filters to narrow your results based on the content or style of the article, such as: Clinical Trial or Review. Article types are also called publication types. You can add more article type filters to the sidebar using the "See all article type filters" link. The complete list of publication types found in PubMed is available. Article type filters rely on citations' Publication Type [pt] data except for the Systematic Review filter, which uses a search strategy in addition to the publication type. Publication type data may be supplied by the publisher or assigned during the MEDLINE indexing process. Therefore, these filters may exclude some citations that have not yet completed the MEDLINE indexing process. To search for systematic reviews in PubMed, use the Systematic Review article type filter on the sidebar, or enter your search terms followed by AND systematic[sb] in the search box. For example, lyme disease AND systematic[sb]. The Systematic Review filter uses a search strategy in addition to the Systematic Review publication type [pt] to find systematic reviews in PubMed. To limit your search to only those citations with the Systematic Review publication type, use the publication type search tag[pt], i.e., systematic review[pt]; however, this may exclude some relevant citations that have not yet completed the MEDLINE indexing process. Language filters restrict your search to articles published in the selected language(s). You can add more language filters to the sidebar using the "See all article language filters" link. By default, PubMed displays English language titles and abstracts when provided by the publisher. Check the Abstract display for links to view the abstract in other languages (when available). Article language filters are located under the Additional Filters section. Species filters restrict your results to human or animal studies: Species filters limit your search results to citations that were assigned the associated MeSH terms for species during MEDLINE indexing. These filters will typically deliver precise results but can also exclude some otherwise relevant results that do not include the associated MeSH terms on their PubMed record. For example, some citations are not indexed for MEDLINE, such as preprints, Online Ahead of Print citations, and U.S. government-funded research published in journals that are not indexed for MEDLINE. Species filters are located under the Additional Filters section. Sex filters restrict your search results to a specific sex for an animal or human study: Sex filters limit your search results to citations that were assigned the associated MeSH terms for sex during MEDLINE indexing. These filters will typically deliver precise results but can also exclude some otherwise relevant results that do not include the associated MeSH terms on their PubMed record. For example, some citations are not indexed for MEDLINE, such as preprints, Online Ahead of Print citations, and U.S. government-funded research published in journals that are not indexed for MEDLINE. Sex filters are located under the Additional Filters section. Age filters restrict results to a specific age group for a human study. Age filters limit your search results to citations that were assigned the associated MeSH terms for age during MEDLINE indexing. These filters will typically deliver precise results but can also exclude some otherwise relevant results that do not include the associated MeSH terms on their PubMed record. For example, some citations are not indexed for MEDLINE, such as preprints, Online Ahead of Print citations, and U.S. government-funded research published in journals that are not indexed for MEDLINE. Age filters are located under the Additional Filters section. You can add more age filters to the sidebar using the "See all age filters" link. Age filters include: Child: birth-18 years Newborn: birth-1 month Infant: birth-23 months Infant: 1-23 months Preschool Child: 2-5 years Child: 6-12 years Adolescent: 13-18 years Adult: 19+ years Young Adult: 19-24 years Adult: 19-44 years Middle Aged + Aged: 45+ years Middle Aged: 45-64 years Aged: 65+ years 80 and over: 80+ years Exclude preprints The Exclude preprints filter will exclude preprint citations from your search results. Alternatively, you can exclude preprints from your search results by including NOT preprint[pt] at the end of your query. See Preprints for more information about preprint citations in PubMed. The Exclude preprints filter is located under the Additional Filters section. MEDLINE Subset The MEDLINE filter limits results to citations that are indexed for MEDLINE. To use this filter in a query, add medline[sb] to your search. The MEDLINE filter is located under the Additional Filters section. PubMed Central Subset To restrict retrieval to citations that have a free full text article available in PubMed Central (PMC), search "pubmed pmc"[sb]. Use the PMID/PMCID/NIHMSID Converter to convert IDs for publications referenced in PubMed and PMC. To retrieve citations that include an NIHMS ID use the query, hasnihmsid. Citation Status Subsets The citation status indicates the internal processing stage of an article in the PubMed database (see PubMed Citation Status Subsets). To search for a particular citation status, enter one of the search terms below followed by the [sb] search tag: publisher inprocess medline pubmednotmedline To search for the total number of PubMed citations, enter all[sb] in the search box. Ahead of Print Citations Publishers may submit citations for articles that appear on the web prior to their publication in final or print format. To search for these ahead-of-print citations, enter pubstatusaheadofprint. Many phrases are recognized by the subject translation table used in PubMed's Automatic Term Mapping (ATM). For example, if you enter fever of unknown origin, PubMed recognizes this phrase as a MeSH Term. You can bypass ATM and search for a specific phrase using the following formats: Enclose the phrase in double quotes: "kidney allograft" If you use quotes and the phrase is not found in the phrase index, the quotes are ignored and the terms are processed using automatic term mapping. The message "Quoted phrase not found in phrase index" will display at the top of your search results. Use a search tag: kidney allograft[tw] If you use a search tag and the phrase is not found in the phrase index,the phrase will be broken into separate terms. For example, "psittacine flight" is not in the phrase index, so a search for psittacine flight[tw] is broken up and translated as: ((("psittaciformes"[MeSH Terms] OR "psittaciformes"[All Fields]) OR "psittacine"[All Fields]) OR "psittacines"[All Fields]) AND "flight"[Text Word] Use a hyphen: kidney-allograft If you use a hyphen and the phrase is not found in the phrase index, the search will not return any results for that phrase. Hyphenated phrases matching a MeSH term or entry term will include those terms in the search translation. If you want to prevent such mapping, put the hyphenated phrase inside double quotes: "heart-attack" When you enter search terms as a phrase, PubMed will not perform automatic term mapping that includes the MeSH term and any specific terms indented under that term in the MeSH hierarchy. For example, "health planning" will include citations that are indexed to the MeSH term, Health Planning, but will not include the more specific terms, e.g., Health Care Rationing, Health Care Reform, Health Plan Implementation, that are included in the automatic MeSH mapping. PubMed uses a phrase index to provide phrase searching. To browse the phrase index, use the Show Index feature included in the Advanced Search builder: select a search field, enter the beginning of a phrase, and then click Show Index. Phrases may appear in a PubMed record but not be in the phrase index. To search for a phrase that is not found in the phrase index, use a proximity search with a distance of 0 (e.g., "cognitive impairment in multiple sclerosis"[tiab:~0]); this will search for the quoted terms appearing next to each other, in any order. Automated processes regularly add new phrases to the index based on standard criteria such as phrase frequency and length. If you would like to request a phrase be added to the phrase index, please write to the NLM Help Desk. To create a wildcard search in PubMed, use an asterisk (*) to substitute for 0 or more characters in a term or phrase. For example, "vaccin* schedul*" will find results that include "vaccine schedule", "vaccine scheduling", "vaccination schedules", and more variations of this phrase. A wildcard (*) substitutes for 0 or more characters Terms must begin with at least 4 characters before the first wildcard: colo* Multiple wildcards can be used in the same term: organi*ation* To use wildcards in a phrase search, use any of the following formats: Enclose the phrase in double quotes: "breast feed*" Use a search tag:breast feed* [tiab] Use a hyphen:breast-feed* Phrases can include more than one wildcard: "colo* cancer*" Wildcards turn off Automatic Term Mapping (ATM) and the process that includes the MeSH term and any specific terms indented under that term in the MeSH hierarchy. For example, "heart attack*" will not map to the MeSH term Myocardial Infarction or include any of the more specific terms, e.g., Myocardial Stunning; Shock, Cardiogenic. Wildcards can be particularly useful to capture variations of a phrase, since phrase searches already turn off automatic term mapping and do not otherwise include alternate spellings or singular/plural forms. For example, searching for "tumo*r associated macrophage*" retrieves variations of the phrase such as: "tumor associated macrophage", "tumour associated macrophage", "tumor associated macrophages", and "tumour associated macrophages". PubMed applies an AND operator between concepts, e.g., "vitamin c common cold" is translated as vitamin c AND common cold. Enter Boolean operators in uppercase characters to combine or exclude search terms: AND retrieves results that include all the search terms. OR retrieves results that include at least one of the search terms. NOT excludes the retrieval of terms from your search. PubMed processes searches in a left-to-right sequence. Use parentheses to "nest" concepts that should be processed as a unit and then incorporated into the overall search. PubMed uses automatic term mapping to identify concepts. For example, for the search air bladder fistula, PubMed will search "air bladder" as a phrase. If you do not want this automatic phrase parsing, enter each term separated by the Boolean operator AND, e.g., air AND bladder AND fistula. Search Details show how a search was translated. You can search for a term in a specific field by including a search field tag after the term; for example, UCLA[ad] will search for the term UCLA in the affiliation field only. More information about using search field tags: The search field tag must be enclosed in square brackets. Case and spacing do not matter: crabs [mh] = Crabs[mh]. Search field tags turn off Automatic Term Mapping (ATM), limiting your search to the specified term only. Using a search field tag after multiple terms will attempt to search those terms as a phrase: kidney allograft[tiab]. To search multiple terms in the same field, each term must be tagged individually: covid-19[ti] vaccine[ti] children[ti]. The Advanced Search builder can help you search for terms in specific fields and build large, complex search strings. You can use proximity searching to search for multiple terms appearing in any order within a specified distance of one another in the [Title], [Title/Abstract], or [Affiliation] fields. To create a proximity search in PubMed, enter your terms using the following format: "search terms"[field:~N] Search terms = Two or more words enclosed in double quotes. There is no limit to the number of words you can search together in proximity; however, the more terms you enter, the more restrictive your search becomes. Using the Boolean operator AND to combine terms may be more appropriate than combining many terms into one proximity search. Field = The search field tag for [Title], [Title/Abstract], or [Affiliation] fields. Proximity searching is only available in the Title, Title/Abstract, and Affiliation search fields. You can use the full search field tags [Title], [Title/Abstract], and [Affiliation], or the abbreviated versions [ti], [tiab], and [ad]. N = The maximum number of words appearing between your search terms. What N value to use will depend on your search. Try changing the N value and comparing the results to find what works best for your search. A higher N creates a broader, more comprehensive search; this will typically retrieve more results overall, but some of these results may be less relevant. Using the Boolean operator AND to combine terms may be more appropriate than proximity searching with a large N value. A lower N creates a narrower, more precise search; this will typically retrieve fewer results that are highly relevant, but may exclude other relevant results. If N=0, the quoted terms will appear next to each other--with no other words in between. For the affiliation field only, an N value of 1,000 or less will search for the double quoted terms together within the same affiliation, rather than spread across all affiliations on the record. See Affiliation [ad] for an example proximity search in the affiliation field and more information about searching for affiliations. More information about proximity searching: Results will include your quoted terms in any order. If you would like to search for an exact phrase with terms appearing in a specific order, use a phrase search instead. Automatic Term Mapping is not applied to the quoted terms. Proximity searching is not compatible with wildcards (*). If the double quoted terms in a proximity search include a wildcard (*), the proximity operator will be ignored. You can combine proximity searches with other terms using Boolean operators; for example, "hip pain"[Title:~4] AND stretching Booleans and stopwords included in quoted terms for proximity search are searched like regular keywords. Example Search PubMed for citations with the terms "rationing" and "healthcare" appearing within 2 words of each other--in any order--in the Title field: "rationing healthcare"[Title:~2] Search results may include: rationing healthcare, healthcare rationing, rationing of healthcare, rationing in healthcare, rationing universal healthcare, rationing strategies in healthcare, rationing limited healthcare and more. Example Search PubMed for citations with the terms "patient," "physician," and "relationship" appearing next to each otherin any orderin the Title/Abstract fields: "patient physician relationship"[Title/Abstract:~0] Since N=0, the quoted terms must appear next to each other with no other words in between them, although they can still appear in any order. Citations are initially displayed 10 items per page and sorted by Best Match. By default, PubMed search results are displayed in a summary format and includesnippets from the citation abstract. Snippets and highlighted terms are selected based on relatedness to your query. To see the abstract for an individual citation, click the title of the citation to go to its abstract page. Journal names are shown using the journal title abbreviation. When viewing citations in Abstract format, you can mouseover a journals title abbreviation to display the full journal name. Click the title of the citation to go to its abstract page, or change the search results display to Abstract format using the Display options button in the upper right corner of the search results page. PubMed may include non-English abstracts if supplied by the publisher. The abstract text defaults to English when a citation has an accompanying non-English abstract. Links to display the additional language(s) are available on the Abstract display. To retrieve citations with non-English abstracts, use the query hasnonenglishabstract. Results are displayed in the summary format by default, except a single citation result will go directly to the abstract page. You can change the results format using the Display options button: Click the Display options button in the upper right corner of the search results page Select the display format you would like to use Results will be displayed in the new format Selecting one or more items and changing the display format will display only the selected result(s) in the new format. By default, the summary format includessnippets from the citation abstract. You can turn off snippets under Display options by deselecting Abstract snippets. The results page indicates the total number of items retrieved. Ten items are displayed per page by default. You can change the number of items displayed per page using the Display options button: Click the Display options button in the upper right corner of the search results page Select the number of items to display per page: 10, 20, 50, 100, or 200 Your selection will be active for subsequent searches until your browser cookies are cleared. Click "Show more" to display the next page of results, or click "Jump to page" to navigate directly to a specific page of results. The default sort order in PubMed is Best Match. You can use the "Sort by" drop-down menu at the top of the search results page to change the sort order. If you change the sort order, your new selection will be active for subsequent searches until your browser cookies are cleared. You can sort your search results by: Best Match: The Best Match sort order is based on an algorithm that analyzes each PubMed citation found with your search terms. For each search query, "weight" is calculated for citations depending on how many search terms are found and in which fields they are found. In addition, recently-published articles are given a somewhat higher weight for sorting. The top articles returned by the weighted term frequency algorithm above are then re-ranked for better relevance by a new machine-learning algorithm. Please see the Algorithm for finding best matching citations in PubMed for more information. Most Recent: Citations sorted by Most Recent are displayed in reverse date added order: last in, first out. The Most Recent date is the date a record was initially added to PubMed, not the publication date. The secondary sort is PMID. Publication Date: Citations sorted by Publication Date are displayed in reverse chronological order: newest to oldest. Citations with more than one publication date, such as electronic and print, are sorted by their earliest publication date. Publication dates without a month are set to January, multiple months (e.g., Oct-Dec) are set to the first month, and dates without a day are set to the first day of the month. Dates with a season are set as: winter = January, spring = April, summer = July and fall = October. First Author: Citations are sorted alphabetically by first author name. The secondary sort order within a group with the same first author is PMID. Journal: Citations are sorted alphabetically by journal name. The secondary sort order within a group with the same journal name is PMID. Reverse sort order When sorting by Most Recent, Publication Date, First Author, or Journal, you can reverse the sort order by clicking the up/down arrow next to the selected sort option to toggle between ascending or descending order. The reverse sort option will not display when Best Match sort order is selected. Clicking an author name link on the abstract display runs a search for the author in PubMed. If an author name is computationally similar with an author name for additional PubMed citations, the results will display those citations first, in ranked order, followed by the non-similar citations. Author name disambiguation details are available in Liu W and Wilbur WJ. Finding the full text article PubMed records contain citation information (e.g., title, authors, journal, publication date) and abstracts of published articles and books. PubMed search results do not include the full text of the journal article, but the abstract view in PubMed includes links to the full text from other sources when available, such as the publishers website or the PubMed Central (PMC) database. The full text journal site may require a fee or subscription, however online journals sometimes provide free access. Access may also be available through your organization, or local medical library. You may be able to obtain free copies of full text articles in these ways: Free full text filter On the filter sidebar, click "Free full text" to narrow results to resources that are available for free on the web, including PubMed Central, Bookshelf, and publishers' websites. Alternately, include free full text[Filter] in your query. PubMed Central When full text is available in PubMed Central (PMC), the "Free in PMC" icon will appear on the citation's abstract display under Full Text Links. Click the icon to view the article in PMC. 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PubMed displays grant numbers, contract numbers, and intramural research identifiers that have been associated with a publication by: A grant award or contract may be acknowledged in an article and, therefore, displayed in PubMed, for various reasons, including support for activities that contributed directly to the publication as well as support for the generation of an underlying dataset or another shared resource. Additionally, some articles may not explicitly acknowledge intramural research support, yet the authors may be affiliated with a funding agency and may have associated their intramural support with a PubMed record at the time of manuscript deposit to PMC. Funding information in PubMed is collected in or converted to a standardized format when possible to enable broad discovery and impact monitoring. 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Beginning in March 2006, funding information was expanded in PubMed to include grant, contract, and intramural funding assertions made in NIHMS and My Bibliography to support the NIH Public Access Policy. Publishers have been able to supply funding information directly to PubMed since January 2017. Some publications may be inadvertently linked to the wrong funding information. For example, the association of a publication to NIH-funded extramural research requires that the author(s) acknowledge NIH support in the article and that the acknowledgement be in a form that can be readily associated with a specific grant or contract. Variations in the format used to cite NIH funding may lead to either an inability to make an association or erroneous matches of publications to grants and contracts. If you identify an error in funding information associated with a PubMed record, please contact the NLM help desk. NLM will not remove funding associations that reflect the acknowledged funding in the article without a published correction to ensure alignment with the scientific record. If an award association was provided by the author, principal investigator, or project director in My Bibliography or the NIHMS for formal NIH progress and public access compliance reporting, removing the association requires the principal investigator be notified and confirm the lack of direct support. PubMed can display up to 10,000 results. The following options can help you navigate searches with more than 10,000 results: When available, links to other related NCBI databases are included on a citation's Abstract page under the Related information section. The complete list of database options is provided in Entrez Link Descriptions. MEDLINE indexed citations include additional supplemental information on the Abstract page such as MeSH terms, publication types, and substances with links to search for these data in PubMed and the MeSH Database. To simultaneously search all NCBI databases, use the NCBI Search page. Most PubMed records include LinkOut resources to a variety of websites including publishers, aggregators, libraries, biological databases, and sequence centers. LinkOut resources link to providers sites to obtain the full text of articles or related information, e.g., consumer health. There may be a charge to access the text or information from a provider's site. To view LinkOut resources, navigate to the LinkOut section at the end of an individual citation's abstract page. To find citations with links to free full text articles, apply the "Free full text" filter to your search results. To find citations with links to full text articles, enter search terms followed by AND full text[sb]. More information about Links: LinkOut resource categories such as "free full text" have been selected by the LinkOut provider. The current list of LinkOut providers is available. A publisher's icon link may display on the abstract format if they have electronically provided their citation data to NCBI. Links are only available for publishers that are participating in LinkOut; publishers are responsible for providing working links. LinkOut links are supplied by the LinkOut providers. Publishers who electronically supply their data to PubMed may include an icon that links to a site providing the full text. Corrections and changes to links are made by the providers and are their responsibility. To report problem links or inquire about online journal subscriptions, contact the provider directly. Contact information is typically available at a provider's web site. The Clipboard provides a place to collect up to 500 items from one or more searches. Items saved to the Clipboard are stored in your browser cookies and will expire after 8 hours of inactivity. If you would like to save items for longer than 8 hours or to view on another device, please use Send to: Collections. To add items to the Clipboard: Use the check boxes to select items from your search results. To save all results (up to a maximum of 500), do not tick any check boxes. Use the Send to button and choose Clipboard. Selected items will be added to the Clipboard. If no items were selected, a drop-down menu of options will display where you may add selected items, all results on the page, or all results (up to a maximum limit of 500 citations) to the Clipboard. An individual item can also be added to the Clipboard from its abstract page. To view your selections, click the Clipboard link under the Search bar. This link will only appear after one or more items have been added to the Clipboard; the link is not present when the Clipboard is empty. To delete items from the Clipboard: On the Clipboard page, click "Remove from Clipboard" below each item to delete the item from the Clipboard. Select one or more items using the check boxes next to each item, then click "Remove selected items." To delete all items from the Clipboard, click "Remove all." More information about the Clipboard: Citations added to the Clipboard are marked with the message "Item in Clipboard" in search results. The maximum number of items that can be sent to the Clipboard is 500. If you select Clipboard from send to without selecting citations, PubMed will add all (up to 500 citations) of your search results to the Clipboard. The Clipboard will not add a citation that is currently in the Clipboard; it will not create duplicate entries. Your web browser must accept cookies to use the Clipboard. Citations in the Clipboard are represented by the search number #0, which may be used in Boolean search statements. For example, to limit the citations you have collected in the Clipboard to English language articles, use the following search: #0 AND english [la]. This does not affect or replace the Clipboard contents. Search results can be saved in My NCBI using the Collections feature. There is no limit to the number of collections you may store in My NCBI. In addition, collections can be made public to share with others. To save results to a new collection: Sign into My NCBI. Run a search in PubMed. Use the check boxes to select items from your search results or Clipboard. To save all results (up to a maximum of 1,000), do not tick any check boxes. Use the Send to button and choose Collections. Selected items will be added to a Collection. If no items were selected, a drop-down menu of options will display where you may add selected items, all results on the page, or all results (up to a maximum limit of 1,000 citations) to a Collection. An individual item can also be added to a Collection from its abstract page. Choose Create a new collection. Name your collection using a short, meaningful title. The name must be unique and less than 100 characters. Identical names for different Collections are not allowed. Click Add to finish. As you continue to build collections, you may want to add new items to an existing collection. To add search results to an existing collection: Follow steps 1 - 4 above. Add to an existing collection will be the default selection. Use the pull-down menu to choose a collection. Click Add to finish. For more information on viewing, sorting, editing, merging, sharing, and deleting collections, see Collections in My NCBI Help. Use the Save button to download citations to a text file. Use the check boxes to select citations from your search results or Clipboard. You may move to other pages to continue your selections. If you do not make any selections, you can choose to save All results on this page or All results from the Save menu. Click Save and choose a Selection and Format from the menu that appears. Selection: The citations you would like to save. Selection: The number of selected items will be shown, for example: Selection (87). All results on this page All results (up to a maximum of 10,000 citations) Format: Summary (text), PubMed, PMID list, Abstract (text), or CSV Click Create file. Your web browser will prompt you to save the file on your computer. More information about saving citations to a file: Saving a large set of results may take several minutes. To save citations in HTML format, use the "Save" or "Save as" function of your browser and change the file extension to html. When saving as HTML, only those citations displayed on the page will be saved; therefore, consider showing more results. The Cite button makes it easy to retrieve styled citations that you can copy and paste into a document, or download an .nbib file to use with your reference manager software. Using the Cite button for an item will open a pop-up window where you can copy the citation formatted in four popular styles: AMA (American Medical Association), MLA (Modern Language Association), APA (American Psychological Association), or NLM (National Library of Medicine). You can also download the citation as an .

chronological order. Search numbers may be used in place of the search string itself when combining queries (e.g., #1 OR #2). A repeated query will move to the top of History but will retain its original numbering. History is limited to the last 100 searches. Once the maximum number is reached, PubMed will remove the oldest search from history and add the most current search. Actions: Add, delete, or save a query. Adding queries from History places the search string into the Query box to be used in the next search. Deleting a query removes it from History. Query: This column shows previous search strings as entered by the user. Details: PubMed may modify or add search terms to a search to optimize retrieval, e.g., using automatic term mapping. Click the chevron icon " > " to expand search details and see how the search was translated. Results: The total number of citations retrieved for that query. Click the number to run the search and see the results in PubMed. Time: Timestamp of when the search was conducted. Download: Click Download to generate a CSV file of current History items. Please note, Microsoft Excel is typically unable to display or print more than a maximum of 1024 characters in a cell; therefore, you may want to open the CSV file with a text editor to display your complete searches. Delete: Click "Delete" to remove all queries from History; otherwise, History expires after 8 hours of inactivity. Click Advanced to navigate to the Advanced Search page. Use the builder to add search terms to the query box, or type your search directly into the query box. Use the split button to toggle the button function from "Search" to "Add to History". Click Add to History. This will run the search without leaving the Advanced Search page. See your query including the number of results in the History table. Combining searches using History Searches can be combined or used in later searches using your search History. Click Advanced to navigate to the Advanced Search page. In the History table, click the More Actions icon " ... " next to your query. From the available options, select "Add query" to copy the query to the Query box. After you've added content to the Query box, options to use the Boolean operators AND, OR, or NOT will appear when adding more queries to the Query box. Edit your query in the Query box if you would like to make any changes before running the search. Click Search (or Add to History). More information about combining searches from your History: Search numbers may be used in place of the search string itself when combining queries (e.g., #1 OR #2). Citations in the Clipboard are represented by the search number #0, which may be used in searches. For example, to limit the citations you have collected in the clipboard to English language citations, use the following search: #0 AND english [la]. This does not change or replace the Clipboard contents. PubMed may modify or add additional search terms to your search to optimize retrieval, such as: MeSH terms, British/American spellings, singular/plural word forms, and other synonyms. Search Details are included on the Advanced Search page under History. Click the chevron icon " > " next to a query in History to expand the Search Details. When expanded, the details below a query in the History table show the search strategy used to run the search. More information about search details: Translations show individual term mappings using PubMed's search rules and syntax. Query terms without translations will not be listed in this section; for example, exact phrases bypass Automatic Term Mapping (ATM). Warnings are displayed for the original query with potential errors in bold and red type, such as syntax errors, terms not found, or invalid tags. Warnings also appear as a highlighted message in PubMed when the search is run or added to History. Other services PubMed Clinical Queries provides specialized searches for: COVID-19 Articles Clinical Study Categories Medical Genetics Search for COVID-19 articles The COVID-19 article filters limit retrieval to citations about the 2019 novel coronavirus. Results are displayed in a column filtered by research topic categories. See COVID-19 article filters for the filter search strategies; these may evolve over time. To find citations using the COVID-19 article filters: Click Clinical Queries from the PubMed homepage Enter your search terms in the search box Click Search Select a Category: General, Mechanism, Transmission, Diagnosis, Treatment, Prevention, Case Report, Forecasting, or Long COVID Preview results in the COVID-19 Articles column To view the results in PubMed, click the "See all" link below the results preview To use the COVID-19 article filters in a query, add the filter name to your search with the search field tag [Filter], e.g., LitCPrevention[Filter]. The available filters are: LitCGeneral LitCMechanism LitCTransmission LitCDiagnosis LitCTreatment LitCPrevention LitCCaseReport LitCForecasting LitCLongCOVID Clinical Study Categories use a specialized search method with built-in search filters that limit retrieval to citations reporting research conducted with specific methodologies, including those that report applied clinical research. See Clinical Study Categories filters for the filter search strategies. To find citations using the Clinical Study Categories: Click Clinical Queries from the PubMed homepage Enter your search terms in the search box Click Search Select a Category: Therapy, Diagnosis, Etiology, Prognosis, or Clinical Prediction Guides Select a Scope: Narrow (specific search) or Broad (sensitive search) Preview results in the Clinical Study Categories column To view the results in PubMed, click the "See all" link below the results preview The Medical Genetics filters limit retrieval to citations related to various topics in medical genetics. See Medical genetics search filters for the filter search strategies. To use a Medical Genetics filter, add the filter name to your search with the search field tag [Filter], e.g., Genetic Testing[Filter]. The available filters are: Diagnosis Differential Diagnosis Clinical Description Management Genetic Counseling Molecular Genetics Genetic Testing Medical Genetics The Single Citation Matcher has a fill-in-the-blank form for searching for a citation when you have some bibliographic information, such as journal name, volume, or page number. Click Single Citation Matcher on the PubMed homepage. Enter the citation information. Click Go. More information about using the Single Citation Matcher: The journal box includes an autocomplete feature that suggests titles as you enter a title abbreviation or full title. Titles displayed by the autocomplete menu are in ranked order based on the number of citations in PubMed. After selecting a journal with special characters (e.g., ampersand, colon) when using the Back button to return to the Single Citation Matcher you must clear and reenter the title. The author box also includes an autocomplete feature that suggests author names in ranked order based on the number of citations. Full author names may be searched for citations published from 2002 forward if the full author name is available in the article. Click either the 'Only as first author' or Only as last author check box to limit an author name to the first or last author. MeSH (Medical Subject Headings) is the NLM controlled vocabulary thesaurus used for indexing PubMed citations. Use the MeSH database to find MeSH terms, including Subheadings, Publication Types, Supplementary Concepts and Pharmacological Actions, and then build a PubMed search. The MeSH database can be searched by MeSH term, MeSH Entry Term, Subheading, Publication Type, Supplementary Concept, or MeSH Scope Note. More information about the MeSH database: An autocomplete feature is available from the search box. Search results are displayed in relevance-ranked order, therefore, when a users search exactly matches a MeSH Term, that Term is displayed first. Click the MeSH term from the Summary display or choose Full from the display format menu to view additional information and search specifications, such as Subheadings, restrict to Major MeSH Topic, or exclude terms below the term in the MeSH hierarchy. Year Introduced is the year the term was added to MeSH. If more than one year is shown, the term was available for indexing back to the earliest year noted. Articles are indexed using the vocabulary in place at the time of indexing, therefore, the year introduced for a term and the date of publication of a citation indexed with that term may not agree. Launch PubMed searches from the MeSH database To build a PubMed search from MeSH: Run a search in the MeSH database. Select terms using the check boxes. Click "Add to search builder" in the PubMed search builder portlet. You may continue searching and including additional terms to the PubMed search builder using the "Add to search builder" and Boolean pull-down menu. When you are finished, click "Search PubMed." The NLM Catalog includes information about the journals in PubMed and the other NCBI databases. Click Journals in NCBI Databases on the homepage of NLM Catalog or the Journals link on the PubMed homepage to limit your NLM Catalog results to the subset of journals that are referenced in NCBI database records. See the NLM Catalog help for additional information. Other journal resources include: E-utilities are tools that provide access to data outside of the regular NCBI web search interface. This may be helpful for retrieving search results for use in another environment. If you are interested in large-scale data mining on PubMed data, you may download the data for free from our FTP server. Please see the terms and conditions for data users. API root Fielded search Heuristic search Auto search Rate control The PubMed Citation Matcher API finds PubMed identifiers (PMIDs) for citation data in structured or raw form. The interface supports three retrieval methods: field - runs a fielded search using core bibliographic information, such as journal, date, or volume. heuristic - collects all input elements into a single string and returns the closest matching documents. auto - combines the two above methods and switches to heuristic mode if the fielded search has not yielded a result. This is the default method. More information about the Citation Matcher API: The API supports both GET and POST requests. Data is exchanged in JSON. Input data should be UTF-8 encoded. The API returns a maximum of 20 PMIDs; queries returning more than 20 PMIDs are treated as bad requests. The API root is: method=field runs a fielded search using core bibliographic information, such as journal, date, or volume. This functionality is similar to E-utilities ESearch; users should select the API that best suits their needs. For a structured search, the following fields can be used: journal - the name of the journal pdat - the publication date, in the format YYYY/MM/DD volume - the volume of the publication issue - the volume of the publication authors - one or more author names, in the format "Surname Initial" (Doe J). Optionally, the position may be specified as first, last, or auto. Example GET request URL: /citmatch/?method=field&journal=Front+Immunol&volume=13&page=826091&authors=Ihunwo+A POST request data: { "citmatch": { "method": "field", "journal": "Front Immunol", "volume": "13", "page": "826091", "authors": [{ "name": "Ihunwo AO", "position": "first" }] }} Response: { "version": "1.0", "operation": "citmatch", "success": true, "result": { "count": 1, "type": "uids", "uids": [{"pubmed": "35251006"}] }} method=heuristic collects all input elements into a single string and returns the closest matching documents. It is sufficient to supply a raw citation string, such as: "The role of drag in insect hovering. J. Exp. Biol. 2004;207:41474155." Example GET request URL: /citmatch/?method=heuristic&raw-text=Neurogenesis+and+Viral+Infection.+Front+Immunol.+2022+Feb+17;13:82609. POST request data: { "citmatch": { "method": "heuristic", "raw-text": {"text": "Neurogenesis+and+Viral+Infection.+Front+Immunol.+2022+Feb+17;13:82609."} }} Response: { "version": "1.0", "operation": "citmatch", "success": true, "result": { "count": 1, "type": "uids", "uids": [{"pubmed": "35251006"}] }} method=auto first runs a fielded search, and if no results are found, it combines the fields and runs a heuristic search. This is the default method. For a structured search, the following fields can be used: journal - the name of the journal pdat - the publication date, in the format YYYY/MM/DD volume - the volume of the publication issue - the volume of the publication authors - one or more author names, in the format "Surname Initial" (Doe J). Optionally, the position may be specified as first, last, or auto. When using the PubMed Citation Matcher API programmatically, we request that you limit your application's rate to 3 requests / sec and do not make concurrent requests to this service, even at off-peak times. Additionally, requests must contain the name of the calling project in the User-Agent HTTP header value; e.g. Hydra/1.3.15. Use the Batch Citation Matcher to retrieve PMIDs for multiple citations. The Batch Citation Matcher requires that you enter the bibliographic information (journal, volume, page, etc.) in a specific format. To retrieve PubMed PMIDs: Create citation strings for the items you would like to retrieve using the following format: journal_title|year|volume|first_page|author_name|your_key| Fields must be separated by a vertical bar with a final bar at the end of the string. Enter your email address. Email messages may take several minutes to process and be sent to your email address. Upload your citation strings as a text file (.txt) or enter each citation string on a separate line in the text box. If citation strings are entered in the text box and a file is uploaded, the results will be an aggregate of both. Click search. If a match is not found the citation string will display one of the following: your_key|NOT_FOUND;INVALID_JOURNAL - The journal name is not valid. See the journal lists or the NLM Catalog to find the correct journal abbreviation. NOT_FOUND - The journal name is valid, but the citation string did not find a match. AMBIGUOUS - The information provided matches more than one citation. Citation information with 3 or fewer matches include the PMIDs, and more than 3 matches include the total PMID match count. Use the Single Citation Matcher or ESearch to retrieve all citations for searched fields. Notes: Text (.txt) format must be used when uploading a file. You may receive multiple emails for searches containing more than 2,000 citation strings. Enter author names without punctuation as smith jc. Initials are optional. Your key is any string you choose to tag the citation, it is returned unaltered. The journal title field may include the full journal title or the NLM title abbreviation. Each citation field is searched starting with the journal title until a unique match is found. The journal title is a required field however you may omit other fields. If you omit fields you must retain the vertical bars in the citation string. For example, if you omit the volume number 88 from the first example below it should be entered as:proc natl acad sci u s a|1991||3248|mann bj|P32022-1| Example input: proc natl acad sci u s a|1991|88|3248|mann bj|P32022-1| proc natl acad sci u s a|1992|89|3271|gould se|P26261-1| proc natl acad sci u s a|1970|89|3271|smith|P26261-1| res microbiol|1992|143|467|ivey dm|P25966-1| science|1987|235|182|palmenberg ac|P12296-2| eschatology|1993|12|22|public jq|C12233-2| virology|1993|193|492|hardy me|Q02945-1| virus genes|1992|6|393||P27423-1| yeast|1992|8|253|sasnauskas k|P24813-1| Example output: proc natl acad sci u s a|1991|88|3248|mann bj|P32022-1|2014248 proc natl acad sci u s a|1992|89|3271|gould se|P26261-1|1565618 proc natl acad sci u s a|1970|89|3271|smith|P26261-1|NOT_FOUND res microbiol|1992|143|467|ivey dm|P25966-1|1448623 science|1987|235|182|palmenberg ac|P12296-2|3026048 C12233-2|NOT_FOUND;INVALID_JOURNAL virology|1993|193|492|hardy me|Q02945-1|8382410 virus genes|1992|6|393||P27423-1|1335631 yeast|1992|8|253|sasnauskas k|P24813-1|1514324 The National Library of Medicine cannot provide specific medical advice. NLM urges you to consult a qualified health care professional for answers to your medical questions. NLM does not have pamphlets or other materials to mail. MedlinePlus and MedlinePlus en espaol are specifically designed for consumers, containing hundreds of topic pages including NIH-written descriptive information, videos, health check tools, drug, herb and supplement info, links to Fact Sheets from other NIH Institutes, the CDC, etc., and more. Appendices E-mail the PubMed Help Desk Call the NLM Customer service desk: 1-888-FIND-NLM (1-888-346-3656) PubMed Online Training PubMed Trainer's Toolkit NLM Technical Bulletin Untagged terms that are entered in the search box are matched (in this order) against a Subject translation table (including MeSH (Medical Subject Headings)), a Journals translation table, the Author index, and an Investigator (Collaborator) index. When a match is found for a term or phrase in a translation table the mapping process is complete and does not continue on to the next translation table. To see how your terms were translated, check the Search Details available on the Advanced Search page for each query under History. If you want to report a translation that does not seem accurate for your search topic, please e-mail the information to the NLM Help Desk. 1. Subject translation table The Subject Translation Table contains: British and American spellings Pairs: singular and plural word forms, synonyms, and other closely related terms Drug brand name to generic name translations MeSH terms The See-Reference mappings (also known as entry terms) for MeSH terms MeSH Subheadings Publication Types Pharmacologic action terms Terms derived from the Unified Medical Language System (UMLS) that have equivalent synonyms or lexical variants in English Supplementary concept (substance) names and their synonyms. If a match is found in this translation table, the term will be searched as MeSH (that includes the MeSH term and any specific terms indented under that term in the MeSH hierarchy), and in all fields. For example, if you enter child rearing in the search box, PubMed will translate this search to: "child rearing"[MeSH Terms] OR ("child"[All Fields] AND "rearing"[All Fields]) OR "child rearing"[All Fields] If you enter a MeSH Term that is also a Pharmacologic Action PubMed will search the term as [MeSH Terms], [Pharmacologic Action], and [All Fields]. If you enter an entry term for a MeSH term the translation will also include an all fields search for the MeSH term associated with the entry term. For example, a search for odontalgia will translate to: "toothache"[MeSH Terms] OR "toothache"[All Fields] OR "odontalgia"[All Fields] OR "odontalgias"[All Fields] because Odontalgia is an entry term for the MeSH term toothache. Substance name mappings do not include a mapping for individual terms in a phrase, e.g., IL-22 will not include IL[All Fields] AND 22[All Fields]. MeSH term mappings that include a standalone number or single character do not include a mapping for individual terms in a phrase, e.g., Protein C will not include Protein[All Fields] or C[All Fields]. 2. Journals translation table The Journals translation table contains the: full journal title title abbreviation ISSN and eISSN number. These will automatically map to the journal abbreviation that is used to search journals in PubMed and in all fields. For example, a search for endocrine pathology will translate to: "Endocr Pathol"[Journal] OR ("endocrine"[All Fields] AND "pathology"[All Fields]) OR "endocrine pathology"[All Fields] 3. Author index If the term is not found in the above tables, and is not a single term, PubMed checks the author index for a match. The author index includes author names and initials, as well as full author names for articles published from 2002 forward, if available. More information about author searching: PubMed automatically truncates a search for an author's name to account for varying initials, e.g., o'brien j retrieves o'brien ja, o'brien jb, o'brien jc jr, as well as o'brien j. When combining multiple authors, to avoid a match with full author names, include initials or use the [au] search tag, e.g., ryan[au] james[au]. Author names comprised of only stopwords, e.g., as a, are not searched as authors if they are part of phrase, chemical burn as a danger, unless the search only includes the author name, e.g., as a. Enter a full author name in natural or inverted order, e.g., julia s wong or wong julia s. A comma following the last name for searching is optional. For some names, however, it is necessary to distinguish which name is the last name by using the comma following the last name, e.g., james, ryan. Omit periods after initials and put all suffixes at the end, e.g., vollmer charles jr Initials and suffixes are not required, if you include a middle initial or suffix, you will only retrieve citations for articles that were published using the middle initial or suffix. To distinguish author initials that may match a full author name use the [fau] search tag, e.g., peterson do[fau]. 4. Investigator (Collaborator) index If the term is not found in the above tables, except for Author, and is not a single term, the investigator index is consulted for a match. The investigator (collaborator) index includes full names, if available. Enter a full investigator name in natural or inverted order, e.g., harry janes or janes harry. 5. If no match is found? PubMed breaks apart the phrase and repeats the above automatic term mapping process until a match is found. PubMed ignores stopwords in searches. If there is no match, the individual terms will be combined (ANDed) together and searched in all fields. When a search includes terms that were tagged with a search field during the automatic term mapping process and retrieves zero results, the system triggers a subsequent search using "Schema: all ." "Schema: all" modifies the search by removing the automatically added search field tags, and then searches each term in all fields. The learned ranking algorithm combines over 150 signals that are helpful for finding best matching results. Most of these signals are computed from the query-document term pairs (e.g., number of term matches between the query and the document) while others are either specific to a document (e.g., publication type; publication year) or query (e.g., query length). The new ranking model was built on relevance data extracted from the anonymous and aggregated PubMed search logs over an extended period of time. For more information about the Best Match algorithm, please see: The PubMed database contains citations and abstracts to biomedical literature, facilitating searching across several NLM literature resources: MEDLINE PubMed Central (PMC) NCBI Bookshelf For additional information, please see the NLM Fact Sheet: Medline, PubMed, and PMC (PubMed Central): How are they different? PubMed includes citations to original research articles, literature reviews, case reports, letters, editorials, commentaries, and other selected publications on scientific and medical topics (see: publication types found in PubMed). Some categories of content are out of scope for PubMed, such as: book reviews, individual conference abstracts, obituaries and in memoriam articles, news and announcements, and brief summaries of research articles. More examples are included in XML Help for PubMed Data Providers: What types of articles are accepted?. MEDLINE contains citations to journal articles in the life sciences with a concentration on biomedicine. The MEDLINE database contains citations from the late 1940s to the present, with some older material. New citations from MEDLINE journals are received electronically from publishers and appear in PubMed daily. Most citations progress to in-process, and then to indexed for MEDLINE; however, not all citations will be indexed for MEDLINE. PubMed includes some citations from MEDLINE journals that are not indexed for MEDLINE, such as: Citations preceding the date that a journal was selected for MEDLINE indexing. Out-of-scope citations (e.g., articles on plate tectonics or astrophysics) from certain MEDLINE journals, primarily general science and chemistry journals, for which the life sciences articles are indexed for MEDLINE. Citations that have been indexed for MEDLINE and updated with NLM Medical Subject Headings (MeSH), publication types, GenBank accession numbers, and other indexing data are available daily. To limit your search to MEDLINE citations, add medline[sb] to your search. The method used to assign Medical Subject Headings (MeSH) has changed over time. For more information, please see Incorporating Values for Indexing Method in MEDLINE/PubMed XML. Use the following searches to find citations indexed with each method: Automated - MeSH indexing is provided algorithmically. Search: indexingmethod_automated Curated - MeSH indexing is provided algorithmically and a human reviewed (and possibly modified) the algorithm results. Search: indexingmethod_curated Manual MeSH indexing is provided by humans with no algorithmic suggestions. Search: indexingmethod_manual PubMed Central (PMC) is a full text archive that includes articles from journals reviewed and selected by NLM for archiving (current and historical), as well as individual articles and preprints collected for archiving in compliance with funder policies. Some PMC content is not cited in PubMed, such as book reviews and conference abstracts (see: PubMed coverage). As of June 2020, PubMed Central (PMC) includes preprints that report NIH-funded research results. Citations to these preprints are deposited in PubMed. To learn more, see: NIH Preprint Pilot. Bookshelf is a full text archive of books, reports, databases, and other documents related to biomedical, health, and life sciences. PubMed includes citations for books and some individual chapters available on Bookshelf. The PubMed Format tags table defines the data tags that compose the PubMed format. The tags are presented in alphabetical order. Some of the tags (e.g., CIN) are not mandatory and therefore will not be found in every record. Other tags (e.g., AU, MH, and RN) may occur multiple times in one record. You can download records in PubMed format as a text file (.txt) or as an .nbib file for exporting into citation management software programs. Not all fields are searchable in PubMed. See Search field tags for the list of searchable fields. PubMed Format tags Tag Name Description AB Abstract English language abstract taken directly from the published article AD Affiliation Author or corporate author addresses AID Article Identifier Article ID values supplied by the publisher may include the pii (controlled publisher identifier), doi (digital object identifier), or book accession AU Author Authors AUID Author Identifier Unique identifier associated with an author, corporate author, or investigator name BTI Book Title Book Title CI Copyright Information Copyright statement provided by the publisher CIN Comment In Reference containing a comment about the article CN Corporate Author Corporate author or group names with authorship responsibility COI Conflict of Interest Conflict of interest statement CON Comment On Reference upon which the article comments CP Chapter Book chapter CRDT Create Date The date the citation record was first created CRF Corrected and republished from Final, correct version of an article CRI Corrected and republished in Original article that was republished in corrected form CTDT Contribution Date Book contribution date CTI Collection Title Collection Title DCOM Completion Date NLM internal processing completion date DDIN Dataset described in Citation for the primary article resulting from a dataset DRIN Dataset use reported in Citation for an article that uses a dataset from another scientific article DEP Date of Electronic Publication Electronic publication date DP Publication Date The date the article was published DRDT Date Revised Book Revision Date ECF Expression of Concern For Reference containing an expression of concern for an article ECI Expression of Concern In Cites the original article for which there is an expression of concern EDAT Entry Date The date the citation was added to PubMed; the date is set to the publication date if added more than 1 year after the date published EFR Erratum For Cites the original article for which there is a published erratum; as of 2016, partial retractions are considered errata EIN Erratum In Cites a published erratum to the article ED Editor Book editors EN Edition Book edition FAU Full Author Name Full author names FED Full Editor Name Full editor names FIR Full Investigator Name Full investigator or collaborator names FPS Full Personal Name as Subject Full Personal Name of the subject of the article GN General Note Supplemental or descriptive information related to the document GR Grants and Funding Grant numbers, contract numbers, and intramural research identifiers associated with a publication GS Gene Symbol Abbreviated gene names (used 1991 through 1996) IP Issue The number of the issue, part, or supplement of the journal in which the article was published IR Investigator Investigator or collaborator IRAD Investigator Affiliation Investigator or collaborator addresses IS ISSN International Standard Serial Number of the journal ISBN ISBN International Standard Book Number JID NLM Unique ID Unique journal ID in the NLM catalog of books, journals, and audiovisuals JT Full Journal Title Full journal title from NLM cataloging data LA Language The language in which the article was published LID Location ID The pii or doi that serves the role of pagination LR Modification Date Citation last revision date MH MeSH Terms NLM Medical Subject Headings (MeSH) controlled vocabulary MHDA MeSH Date The date MeSH terms were added to the citation. The MeSH date is the same as the Entrez date until MeSH are added MID Manuscript Identifier Identifier assigned to an author manuscript submitted to the NIH Manuscript Submission System NM Substance Name Supplementary Concept Record (SCR) data OAB Other Abstract Abstract supplied by an NLM collaborating organization OABL Other Abstract Language Language of an abstract available from the publisher OCI Other Copyright Information Copyright owner OID Other ID Identification numbers provided by organizations supplying citation data ORI Original Report In Cites the original article associated with the patient summary OT Other Term Non-MeSH subject terms (keywords) either assigned by an organization identified by the Other Term Owner, or generated by the author and submitted by the publisher OTO Other Term Owner Organization that may have provided the Other Term data OWN Owner Organization acronym that supplied citation data PB Publisher Publishers of Books & Documents citations PG Pagination The full pagination of the article PHST Publication History Status Date Publisher supplied dates regarding the article publishing process and PubMed date stamps: received: manuscript received for review revised: manuscript revised by publisher or author accepted: manuscript accepted for publication aheadofprint: published electronically prior to final publication entrez: PubMed Create Date [crdt] pubmed: PubMed Entry Date [edat] medline: PubMed MeSH Date [mhda] PL Place of Publication Journal's (country only) or books place of publication PMC PubMed Central Identifier Unique identifier for the cited article in PubMed Central (PMC) PMCR PMC Release Availability of PMC article PMID PubMed Unique Identifier Unique number assigned to each PubMed citation PS Personal Name as Subject Individual is the subject of the article PST Publication Status Publication status PT Publication Type The type of material the article represents RF Number of References Number of bibliographic references for Review articles RIN Retraction In Retraction of the article RN EC/RN Number Includes chemical, protocol or disease terms. May also include a number assigned by the Enzyme Commission or by the Chemical Abstracts Service. ROF Retraction Of Article being retracted RPF Republished From Article being cited has been republished or reprinted in either full or abridged form from another source RPI Republished In Article being cited also appears in another source in either full or abridged form RRI Retracted and Republished In Final, republished version of an article RRF Retracted and Republished From Original article that was retracted and republished SB Subset Journal or citation subset values representing specialized topics SFM Space Flight Mission NASA-supplied data space flight/mission name and/or number SI Secondary Source ID Identifies secondary source databanks and accession numbers of molecular sequences discussed in articles SO Source Composite field containing bibliographic information SPIN Summary For Patients In Cites a patient summary article STAT Status Tag Used for internal processing at NLM TA Journal Title Abbreviation Standard journal title abbreviation TI Title The title of the article TT Transliterated Title Title of the article originally published in a non-English language, in that language UIN Update In Update to the article UOF Update Of The article being updated VI Volume Volume number of the journal VTI Volume Title Book Volume Title This documentation describes the fields found in PubMed records. If a field is searchable, the search tag appears after the field name in square brackets: Affiliation [ad]. A small number of searchable fields do not correspond to a specific field in the PubMed format. Affiliation may be included for authors, corporate authors and investigators, e.g., cleveland [ad] AND clinic [ad], if submitted by the publisher. Multiple affiliations were added to citations starting from 2014, previously only the first authors affiliation was included. PubMed includes the note "Contributed equally" in the affiliation field when this information is supplied by publishers. Searching for terms in the affiliation field searches in all author affiliations on a citation. For example, a search for Hopkins[ad] AND Bloomberg[ad] can find these terms spread across multiple authors affiliations on the same citation. To search for multiple terms appearing within the same affiliation, use a proximity search. You can also search affiliations using a phrase search; however, we suggest using a proximity search for more comprehensive results because affiliation data may be provided in a variety of ways for the same institution. Example Use proximity searching to find citations with authors from the Johns Hopkins Bloomberg School of Public Health: "Hopkins Bloomberg Public"[ad:~45] This search will find any citation where the words "Hopkins," "Bloomberg," and "Public" appear in the same affiliation, with no more than forty-five words between each term. Search results may include: Johns Hopkins Bloomberg School of Public Health Johns Hopkins University, Bloomberg School of Public Health Bloomberg School of Public Health, Johns Hopkins University Bloomberg Johns Hopkins University School of Public Health ...and more! Untagged terms and terms tagged with [all] are processed using Automatic Term Mapping (ATM). Terms that do not map are searched in all search fields except for Place of Publication, Create Date, Completion Date, Entry Date, MeSH Date, and Modification Date. Terms enclosed in double quotes or including wildcards (*) will be searched in all fields and not processed using automatic term mapping. PubMed ignores stopwords. Includes article identifiers submitted by journal publishers such as DOI (digital object identifier). The format to search for this field is: last name followed by a space and up to the first two initials followed by a space and a suffix abbreviation, if applicable, all without periods or a comma after the last name (e.g., fauci as or o'brien jc jr). Initials and suffixes may be omitted when searching. PubMed automatically truncates a search for an author's name to account for varying initials, e.g., o'brien j [au] will retrieve o'brien ja, o'brien jb, o'brien jc jr, as well as o'brien j. To turn off automatic truncation, enclose the author's name in double quotes and tag with [au] in brackets, e.g., "o'brien j" [au] to retrieve just o'brien j. Searching by full author name for articles published from 2002 forward is also possible, if available. See NLM policy on author names. The author identifier includes a unique identifier associated with an author, corporate or investigator name, if supplied by a publisher. The field includes the organization authority that established the unique identifier, such as, ORCID, ISNI, VIAF, e.g., orcid 0000-0001-5027-4446 [auid]. The book search field includes book citations, e.g., genereviews [book]. Use the following untagged searches to retrieve all book or book chapters, e.g., ataxia AND pmcbookchapter books and chapters: pmcbook books: pmcbooktitle book chapters: pmcbookchapter The above searches capture book records provided by the NCBI Bookshelf database; they exclude a small number of documents from other providers that appear in both PubMed and Bookshelf. For the most comprehensive search of records appearing in both PubMed and Bookshelf, search "pubmed books"[sb]. The data in these fields are citations to other associated journal publications, e.g., comments or errata. Often these link to the respective citation. Comments/Corrections data can be retrieved by the search term that follows each type: Comment in: hascommentin Comment on: hascommenton Corrected and republished in: hascorrectedrepublishedin Corrected and republished from: hascorrectedrepublishedfrom Dataset use reported in: hasassociatedpublication Dataset described in: hasassociateddataset Erratum in: haserratumin Erratum for: haserratumfor Expression of concern in: hasexpressionofconcernin Expression of concern for: hasexpressionofconcernfor Original Report in: hasoriginalreportin Republished in: hasrepublishedin Republished from: hasrepublishedfrom Retracted and republished in: hasretractedandrepublishedin Retracted and republished from: hasretractedandrepublishedfrom Retraction in: hasretractionin Retraction of: hasretractionof Summary for patients in: hassummaryforpatientsin Update in: hasupdatein Update of: hasupdateof Used by NLM for internal processing. Completon Date is not included in All Fields retrieval; the [dcom] search tag is required. The conflict of interest statement from the published article. Conflict of interest statements are available when supplied by the publisher in the citation data sent to PubMed, or when included in full text articles in PubMed Central (PMC). To retrieve all citations that contain conflict of interest statements, use the query hascois. Corporate author identifies the corporate or collective authorship of an article. Corporate names display exactly as they appear in the journal. Note: Citations indexed pre-2000 and some citations indexed in 2000-2001 retain corporate authors at the end of the title field. For comprehensive searches, consider including terms and/or words searched in the title field [ti]. The date the citation record was first created in PubMed. Create Date can be helpful when checking PubMed for citations added since the last time a query was run. Create Date is not included in All Fields retrieval; the [crdt] search tag is required. EC/RN numbers are assigned by: The Food and Drug Administration (FDA) Substance Registration System for Unique Ingredient Identifiers (UNIIs), e.g., Y92OUS2H9B The Enzyme Commission (EC) to designate a particular enzyme, e.g., EC 1.1.1.57 The Chemical Abstracts Service (CAS) for Registry Numbers, e.g., 2751-14-6 The EC/RN number search field includes both the Registry Number and the Related Registry Number (available in the NLM MeSH Browser). The editor search field includes the editors for book or chapter citations. Entry date (EDAT) is used for PubMed processing, such as Most Recent sort order (i.e., last in, first out). EDAT is typically set within 24 hours of the citations availability in PubMed. Exceptions: As of December 15, 2008, citations added to PubMed more than twelve months after the date of publication have the EDAT set to the date of publication, except for book citations. Prior to this, the Entry Date was set to the Publication Date on citations published before September 1997. Entry Date is not included in All Fields retrieval; the [edat] search tag is required. Note: Entry Date was called Entrez Date in the legacy PubMed system (retired in 2020). Technical tags used by LinkOut, filters include: loall[sb] - citations with LinkOut links in PubMed free full text[sb] - citations that include a link to a free full text article full text[sb] - citations that include a link to a full text article The first personal author name in a citation. The full author name for articles published from 2002 forward, if available. Full author searches can be entered in natural or inverted order, e.g., julia s wong or wong julia s. The index for the article's full investigator or collaborator name, if available. Full investigator searches can be entered in natural or inverted order, e.g., harry janes or janes harry. The Grants and funding [gr] search field (previously Grant Number) includes grant numbers, contract numbers, or other intramural research identifiers associated with a publication. The most common type of funding information associated with a publication in PubMed are grant numbers. Data in the Grants and funding search field can consist of up to four parts: Number contains the grant, contract, intramural project number (or both) that designates financial support by any agency of the United States Public Health Service (US PHS), any institute of the National Institutes of Health, or other organization. Funder code contains the 2-letter grant code or funding organization acronym, for example: CA for National Cancer Institute or DDCF for Doris Duke Charitable Foundation. See Grant Number Information Found in the GR Field in MEDLINE/PubMed (Archived) for the 2-character abbreviations, PHS agency acronyms, and other US and non-US funding organizations. Agency includes the acronym or mnemonic in the case of US PHS agencies, or full organization name. As of 2009 this includes the agency's hierarchical structure from lower to higher entity, when known. For example, NCI NIH HHS for National Cancer Institute, National Institutes of Health, U.S. Department of Health and Human Services. Country contains the home country of the funding agency, for example: United States. Each individual part can be searched using [gr], for example: CA101211[gr], CA[gr], NCI[gr], NIH[gr], or United States[gr]. This field can also be searched to find articles with intramural support; e.g., "intramural nih"[gr] finds all journal citations authored by intramural NIH staff. Completeness of funding information in PubMed will vary by source. See Grants and funding for more information about data in this field. Names of principal investigator(s) or collaborators who contributed to the research. Search names following the author field format, for example: soller b[ir]. The ISBN for book or book chapters. The number of the journal issue in which the article was published. The journal search field includes the journal title abbreviation, full journal title, or ISSN/eISSN number (e.g., J Biol Chem, Journal of Biological Chemistry, 0021-9258). If a journal title contains special characters, e.g., parentheses, brackets, enter the name without these characters, e.g., enter J Hand Surg [Am] as J Hand Surg Am. The language search field includes the language in which the article was published. Note that many non-English articles have English language abstracts. You may search using either the language or the first three characters of most languages, e.g., chi [la] retrieves the same results as chinese [la]. The most notable exception is jpn [la] for Japanese. The last personal author name in a citation. Location ID includes the DOI or publisher ID that serves the role of pagination to locate an online article. The date MeSH terms were added to the citation. MeSH Date is initially set to the Entry Date [EDAT] when the citation is added to PubMed; citations added to PubMed more than twelve months after the date of publication have EDAT and MHDA set to the date of publication. MeSH Date is not included in All Fields retrieval; the [mhda] search tag is required. Dates must be entered using the format YYYY/MM/DD [mhda], e.g., 2000/03/15 [mhda]. The month and day are optional (e.g., 2000 [mhda] or 2000/03 [mhda]). To enter a date range, insert a colon (:) between each date, e.g., 1999:2000 [mhda] or 2000/03:2000/04 [mhda]. A MeSH term that is one of the main topics discussed in the article denoted by an asterisk on the MeSH term or MeSH/Subheading combination, e.g., Cytokines/physiology* See MeSH Terms [mh] below. MeSH Subheadings are used with MeSH terms to help describe more completely a particular aspect of a subject. For example, the drug therapy of asthma is displayed as asthma/drug therapy; see MeSH/Subheading Combinations in MeSH Terms [mh] below. The MeSH Subheading field allows users to "free float" Subheadings, e.g., hypertension [mh] AND toxicity [sh]. MeSH Subheadings automatically include the more specific Subheading terms under the term in a search. To turn off this automatic feature, use the search syntax [sh:noexp], e.g., therapy [sh:noexp]. In addition, you can enter the two-letter MeSH Subheading abbreviations rather than spelling out the Subheading, e.g., dh [sh] = diet therapy [sh]. The NLM Medical Subject Headings controlled vocabulary of biomedical terms that is used to describe the subject of each journal article in MEDLINE. MeSH is updated annually to reflect changes in medicine and medical terminology. MeSH terms are arranged hierarchically by subject categories with more specific terms arranged beneath broader terms. PubMed allows you to view this hierarchy and select terms for searching in the MeSH Database. MEDLINE articles are automatically indexed with MeSH terms using a well-refined algorithm. Applying the MeSH vocabulary ensures that articles are uniformly indexed by subject, whatever the author's words. For more information, see Frequently Asked Questions about Indexing for MEDLINE. More information about MeSH Terms and Major MeSH Topic search fields: To search the term only as a MeSH term, it must be tagged using the search field, e.g., [mh] for MeSH Terms or [majr] for MeSH Major Topic. A tagged term is checked against the subject translation table, and then mapped to the appropriate MeSH term(s); entry terms tagged with [mh] also map to the appropriate MeSH term(s), increasing the access points to the citations since a searcher may not know the exact preferred term for a MeSH Descriptor. To search for the exact term only and turn off mapping to multiple MeSH terms, enter the tagged MeSH term in double quotes. MeSH terms are arranged hierarchically by subject categories with more specific terms arranged beneath broader terms. MeSH terms in PubMed automatically include the more specific MeSH terms in a search. To turn off this automatic feature, use the search syntax [mh:noexp], e.g., neoplasms [mh:noexp].For more detailed information about MeSH vocabulary including the hierarchical structure, please see the MeSH homepage. MeSH/Subheading Combinations: To directly attach MeSH Subheadings, use the format MeSH Term/Subheading, e.g., neoplasms/diet therapy. You may also use the two-letter MeSH Subheading abbreviations, e.g., neoplasms/dh. The [mh] tag is not required, however [majr] may be used, e.g., plants/genetics[majr]. Only one Subheading may be directly attached to a MeSH term. For a MeSH/Subheading combination, PubMed always includes the more specific terms arranged beneath broader terms for the MeSH term and also includes the more specific terms arranged beneath broader Subheadings. The broader Subheading, or one of its indentions, will be directly attached to the MeSH term or one of its indentions. For example, hypertension/therapy also retrieves hypertension/diet therapy; hypertension/drug therapy; hypertension, malignant/therapy; hypertension, malignant/drug therapy,

[MeSH Terms] OR "diagnostic errors"[MeSH Terms] OR "diagnostic imaging"[MeSH Terms] OR "diagnostic services"[MeSH Terms] OR "diagnosis, differential"[MeSH Terms] OR "diagnosis"[MeSH Subheading]) Treatment LitCTreatment ("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "treatments"[All Fields] OR "therapy"[MeSH Subheading] OR "therapy"[All Fields] OR "treatment"[All Fields] OR "treatment s"[All Fields] OR "treat*"[All Fields] OR ("clinical trial"[Publication Type] OR "clinical trials as topic"[MeSH Terms] OR "clinical trials"[All Fields]) OR ("clinical trial"[Publication Type] OR "clinical trials as topic"[MeSH Terms] OR "clinical trial"[All Fields]) OR ("randomized controlled trial"[Publication Type] OR "randomized controlled trials as topic"[MeSH Terms] OR "randomized controlled trial"[All Fields] OR "randomised controlled trial"[All Fields]) OR ("randomized controlled trial"[Publication Type] OR "randomized controlled trials as topic"[MeSH Terms] OR "randomized controlled trials"[All Fields] OR "randomised controlled trials"[All Fields]) OR ("therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "therapies"[All Fields] OR "therapy"[MeSH Subheading] OR "therapy"[All Fields] OR "therapy s"[All Fields] OR "therapys"[All Fields]) OR ("therapeutical"[All Fields] OR "therapeutically"[All Fields] OR "therapeuticals"[All Fields] OR "therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "therapeutic"[All Fields])) Prevention LitCPrevention ("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("transmission*"[All Fields] OR "prevent*"[All Fields] OR "intervent*"[All Fields] OR ("prognosis"[MeSH Terms] OR "prognosis"[All Fields] OR "prognoses"[All Fields]) OR "treatment outcome"[All Fields] OR "prevention and control"[MeSH Subheading] OR ("therapeutical"[All Fields] OR "therapeutically"[All Fields] OR "therapeuticals"[All Fields] OR "therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "therapeutic"[All Fields]) OR "therapeutic*"[All Fields]) Case Report LitCCaseReport ("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("case report*"[All Fields] OR ("case reports"[Publication Type] OR "case reports"[All Fields]) OR "report a case"[All Fields] OR ("report*"[All Fields] AND ("ambulatory care facilities"[MeSH Terms] OR ("ambulatory"[All Fields] AND "care"[All Fields] AND "facilities"[All Fields]) OR "ambulatory care facilities"[All Fields] OR "clinic"[All Fields] OR "clinic s"[All Fields] OR "clinical"[All Fields] OR "clinically"[All Fields] OR "clinicals"[All Fields] OR "clinics"[All Fields] OR "patient*"[All Fields])) OR "reported case"[All Fields] OR "clinical presentation*"[All Fields] OR "patient management"[All Fields] OR "infected patient*"[All Fields]) Forecasting LitCForecasting ("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("forecast*"[All Fields] OR ("forecasted"[All Fields] OR "forecaster"[All Fields] OR "forecasters"[All Fields] OR "forecasting"[MeSH Terms] OR "forecasting"[All Fields] OR "forecast"[All Fields] OR "forecasts"[All Fields]) OR "trends"[MeSH Subheading] OR "trends"[All Fields]) OR "trend*"[All Fields] OR "prediction*"[All Fields]) Long COVID LitCLongCOVID "COVID-19 sequela*" OR (("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2") AND sequela*) OR "post acute sequelae of Sars-CoV-2" OR ("PASC" AND ("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2")) OR "post acute sequelae of COVID" OR (("post-intensive care syndrome" OR "postintensive care syndrome") AND ("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2")) OR "post COVID condition*" OR ("PCC" AND ("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2")) OR "convalescent COVID-19" OR "long haul COVID" OR "COVID long haul*" OR "long COVID" OR "long term COVID" OR "COVID-19 survivor*" OR "post COVID-19 symptom*" OR "chronic COVID syndrome" OR "post COVID syndrome" OR "post COVID-19 neurological syndrome" OR "post acute COVID-19" OR "post-acute COVID-19 syndrome"[MeSH Terms] OR "COVID-19 post-intensive care syndrome"[Supplementary Concept] The Clinical Study Categories search filters are based on the work of Haynes RB et al. Category Optimized for Sensitive/ Specific PubMed equivalent Therapy sensitive/broad 99%/70% ((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trials as topic[MeSH Terms] OR clinical trial[Publication Type] OR random*[Title/Abstract] OR random allocation[MeSH Terms] OR therapeutic use[MeSH Subheading]) specific/narrow 93%/97% (randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract])) Diagnosis sensitive/broad 98%/74% (sensitiv*[Title/Abstract] OR sensitivity and specificity[MeSH Terms] OR diagnose[Title/Abstract] OR diagnosed[Title/Abstract] OR diagnoses[Title/Abstract] OR diagnosing[Title/Abstract] OR diagnosis[Title/Abstract] OR diagnostic[Title/Abstract] OR diagnosis[MeSH:noexp] OR (diagnostic equipment[MeSH:noexp] OR diagnostic errors[MeSH:noexp] OR diagnostic imaging[MeSH:noexp] OR diagnostic services[MeSH:noexp]) OR diagnosis, differential[MeSH:noexp] OR diagnosis[Subheading:noexp]) specific/narrow 64%/98% (specificity[Title/Abstract]) Etiology sensitive/broad 93%/63% (risk*[Title/Abstract] OR risk*[MeSH:noexp] OR (risk adjustment[MeSH:noexp] OR risk assessment[MeSH:noexp] OR risk factors[MeSH:noexp] OR risk management[MeSH:noexp] OR risk taking[MeSH:noexp]) OR cohort studies[MeSH Terms] OR group[Text Word] OR groups[Text Word] OR grouped [Text Word]) specific/narrow 51%/95% ((relative[Title/Abstract] AND risk*[Title/Abstract]) OR (relative risk[Text Word]) OR risks[Text Word] OR cohort studies[MeSH:noexp] OR (cohort[Title/Abstract] AND study[Title/Abstract]) OR (cohort[Title/Abstract] AND studies[Title/Abstract])) Prognosis sensitive/broad 90%/80% (incidence[MeSH:noexp] OR mortality[MeSH Terms] OR follow up studies[MeSH:noexp] OR prognos*[Text Word] OR predict*[Text Word] OR course*[Text Word]) specific/narrow 52%/94% (prognos*[Title/Abstract] OR (first[Title/Abstract] AND episode[Title/Abstract]) OR cohort[Title/Abstract]) Clinical Prediction Guides sensitive/broad 96%/79% (predict*[Title/Abstract] OR predictive value of tests[MeSH Terms] OR score[Title/Abstract] OR scores[Title/Abstract] OR scoring system[Title/Abstract] OR scoring systems[Title/Abstract] OR observ*[Title/Abstract] OR observer variation[MeSH Terms]) specific/narrow 54%/99% (validation[Title/Abstract] OR validate[Title/Abstract]) The Clinical Queries search strategies have been updated based on new evidence from Haynes et al. The current strategies have better performance than their predecessors. Details of methods appear in the references below. Revised December 2011 Wilczynski NL, McKibbon KA, Haynes RB. Sensitive Clinical Queries retrieved relevant systematic reviews as well as primary studies: an analytic survey. J Clin Epidemiol. 2011 Dec;64(12):1341-9. doi: 10.1016/j.jclinepi.2011.04.007. Epub 2011 Jul 19. PMID: 21775104. Lokker C, Haynes RB, Wilczynski NL, McKibbon KA, Walter SD. Retrieval of diagnostic and treatment studies for clinical use through PubMed and PubMed's Clinical Queries filters. J Am Med Inform Assoc. 2011 Sep-Oct;18(5):652-9. doi: 10.1136/amiajnl-2011-000233. Epub 2011 Jun 15. PMID: 21680559; PMCID: PMC3168323. Wilczynski NL, Haynes RB; QI Hedges Team. Optimal search filters for detecting quality improvement studies in Medline. Qual Saf Health Care. 2010 Dec;19(6):e31. doi: 10.1136/qshc.2010.042432. Epub 2010 Jul 29. PMID: 20671080. 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Developing optimal search strategies for detecting clinically sound studies in MEDLINE. J Am Med Inform Assoc. 1994 Nov-Dec;1(6):447-58. doi: 10.1136/jamia.1994.95153434. PMID: 7850570; PMCID: PMC116228. The medical genetics searches were developed in conjunction with the staff of GeneReviews: Genetic Disease Online Reviews at GeneTests, University of Washington, Seattle. Category PubMed equivalent Diagnosis (Diagnosis AND Genetics) Differential Diagnosis (Differential Diagnosis[MeSH] OR Differential Diagnosis[Text Word] AND Genetics) Clinical Description (Natural History OR Mortality OR Phenotype OR Prevalence OR Penetrance AND Genetics) Management (therapy[Subheading] OR treatment[Text Word] OR treatment outcome OR investigational therapies AND Genetics) Genetic Counseling (Genetic Counseling OR Inheritance pattern AND genetics) Molecular Genetics (Medical Genetics OR genotype OR genetics[Subheading] AND genetics) Genetic Testing (DNA Mutational Analysis OR Laboratory techniques and procedures OR Genetic Markers OR diagnosis OR testing OR test OR screening OR mutagenicity tests OR genetic techniques OR molecular diagnostic techniques AND genetics) Medical Genetics ((Diagnosis AND genetics) OR (Differential Diagnosis[MeSH] OR Differential Diagnosis[Text Word] AND genetics) OR (Natural History OR Mortality OR Phenotype OR Prevalence OR Penetrance AND genetics) OR (therapy[Subheading] OR treatment[Text Word] OR treatment outcome OR investigational therapies AND genetics) OR (Genetic Counseling OR Inheritance pattern AND genetics) OR (Medical Genetics OR genotype OR genetics[Subheading] AND genetics) OR (DNA Mutational Analysis OR Laboratory techniques and procedures OR Genetic Markers OR diagnosis OR testing OR test OR screening OR mutagenicity tests OR genetic techniques OR molecular diagnostic techniques AND genetics)) Computation of similar articles The neighbors of a document are those documents in the database that are the most similar to it. The similarity between documents is measured by the words they have in common, with some adjustment for document lengths. To carry out such a program, one must first define what a word is. For us, a word is basically an unbroken string of letters and numerals with at least one letter of the alphabet in it. Words end at hyphens, spaces, new lines, and punctuation. The 132 common, but uninformative, words (also known as stopwords) are eliminated from processing at this stage. Next, a limited amount of stemming of words is done, but no thesaurus is used in processing. Words from the abstract of a document are classified as text words. Words from titles are also classified as text words, but words from titles are added in a second time to give them a small advantage in the local weighting scheme. MeSH terms are placed in a third category, and a MeSH term with a subheading qualifier is entered twice, once without the qualifier and once with it. If a MeSH term is starred (indicating a major concept in a document), the star is ignored. These three categories of words (or phrases in the case of MeSH) comprise the representation of a document. No other fields, such as Author or Journal, enter into the calculations. Having obtained the set of terms that represent each document, the next step is to recognize that not all words are of equal value. Each time a word is used, it is assigned a numerical weight. This numerical weight is based on information that the computer can obtain by automatic processing. Automatic processing is important because the number of different terms that have to be assigned weights is close to two million for this system. The weight or value of a term is dependent on three types of information: 1) the number of different documents in the database that contain the term; 2) the number of times the term occurs in a particular document; and 3) the number of term occurrences in the document. The first of these pieces of information is used to produce a number called the global weight of the term. The global weight is used in weighting the term throughout the database. The second and third pieces of information pertain only to a particular document and are used to produce a number called the local weight of the term in that specific document. When a word occurs in two documents, its weight is computed as the product of the global weight times the two local weights (one pertaining to each of the documents). The global weight of a term is greater for the less frequent terms. This is reasonable because the presence of a term that occurred in most of the documents would really tell one very little about a document. On the other hand, a term that occurred in only 100 documents of one million would be very helpful in limiting the set of documents of interest. A word that occurred in only 10 documents is likely to be even more informative and will receive an even higher weight. The local weight of a term is the measure of its importance in a particular document. Generally, the more frequent a term is within a document, the more important it is in representing the content of that document. However, this relationship is saturating, i.e., as the frequency continues to go up, the importance of the word increases less rapidly and finally comes to a finite limit. In addition, we do not want a longer document to be considered more important just because it is longer; therefore, a length correction is applied. This local weight computation is based on the Poisson distribution and the formula can be found in Lin J and Wilbur WJ. The similarity between two documents is computed by adding up the weights (local wt1 local wt2 global wt) of all of the terms the two documents have in common. This provides an indication of how related two documents are. The resultant score is an example of a vector score. Vector scoring was originated by Gerard Salton and has a long history in text retrieval. The interested reader is referred to Salton, Automatic Text Processing, Reading, MA: Addison-Wesley, 1989 for further information on this topic. Our approach differs from other approaches in the way we calculate the local weights for the individual terms. Once the similarity score of a document in relation to each of the other documents in the database has been computed, that document's neighbors are identified as the most similar (highest scoring) documents found. These closely related documents are pre-computed for each document in PubMed so that when you select Similar articles, the system has only to retrieve this list. This enables a fast response time for such queries. PubMed journals Uncompressed GNU zip UNIX Compress PKZIP PubMed and NCBI molecular biology database journals Uncompressed GNU zip UNIX Compress PKZIP Figure.. AHAs My Life Check Lifes Figure.. AHAs My Life Check Lifes Essential 8. Source: Reprinted with permission from Lloyd-Jones Figure.. AHAs My Life Check Lifes Essential 8. Source: Reprinted with permission from Lloyd-Jones et al. Copyright 2022, American Heart Association, Inc. Chart 2-1.. Trends in age-adjusted mean scores Chart 2-1.. Trends in age-adjusted mean scores (95% CI) for the diet component of CVH Chart 2-1.. Trends in age-adjusted mean scores (95% CI) for the diet component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to 2018. Dietary estimates were available only through data up to the 2017 to 2018 NHANES cycle at the time of this report. CI indicates confidence interval; CVH, cardiovascular health; NH, non-Hispanic; and NHANES, National Health and Nutrition Examination Survey. Source: Unpublished American Heart Association tabulation using NHANES. Chart 2-2.. Trends in age-adjusted mean scores Chart 2-2.. Trends in age-adjusted mean scores (95% CI) for the PA component of CVH Chart 2-2.. Trends in age-adjusted mean scores (95% CI) for the PA component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to March 2020. CI indicates confidence interval; CVH, cardiovascular health; NH, non-Hispanic; NHANES, National Health and Nutrition Examination Survey; and PA, physical activity. Source: Unpublished American Heart Association tabulation using NHANES. Chart 2-3.. Trends in age-adjusted mean scores Chart 2-3.. Trends in age-adjusted mean scores (95% CI) for the nicotine exposure component of Chart 2-3.. Trends in age-adjusted mean scores (95% CI) for the nicotine exposure component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to March 2020. CI indicates confidence interval; CVH, cardiovascular health; NH, non-Hispanic; and NHANES, National Health and Nutrition Examination Survey. Source: Unpublished American Heart Association tabulation using NHANES. Chart 2-4.. Trends in age-adjusted mean scores Chart 2-4.. Trends in age-adjusted mean scores (95% CI) for the sleep health component of Chart 2-4.. Trends in age-adjusted mean scores (95% CI) for the sleep health component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to March 2020. CI indicates confidence interval; CVH, cardiovascular health; NH, non-Hispanic; and NHANES, National Health and Nutrition Examination Survey. Source: Unpublished American Heart Association tabulation using NHANES. Chart 2-5.. Trends in age-adjusted mean scores Chart 2-5.. Trends in age-adjusted mean scores (95% CI) for the BMI component of CVH Chart 2-5.. Trends in age-adjusted mean scores (95% CI) for the BMI component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to March 2020. BMI indicates body mass index; CI, confidence interval; CVH, cardiovascular health; NH, non-Hispanic; and NHANES, National Health and Nutrition Examination Survey. Source: Unpublished American Heart Association tabulation using NHANES. Chart 2-6.. Trends in age-adjusted mean scores Chart 2-6.. Trends in age-adjusted mean scores (95% CI) for the non-HDL blood lipids component Chart 2-6.. Trends in age-adjusted mean scores (95% CI) for the non-HDL blood lipids component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to March 2020. CI indicates confidence interval; CVH, cardiovascular health; HDL, high-density lipoprotein; NH, non-Hispanic; and NHANES, National Health and Nutrition Examination Survey. Source: Unpublished American Heart Association tabulation using NHANES. Chart 2-7.. Trends in age-adjusted mean scores Chart 2-7.. Trends in age-adjusted mean scores (95% CI) for the blood glucose component of Chart 2-7.. Trends in age-adjusted mean scores (95% CI) for the blood glucose component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to March 2020. CI indicates confidence interval; CVH, cardiovascular health; NH, non-Hispanic; and NHANES, National Health and Nutrition Examination Survey. Source: Unpublished American Heart Association tabulation using NHANES. Chart 2-8.. Trends in age-adjusted mean scores Chart 2-8.. Trends in age-adjusted mean scores (95% CI) for the BP component of CVH Chart 2-8.. Trends in age-adjusted mean scores (95% CI) for the BP component of CVH among US adults 20 years of age, NHANES 2007 to 2008 through 2017 to March 2020. BP indicates blood pressure; CI, confidence interval; CVH, cardiovascular health; NH, non-Hispanic; and NHANES, National Health and Nutrition Examination Survey. Source: Unpublished American Heart Association tabulation using NHANES. Chart 3-1.. Prevalence (percent) of tobacco use Chart 3-1.. Prevalence (percent) of tobacco use in the United States in the past 30 Chart 3-1.. Prevalence (percent) of tobacco use in the United States in the past 30 days by product,* school level, sex, and race and ethnicity (NYTS, 2022). A, High school students. B, Middle school students. E-cigarette indicates electronic cigarette; and NYTS, National Youth Tobacco Survey. *Past 30-day use of e-cigarettes was determined by asking During the past 30 days, on how many days did you use e-cigarettes? Past 30-day use of cigarettes was determined by asking During the past 30 days, on how many days did you smoke cigarettes? Past 30-day use of cigars was determined by asking During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars? Smokeless tobacco was defined as use of chewing tobacco, snuff, dip, snus, or dissolvable tobacco products. Past 30-day use of smokeless tobacco was determined by asking the following question: During the past 30 days, on how many days did you use chewing tobacco, snuff, dip, snus, or dissolvable products? Responses from these questions were combined to derive overall smokeless tobacco use. Past 30-day use of hookahs was determined by asking During the past 30 days, on how many days did you smoke tobacco in a hookah or water pipe? Past 30-day use of pipe tobacco (not hookahs) was determined by asking In the past 30 days, on how many days did you smoke pipes filled with tobacco? Past 30-day use of heated tobacco products was determined by asking During the past 30 days, on how many days did you use a heated tobacco product? Past 30-day use of nicotine pouches was determined by asking During the past 30 days, on how many days did you use a nicotine pouch? Because of missing data on the past 30-day use questions, denominators for each tobacco product might be different. Black people, White people, and people of other race are non-Hispanic; Hispanic people could be of any race. Non-Hispanic people who selected >1 race were classified as multiracial. In 2022, any tobacco product use was defined as use of any tobacco product (e-cigarettes, cigarettes, cigars [cigars, cigarillos, or little cigars], smokeless tobacco [chewing tobacco, snuff, or dip, snus, or dissolvable tobacco products], hookahs, pipe tobacco, nicotine pouches, bidis [small brown cigarettes wrapped in a leaf], or heated tobacco products) on 1 day during the past 30 days. Any combustible tobacco product use was defined as use of cigarettes, cigars (cigars, cigarillos, or little cigars), hookahs, pipe tobacco, or bidis on 1 days during the past 30 days. In 2022, multiple tobacco product use was defined as use of 2 tobacco products (e-cigarettes, cigarettes, cigars [cigars, cigarillos, or little cigars], smokeless tobacco [chewing tobacco, snuff, or dip, snus, or dissolvable tobacco products], hookahs, pipe tobacco, nicotine pouches, bidis, or heated tobacco products) on 1 days during the past 30 days. Source: Data derived from Park-Lee et al. Chart 3-2.. Age-adjusted prevalence (percent) of current Chart 3-2.. Age-adjusted prevalence (percent) of current cigarette smoking for US adults by state (BRFSS, Chart 3-2.. Age-adjusted prevalence (percent) of current cigarette smoking for US adults by state (BRFSS, 2021). White space between the map and legend has been removed. Icons and drop-down menus for interactive tools have been removed. BRFSS indicates Behavior Risk Factor Surveillance System. Source: BRFSS prevalence and trends data. Chart 3-3.. Prevalence (age-adjusted) of current electronic Chart 3-3.. Prevalence (age-adjusted) of current electronic cigarette use, United States (BRFSS, 2021). Chart 3-3.. Prevalence (age-adjusted) of current electronic cigarette use, United States (BRFSS, 2021). White space between the map and legend has been removed. Icons and drop-down menus for interactive tools have been removed. BRFSS indicates Behavior Risk Factor Surveillance System. Source: BRFSS prevalence and trends data. Chart 3-4.. Age-standardized global mortality rates attributable Chart 3-4.. Age-standardized global mortality rates attributable to tobacco per 100 000, both sexes, 2021. Chart 3-4.. Age-standardized global mortality rates attributable to tobacco per 100 000, both sexes, 2021. During each annual GBD Study cycle, population health estimates are produced for the full time series. Improvements in statistical and geospatial modeling methods and the addition of new data sources may lead to changes in past results across GBD Study cycles. GBD indicates Global Burden of Disease. Source: Data courtesy of the GBD Study. Institute for Health Metrics and Evaluation. Used with permission. All rights reserved. Chart 4-1.. Percentage of US youth 6 Chart 4-1.. Percentage of US youth 6 to 11 and 12 to 17 years of Chart 4-1.. Percentage of US youth 6 to 11 and 12 to 17 years of age who were physically active for at least 60 minutes each day, 2020 to 2021. Error bars represent 95% CIs. Source: Data derived from National Survey of Childrens Health. Chart 4-2.. Percentage of US youth in Chart 4-2.. Percentage of US youth in grades 9 through 12 who met both aerobic Chart 4-2.. Percentage of US youth in grades 9 through 12 who met both aerobic and muscle-strengthening PA recommendations, 2011 to 2019. PA indicates physical activity. Source: Data derived from Youth Risk Behavior Survey., Chart 4-3.. Percentage of US students in Chart 4-3.. Percentage of US students in grades 9 through 12 who watched television for Chart 4-3.. Percentage of US students in grades 9 through 12 who watched television for 3 hours on an average school day, overall and by sex and race and ethnicity, 2019. Error bars represent 95% CIs. Source: Data derived from Youth Risk Behavior Survey. Chart 4-4.. Presence of health-promoting amenities and Chart 4-4.. Presence of health-promoting amenities and detracting elements in neighborhoods of US youth 0 Chart 4-4.. Presence of health-promoting amenities and detracting elements in neighborhoods of US youth 0 to 17 years of age, 2020 to 2021. Health-promoting amenities included parks, recreation centers, sidewalks, and libraries. Health-detracting elements included litter or garbage on the street or sidewalk, poorly kept or rundown housing, and vandalism such as broken windows or graffiti. Error bars represent 95% CIs. Source: Data derived from National Survey of Childrens Health. Chart 4-5.. Percentage meeting the aerobic PA Chart 4-5.. Percentage meeting the aerobic PA guidelines among US adults 18 years of age, Chart 4-5.. Percentage meeting the aerobic PA guidelines among US adults 18 years of age, overall and by sex and race and ethnicity, 2020. From the 2018 Physical Activity Guidelines for Americans, the aerobic guidelines recommend engaging in moderate leisure-time physical activity for 150 min/wk, vigorous activity for 75 min/wk, or an equivalent combination. The muscle-strengthening guidelines recommend activities of moderate or greater intensity involving all major muscle groups on 2 d/wk. NH indicates non-Hispanic; and PA, physical activity. Source: Data derived from Elgaddal et al. Chart 4-6.. Percentage of self-reported physical inactivity Chart 4-6.. Percentage of self-reported physical inactivity among US adults 18 years of age, by Chart 4-6.. Percentage of self-reported physical inactivity among US adults 18 years of age, by state and territory, 2017 to 2020. States in white had insufficient data, defined as a sample size Chart 4-7.. Trends in the percentage of Chart 4-7.. Trends in the percentage of physical inactivity among US adults 18 years of Chart 4-7.. Trends in the percentage of physical inactivity among US adults 18 years of age, overall and by sex, 1998 to 2018. Data are age adjusted to the year 2000 standard population for adults 18 years of age. Physical inactivity is defined as reporting no engagement in leisure-time physical activity in bouts lasting 10 minutes. Source: Data derived from the National Health Interview Survey. Chart 4-8.. Percentage meeting the aerobic PA Chart 4-8.. Percentage meeting the aerobic PA guidelines among US adults 25 years of age, Chart 4-8.. Percentage meeting the aerobic PA guidelines among US adults 25 years of age, by educational attainment, 2018. Data are age adjusted to the year 2000 standard population for adults 18 years of age. The 2018 Physical Activity Guidelines for Americans recommend engaging in moderate leisure-time PA for 150 min/wk, vigorous activity for 75min/wk, or an equivalent combination (eg, aerobic guideline). The 2018 Physical Activity Guidelines for Americans also recommend engaging in muscle-strengthening activities 2 d/wk (eg, muscle-strengthening guideline). Error bars represent 95% CIs. PA indicates physical activity. Source: Data derived from the National Health Interview Survey. Chart 4-9.. Age-standardized global mortality rates attributable Chart 4-9.. Age-standardized global mortality rates attributable to low PA per 100 000, both sexes, Chart 4-9.. Age-standardized global mortality rates attributable to low PA per 100 000, both sexes, 2021. During each annual GBD Study cycle, population health estimates are produced for the full time series. Improvements in statistical and geospatial modeling methods and the addition of new data sources may lead to changes in past results across GBD Study cycles. GBD indicates Global Burden of Disease; and PA, physical activity. Source: Data courtesy of the GBD Study. Institute for Health Metrics and Evaluation. Used with permission. All rights reserved. Chart 5-1.. Estimated mean sodium intake, by Chart 5-1.. Estimated mean sodium intake, by 24-hour urinary excretion, United States, 2013 to 2014. Chart 5-1.. Estimated mean sodium intake, by 24-hour urinary excretion, United States, 2013 to 2014. Estimates based on nationally representative sample of 827 nonpregnant, noninstitutionalized US adults 20 to 69 years of age who completed a 24-hour urine collection in NHANES 2013 to 2014. NHANES indicates National Health and Nutrition Examination Survey. Source: Data derived from Cogswell et al using NHANES. Chart 5-2.. Sources of sodium intake in Chart 5-2.. Sources of sodium intake in adults in 3 geographic regions in the United Chart 5-2.. Sources of sodium intake in adults in 3 geographic regions in the United States, 2013 to 2014. Sources of sodium intake were determined by four 24-hour dietary recalls with special procedures in which duplicate samples of salt added to food at the table and in home food preparation were collected in 450 adults recruited in 3 geographic regions (Birmingham, AL; Palo Alto, CA; and MinneapolisSt. Paul, MN) with equal numbers of males and females from 4 racial and ethnic groups (Asian, Black, Hispanic, and non-Hispanic White individuals). Source: Data derived from Harnack et al. Chart 5-3.. Age-standardized global mortality rates attributable Chart 5-3.. Age-standardized global mortality rates attributable to dietary ris