

Comprehensive systematic review and meta-analysis on physical health conditions in lesbian- and bisexualidentified women compared with heterosexual-identified women Women's Health Volume 19: 1–27 © The Author(s) 2023 Article reuse guidelines: sagepub.com/journals-permissions DOI: 10.1177/17455057231219610 journals.sagepub.com/home/whe



Lena Haarmann¹, Ann-Kristin Folkerts¹, Emma Lieker¹, Kai Eichert¹, Marlene Neidlinger¹, Ina Monsef², Nicole Skoetz², Birgit Träuble³ and Elke Kalbe¹

Abstract

Background: Sexual minority individuals experience discrimination, leading to mental health disparities. Physical health disparities have not been examined to the same extent in systematic reviews so far.

Objectives: To provide a systematic review and, where possible, meta-analyses on the prevalence of physical health conditions in sexual minority women (i.e. lesbian- and bisexual-identified women) compared to heterosexual-identified women. **Design:** The study design is a systematic review with meta-analyses.

Data Sources and Methods: A systematic literature search in MEDLINE, EMBASE, CENTRAL, CINAHL, and Web of Science databases was conducted on epidemiologic studies on physical health conditions, classified in the Global Burden of Disease project, published between 2000 and 2021. Meta-analyses pooling odds ratios were calculated.

Results: In total, 23,649 abstracts were screened and 44 studies were included in the systematic review. Meta-analyses were run for arthritis, asthma, back pain, cancer, chronic kidney diseases, diabetes, headache disorders, heart attacks, hepatitis, hypertension, and stroke. Most significant differences in prevalence by sexual identity were found for chronic respiratory conditions, especially asthma. Overall, sexual minority women were significantly 1.5–2 times more likely to have asthma than heterosexual women. Furthermore, evidence of higher prevalence in sexual minority compared to heterosexual women was found for back pain, headaches/migraines, hepatitis B/C, periodontitis, urinary tract infections, and acne. In contrast, bisexual women had lower cancer rates. Overall, sexual minority women had lower odds of heart attacks, diabetes, and hypertension than heterosexual women (in terms of diabetes and hypertension possibly due to non-consideration of pregnancy-related conditions).

Conclusion: We found evidence for physical health disparities by sexual identity. Since some of these findings rely on few comparisons only, this review emphasizes the need for routinely including sexual identity assessment in health research and clinical practice. Providing a more detailed picture of the prevalence of physical health conditions in sexual minority women may ultimately contribute to reducing health disparities.

³Department of Psychology | Research Unit for Developmental Psychology, Faculty of Human Sciences Cologne, University of Cologne, Cologne, Germany

Corresponding author:

Elke Kalbe, Department of Medical Psychology | Neuropsychology and Gender Studies and Center for Neuropsychological Diagnostics and Intervention (CeNDI), Faculty of Medicine and University Hospital Cologne, University of Cologne, Kerpener Str. 62, Cologne 50937, Germany.

Email: elke.kalbe@uk-koeln.de

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).

Department of Medical Psychology I Neuropsychology and Gender Studies and Center for Neuropsychological Diagnostics and Intervention (CeNDI), Faculty of Medicine and University Hospital Cologne, University of Cologne, Cologne, Germany

²Evidence-Based Medicine, Department of Internal Medicine, Faculty of Medicine and University Hospital Cologne, University of Cologne, Cologne, Germany

bisexual women, lesbian women, meta-analysis, physical health disparities, sexual identity, sexual minority women, systematic review

Date received: 29 June 2023; revised: 3 November 2023; accepted: 23 November 2023

Introduction

For many years, research on the health of sexual minority adults predominantly focused on sexually transmitted diseases (especially HIV in men) or—more recently—on mental health.¹ Regarding mental health, systematic reviews consistently reported disparities between sexual minority and heterosexual individuals. For example, a meta-analysis found that adults who identify as lesbian or gay have a higher prevalence of mental disorders than their heterosexual counterparts.² Another systematic review found a twofold increased rate of suicide attempts among lesbian, gay, and bisexual individuals. The risk for depression, anxiety disorders, and addiction was also 1.5 times higher compared to heterosexual individuals.³

Today, mental and physical health is no longer understood as distinct entities. Instead, their interconnection or even interdependence is recognized. There are numerous reports from various populations of adverse physical health outcomes due to elevated psychological distress. For example, associations have been found between poorer mental health and immune system dysfunction,⁴ decreased antibody responses following vaccinations,⁵ increased vulnerability to colds, the flu, and headaches,^{6,7} as well as increased vulnerability to heart diseases and cancer.8 Similar evidence has been provided for sexual minority populations specifically: in a US study, the higher distress sexual minority adults experienced compared to heterosexual adults explained most of the physical health differences observed between lesbian and heterosexual women (e.g. digestive symptoms, chronic fatigue syndrome, arthritis).9

Lick et al.¹ provide a theoretical framework proposing that health disparities between sexual minority and heterosexual individuals are related to minority stress processes that follow exposure to social stigma. Accordingly, elevated minority stress (e.g. discrimination, rejection, internalized homophobia) has been associated with higher numbers of chronic diseases and poorer overall health.¹⁰ Regarding preconditions for good or bad physical healthapart from elevated (minority) stress-sexual minority individuals were found to be more likely to engage in disadvantageous health behavior,11 such as excessive drinking,¹² smoking,¹³ and exercising less.¹⁴ Furthermore, a US study indicated that sexual minority persons have poorer access to health care as well as less insurance coverage.¹⁵ A comprehensive meta-analytic review on perceived discrimination and health concluded that discrimination is

associated with mental and physical health both directly as well as indirectly via heightened stress responses and participation in unhealthy and non-participation in healthy behaviors.¹¹

Only recently, studies on physical health among sexual minority individuals have increased considerably, and systematic reviews covering a broad range of physical diseases are rare. There are three reviews that each comprise selected physical health conditions in sexual minority women (SMW) compared to heterosexual women.¹⁶⁻¹⁸ In one review from 2017, out of five health problems, only asthma was more common in SMW, whereas no significant differences were found for diabetes, hypertension, cardiovascular disease (CVD), and most cancers.¹⁶ The most recent review from 2018 included meta-analyses and found similar results, that is, higher asthma rates in lesbian and bisexual women, but no differences in CVD, diabetes mellitus, and hypertension.¹⁷ Another review (2014) including 11 studies found that almost every comparison was in a direction indicating better physical health in heterosexual compared to SMW.¹⁸

Since these reviews have focused on only a few selected diseases each, and a considerable number of further studies have been released since then, there is a need for an up-to-date review that provides a comprehensive summary. Thus, this study aims to provide a systematic review and meta-analyses on the prevalence of physical health conditions, comparing lesbian-identified or/and bisexualidentified women or SMW (lesbian- and bisexual-identified aggregated) to heterosexual-identified women.

Methods

Reporting follows the PRISMA guideline for systematic reviews and meta-analyses.¹⁹ Since this is a systematic review, no ethics approval from the ethics committee of the University was needed. The project was preregistered in the PROSPERO database (CRD42021281490) (Registration includes consideration of women and men; results on men are reported elsewhere.).

Study eligibility and inclusion criteria

Regarding physical health conditions, we followed the Global Burden of Disease (GBD) classification. The GBD is a comprehensive regional and global burden of disease research program that assesses mortality and disability from major diseases, injuries, and risk factors. It was Table I. Physical health conditions eligible for inclusion according to Global Burden of Disease classification.

Cardiovascular diseases

Aortic aneurysm, atrial fibrillation, cardiomyopathy, endocarditis, hypertensive heart disease, ischemic heart disease, nonrheumatic valve diseases, other cardiovascular, peripheral artery disease, rheumatic heart disease, stroke

Chronic respiratory diseases

Asthma, chronic obstructive pulmonary disease (COPD), interstitial lung disease, other chronic respiratory, pneumoconiosis

Diabetes and chronic kidney diseases

Acute glomerulonephritis, chronic kidney disease, diabetes

Digestive diseases

Appendicitis, *cirrhosis*, gallbladder and biliary, hernia, ileus and obstruction, inflammatory bowel, other digestive diseases, pancreatitis, upper digest diseases, vascular intestinal

Enteric infections

Diarrheal diseases, invasive non-typhoidal salmonella (iNTS), other intestinal infect, typhoid and paratyphoid

Maternal and neonatal disorders Maternal disorders, neonatal disorders

Musculoskeletal disorders

Gout, low back pain, neck pain, osteoarthritis, other musculoskeletal disorder, rheumatoid arthritis

Neglected tropical diseases and malaria

African trypanosomiasis, Chagas disease, cystic echinococcosis, cysticercosis, dengue, ebola, food-borne trematodiases, guinea worm, intestinal nematode, leishmaniasis, leprosy, lymphatic filariasis, malaria, onchocerciasis, other neglected tropical diseases (NTD), rabies, schistosomiasis, trachoma, yellow fever, zika virus

Neoplasms

Bladder cancer (c.), brain c., *breast c.*, cervical c., colorectal c., esophageal c., gallbladder c., hodgkin lymphoma, kidney c., larynx c., leukemia, lip oral cavity c., liver c., lung c., lymphoma, melanoma, mesothelioma, myeloma, nasopharynx c., other malignant neoplasms, *other neoplasms*, other pharynx c., ovarian c., pancreatic c., prostate c., *skin c.*, stomach c., testicular c., thyroid c., uterine c.

Neurological disorders

Alzheimer's disease, headache disorders, epilepsy, motor neuron disease, multiple sclerosis, other neurological, Parkinson's disease

Nutritional deficiencies

Dietary iron deficiency, iodine deficiency, other nutritional, protein-energy malnutrition, vitamin A deficiency

Other infectious diseases

Acute hepatitis, diphtheria, encephalitis, measles, meningitis, other unspecified infectious diseases, tetanus, varicella, whooping cough

Other non-communicable diseases

Congenital defects, gynecological diseases, endocrine/metabolic/blood/immune diseases, hemoglobinopathies, oral disorders, SIDS, urinary diseases

Respiratory infections and tuberculosis

lower respiratory infect, otitis media, tuberculosis, upper respiratory infect

Sense organ diseases

Age-related hearing loss, blindness and vision impairment, other sense organ diseases

Skin diseases

Acne vulgaris, alopecia areata, bacterial skin disease, decubitus ulcer, dermatitis, fungal skin diseases, other skin diseases, pruritus, psoriasis, scrabies, urticaria, viral skin diseases

Transport injuries

Other transport injuries, road injuries

Unintentional injuries

Adverse medical treatment, animal contact, drowning, environ heat and cold, falls, fire and heat, foreign body, mechanical forces, nature disaster, other unintentional, poisonings

Self-generated table based on the Global Burden of Diseases Classification that is publicly available and was published online by the Institute for Health Metrics and Evaluation, Washington School of Medicine.²¹ (GBD main categories (and their associated subcategories) we did not include were self-harm and interpersonal violence, substance use disorders, mental disorders, and sexually transmitted diseases). Comparisons have been found on all *conditions in italics*.

initiated by the Harvard University, the World Health Organization (WHO), and the World Bank.²⁰ We included studies on health conditions of all GBD main- and subcategories as listed in Table 1. Inclusion criteria were full-text epidemiologic studies (cross-sectional or cohort studies) in English or German published between 1 January 2000 and 27 February 2021 that compared lesbian-identified (lesbian) and/or bisexual-identified (bisexual) women or SMW (lesbian- and bisexual-identified aggregated) to heterosexual/straightidentified (heterosexual) women regarding prevalence of at least one diagnosed (self-reported or examined) health condition according to the GBD classification. Given the steadily evolving nature of research on sexual minority individuals, the year 2000 was chosen as a start date to be in alignment with the current century. Age cutoff was ≥ 18 years, as our focus was on sexual minority adults. Furthermore, this aligns with most representative health surveys which conventionally employ the same age cutoff of ≥ 18 years.

In those studies that reported gender identity, we focused on cisgender women only since transgender individuals face unique health risks irrespective of their sexual identity, and we sought to minimize confounding. To maximize precision, we considered different dimensions of sexual orientation (identity/attraction/behavior) as distinct units of analysis. Thus, we focused on one of them, that is, identity, since sexual identity was considered particularly relevant in the framework of minority stress¹ as a main predictor of physical health disparities. Previous research also confirmed that sexual identity (vs attraction and behavior) was the measure perceived to be most closely related to discrimination and stigma.²² Hence, we excluded studies that defined sexual orientation via sexual attraction and/or behavior only. We furthermore excluded studies that consisted of HIV-samples only (to avoid bias, results will be reported elsewhere) and studies that reported only risk factors for the diseases in question.

Database search and screening procedure

An extensive database search in MEDLINE, EMBASE, CENTRAL, CINAHL, and Web of Science (WOS), covering publications released January 2000 to February 2021 was conducted by an information specialist (IM). It included all relevant health conditions individually as well as relevant MeSH terms. The detailed search string is provided in Supplementary Appendix SA1. All studies found were uploaded into the systematic review software Covidence (Veritas Health Innovation, Melbourne, Australia) for abstract screening and full-text screening, which was conducted by two reviewers each: all studies were screened by reviewer L.H. (abstracts and full texts) and screened again by another reviewer A.-K.F., E.L. or K.E. (abstracts) and E.L. (all full texts). Throughout screening process, disagreements or uncertainties on study eligibility were resolved through discussion of at least two reviewers.

Data extraction and synthesis

Data were extracted by one review author (L.H., K.E., M.N.) using extraction sheets in Excel (V. 16.66.1),

checked afterwards by another (L.H., K.E., M.N.), and then double-checked by a third review author (K.E., M.N.). Extracted information included sampling method (including weighting details), dates of data collection, sample sizes, age range, assessment of sexual identity, assessment of health conditions, and variables adjusted for.

Regarding comparative statistics, we extracted data from all studies that reported either odds ratios (OR) or absolute numbers or percentages of prevalence (to approximate ORs ourselves). If neither ORs nor absolute numbers were reported or if rounding errors were to be expected (when calculating ORs from percentages), we requested primary data from the respective author(s).

For studies with multiple options for data extraction (e.g. OR *and* percentages given), the following hierarchical order was applied for extracting ORs: (1) copied OR from article, (2) calculated OR from absolute numbers copied from article, (3) calculated OR from received primary data (author-request), (4) calculated OR from weighted percentages, and (5) calculated OR from unweighted percentages. Regarding percentages, we reported weighted percentages when available and unweighted otherwise. In addition, if available, adjusted odds ratios (AORs) were extracted. For articles that reported more than one AOR, we selected those that adjusted for the highest number of demographic variables.

In cases of overlapping sample sources *and* overlapping data collection dates in two or more articles, we checked whether additional information according to predetermined criteria was given. These criteria, that qualified comparisons for keeping them, were: if they included (1) a health condition (assessed in years) not reported in any other study, (2) numbers for lesbian and bisexual women separately (in contrast to SMW aggregated only), and (3) AORs (in contrast to studies with no or less specified AORs).

Statistical analysis/meta-analysis

Whenever we could extract data from at least two nonoverlapping studies per health condition, we conducted a meta-analysis on the respective condition. In metaanalyses, only weighted data were included. In case of overlapping sample sources and overlapping dates of data collection, the larger sample was pivotal for inclusion in meta-analysis (if two or more smaller samples collected in consecutive years cumulatively constituted the largest sample, those samples were included). Since the AORs of the studies did not adjust for the same variables (and thus were less comparable), we conducted meta-analyses on ORs using Review Manager 5.4.23 As we expected some heterogeneity in the study designs and samples, randomeffects models, applying the Mantel-Haenszel method, were calculated. Tests for subgroup differences (lesbian, bisexual, and SMW) were run. Results were considered significant, when p < 0.05 and standard thresholds were

Results

General findings and description of included studies

The database search yielded a total of 28,692 references (Figure 1, flow chart). Of those, 5043 were duplicates and removed immediately; titles and abstracts of 23,649 references were screened (title and abstract screening), and of those, 478 were furtherly reviewed (full-text screening). We requested data from 39 authors. Almost half of them (n=17) replied: 12 authors stated that they no longer had access to the data or that data were no longer

available,^{9,26–36} and five authors sent data.^{37–41} Finally, 44 studies were included.^{9,13,26,28,31,36–39,41–74} The vast majority (39/44) derived from large national (or regional) representative health surveys^{9,13,28,31,36–39,41–47,49,50,53–73} and the remaining (5/44) were single cross-sectional or cohort studies.^{26,48,51,52,74} The included studies comprise data from four different countries (the United States (*n*=39), Australia (*n*=2), the United Kingdom (*n*=2), Belgium (*n*=1)). Total sample sizes ranged between *N*=84⁷⁴ and *N*=12,640,900⁴¹ (weighted estimates); sample size ranges of sexual identity subgroups were: *n*=38³⁹ to *n*=194,100⁴¹ for lesbian women, *n*=36⁵⁰ to *n*=314,800⁴¹ for bisexual women, *n*=86⁶⁶ to *n*=2,822⁵⁴ for SMW, and *n*=42⁷⁴ to *n*=12,132,000⁴¹ for heterosexual women.

Information on the study sources, dates of data collection, and the sample size of each study are displayed in Table 2. Detailed descriptive information on each study is provided in Supplementary Table S1. There was one study



Figure 1. PRISMA flowchart.

Corcher 20H Cercher 20H Cercher 20H Cercher 20H N=114, Iner: 105, N=38, 19, Iner: 57, 203, 200, 200, 200, 200, 200, 200, 200	N = 1144, het.: 1058, les.: 48, bi.: 38 N = 58,319, het.: 57,466, SMW: 853 N = 618, het.: 364, les.: 254 N = 93,242, het.: 90,608, les.: 1265, bi.: 1369 N = 7503, het.: 7157, SMW: 346 N = 5727, het.: 25402, les.: 347, bi.: 322 N = 26,271, het.: 25,602, les.: 347, bi.: 322 N = 2127, het.: 25,602, les.: 347, bi.: 322
Terdinamending Carbo - Curson	N = 1144, net:: 1038, les:: 48, DI: 38 N = 58,319, het:: 57,466, SMW: 853 N = 618, het:: 364, les:: 254 N = 93,242, het:: 90,608, les:: 1265, bi:: 1369 N = 7503, het:: 7157, SMW: 346 N = 2827, het:: 25450, SMW: 377 N = 2827, het:: 25450, les:: 347, bi:: 322 N = 9127, het:: 25,602, les:: 347, bi:: 322
Restructure Constraint Constraint <thconstraint< th=""> Constraint Constr</thconstraint<>	N = 56,51 Y, net: 27,406, Sr1YY: 633 N = 618, het: 364, les: 254 N = 93,242, het: 90,608, les: 1265, bi: 1369 N = 7503, het: 7157, SNWY: 346 N = 5827, het: 25460, les: 347, bi: 322 N = 26,271, het: 25,602, les: 347, bi: 322 N = 2125, het: 25,602, les: 347, bi: 322
Agrant Solution	N = 618, het:: 564, les:: 254 N = 93,242, het:: 90,608, les:: 1265, bi:: 1369 N = 7503, het:: 7157, SMWY: 346 N = 5827, het:: 5450, SMWY: 377 N = 26,271, het:: 25,602, les:: 347, bi:: 322 N = 2127, het:: 25,602, les:: 347, bi:: 322
Bestime et al.* CHS, CA, USA 2001-2010 N=95.24, her. 36, soot N=95.24, her. 36, soot Operatine et al.* NHANES, USA 2001-2010 N=527, her. 36, soot N=527, her. 36, soot Operatine et al.* NHANES, USA 2000-2010 N=527, her. 32, soot N=527, her. 32, soot Scivent et al.* NHANES, USA 2000-2014 N=7303, her. 312, her. 392, her. 312, her. 392, here. 31, soot Scivent et al.* NHANES, USA 2001-2010 N=527, her. 32, her. 392, here. 31, her. 392, here. 31, her. 392, here. 31, her. 392, here. 31, here. 30, soot Best te al.* NHANES, USA 2001, 2003, 2003, 2003, 2011 N=731, here. 30, here. 31, here. 30, here. 31, here. 30, here. 31, here, 30, here, 31, here, 30, here. 31, here, 30, here, 31, here,	N = 93,242, het: 90,608, les:: 1265, bi: 1369 N = 7503, het: 7157, SMVY: 346 N = 5827, het: 5450, SMVX: 377 N = 26,271, het: 55,602, les: 347, bi: 322 N = 26,271, het: 75,602, les: 347, bi: 322
Cacenes et al." INANKE, USA 2001–2012 N=5703, her. 7570, her. 751, her.	N = 7503, het.: 7157, SMW: 346 N = 5827, het.: 5450, SMW: 377 N = 26,271, het.: 25,602, les.: 347, bi:: 322 N = 9125, het.: 7569 les.: 347, bi:: 322
Operation et al. ¹⁶ NuMNE: USA 2001-2010 N=3627, here: 540, N=3627, here: 540, N=3627, here: 540, N=3627, here: 739, N=3102, here: 730, N=3101, here: 730, N=310, here: 730, N=300, 2002, 2001, 2003, 2003, 2001, 2003, 2003, 2001, 2003, 2003, here: 711, here, 60, N=300, here, 711, here, 60, here, 70,	N = 5827, het.: 5450, SMVV: 377 N = 26,271, het.: 25,602, les.: 347, bi:: 322 N = 9127, bis.: 7959 les.: 43, bis. 100
Methol 2005 2008 N=32.71, her: 254 Motarie et al.* Orseen BFFS, USA 2003 2003 N=32.71, her: 254 Motarie et al.* CAUSH, Australia 2003 2003 N=31.91, her: 254 Schwartz et al.* CHIS, CA, USA 2014 N=31.91, her: 254 N=31.93, her: 517.336 Beanch et al.* BRFS, states including SON, USA 2011 2014 N=31.91, her: 253.3395 Bosonch et al.* BRFS, States including SON, USA 2010 2003 2003 N=31.11, her: 10.7 Bosonch et al.* CHIS, CA, USA 2001 2003 2003 2013 N=31.1, her: 10.7 Bosonch et al.* AlSWH, Australia 2001 2003 2003 N=31.1, her: 10.7 Bosonch et al.* AlSWH, Australia 2001 2003 2003 N=31.1, her: 10.7 Data and Hao" BRFS, USA 2014 1997 to 104 1997 to 104 1997 to 104 1997 N=431.1, her: 10.7 Data and Hao" State at 13 State at 13 Nathington RFS, USA N=311.1, her: 10.7 Data and Hao" State at 13	N = 26,271, het: 25,602, les: 347, bi: 322 N = 9122, het: 7959 loc: 43, bi: 100
And Mode 2003 Mells	NI-0133 hat 7050 los 23 hi 100
Schwarz et al. ³ NHMUE, USA 2001-2014 N=3102, her: 310, her:	14 – 01 ZZ, 116(/ 227, 162 03, 01 100
Woltstein et al. ⁴ CHIS, CA, USA 2011 2014 N=12,640,000, her: 87,3 Beanch et al. ⁴ Bertis, states including SOM, USA 2014 N=12,640,500, her: 87,3 Beanch et al. ⁴ Bertis, states including SOM, USA 2014 N=82,333, her: 85,713 Bennich et al. ⁴ RFSS, states including SOM, USA 2010 N=12,460,500, her: 81,713 Bennich et al. ⁴ ALSWH, Australia 2002, 2005, 2003, 2003 N=17,112, her: 05,113 Da and the al. ⁴ ALSWH, Australia 2002, 2005, 2003, 2011 N=53,733, her: 57,13 Da and Habo ¹ Single cohort study, Belgium 2004, 2005, 2003, 2005 N=14,15, her: 10,16 Da and Wold ⁴ LACHS, CA, USA 2003, 2005, 2007, 2009 N=4135, her: 37,13 Dible et al. ³ Single cohort study, USA 1995-1007 N=449, her: 38,16 Dible et al. ³ Single cohort study, USA 1995-1001 N=449, her: 38,16 Dible et al. ³ Single cohort study, USA 1995-1001 N=443, her: 37,16 Dible et al. ³ Single cohort study, USA 1003, 2005, 2007, 2009 N=443, her: 37,16 Dible et al. ³ Single cohort s	N=3102, het.: 2950, les.: 38, bi.: 114
Basch et al. ⁴ BRFS, states including SOM, USA 2014 N=85339, her. 387 Bosinich et al. ⁴ BRFS, states including SOM, USA 2010 N=1051 N=85739, her. 387 Bosinich et al. ⁴ Berkins, states including SOM, USA 2000 2003 2003 N=1054 N=8755, states including SOM, USA 2001 N=1054 N=10545 her. 107 N=10545 her. 102 N=10545 her. 1065 N=10545 her. 107 N=10553 h	N=12.640.900. het.: 12.132.000. les.: 194.100. bi.: 314.800
Bosinci et al. ⁴ BRSS, sares including SOM, USA 2010 Marralia 2002, 2005 2008, 2011 N=527/05 here: 51/2 Beckiner et al. ⁴ CHS, CA, USA 2003, 2005, 2008, 2011 N=59/391 here: 57/3 Da and Halth, USA 2002, 2003, 2005, 2008, 2011 N=59/391 here: 57/3 Da and Halth, USA 2002, 2003, 2005, 2003, 2011 N=59/391 here: 57/3 Da and Halth, USA 2002, 2003, 2006, 2011 N=59/391 here: 57/3 Da and Halth, USA 2002, 2003, 2005, 2004, 2011 N=59/391 here: 57/3 Da and Halth, USA 2002, 2003, 2005, 2004, 2011 N=59/391 here: 57/3 Da and Halth, USA 2002, 2003, 2005, 2004, 2011 N=29/391 here: 57/3 Da and Halth, USA 2002, 2003, 2005, 2004, 2015 N=24/65, here: 4610, Damant et al. ¹⁰ Single cohort study, USA 12077 to December 1999 N=44/657 here: 4610, Dible et al. ²¹ Single cohort study, USA 2002, 2007, 2009, 2011-2012 N=44/657 here: 4610, Dible et al. ²¹ Single cohort study, USA 2003, 2003, 2003, 2003, 2003, 2003, 2003, 2003, 2003, 2004, Pere: 4610, Dible et al. ²¹ Single cohort study, USA 2003, 2003, 2005, 2009, 2011-2012 N=44/657 here: 4610, Dible et al. ²¹ Nvahingon BRFS, USA 2003, 2003, 2007, 2009, 2011-2012 N=44/657 here: 47, Dible et al. ²² Nvahingon BRFS, USA 2003, 2003, 2007, 2009, 2011-2012 N=44/657 here: 47, Dislex 41, Dislex	N=85.939. het: 83.903. les: 779. bi: 1.257
Bedimer et al.* CHS, CA, USA Soli, 2003, 2003, 2003, 2003, 2004, 2011 N=71,112, her: 60,1 Brown et al.* Add Hath, USA 2001, 2003, 2003, 2003, 2003, 2003, 2011 N=59,451, her: 60,1 Dai and Ho** RFSS, USA 2001, 2003, 2014, 2014, her: 97, he	N = 57 705 her 51 639 les 615 hi 451
Bown et al ⁶ Add Health Zool, 2005 Sool, 2005 Sool, 2001 N=10,451, her: 10, her: 1	N=71112 het 60 078 les 918 hi 116
Definition Addition Birss, Usic 2002, 2006, 2006 N=135, her: 817, 161, 161, 161, 161, 161, 161, 161, 1	NT / 1,1 12, 1164: 07,07 0, 165 710, 01 1,110 NT 10 4F1 1 10 200 CMMAC 2F1
Clark et al." Add Hauth, USA 2008, 2009 N = 5938, hec.; 3/13 Dai and Head BRFSS, USA 2008, 2009 N = 511, hec.; 5/13 Dai and Head Single colort study, USA 1999 to December 1999 N = 8115, hec.; 4023 Damant and Wold* LACHS, CA, USA Spetember 1999 N = 649, hec.; 4033 Dibble et al." Single colort study, USA 1995-1997 N = 4615, hec.; 4033 Dibble et al." Single colort study, USA 1995-1997 N = 649, hec.; 403 Dibble et al." Single colort study, USA 1995-1997 N = 4615, hec.; 403 Dibble et al." Single colort study, USA 1995-1997 N = 464, hec.; 4616 Dibble et al." Washington BRFS, USA 2003, 2005, 2007, 2009 N = 481, hec.; 473 Dillson et al." Washington BRFS, USA 2003, 2005, 2007, 2009 N = 649, hec.; 873 Freichitsen-Goldsen et al." Washington BRFS, USA 2003, 2005, 2007, 2009 N = 649, hec.; 816 Freichitsen-Goldsen et al." Washington BRFS, USA 2003, 2005, 2007, 2009 N = 649, hec.; 816 Go candel math?" Mastrei al." Washington BRFS, USA	N = 10,451, net: 10,200, 51199: 251
Data and Hao ⁴ BRFS, USA 2014 N = 85,730, her. 87,33 Data and Hao ⁴ Single cohort study, Begium 2014 N = 81, her. 161, le De Sutter at al.* Single cohort study, USA April 1997 to July 1997 N = 437, her. 4610 Dibble et al.* LACHS, CA, USA April 1997 to July 1997 N = 437, her. 4413, her. 741, her. 947, her. 97 Dibble et al.* Single cohort study, USA 2003, 2005, 2007, 2009, 2011–2012 N = 485, her. 475, her. 475, her. 97 Dibble et al.* NHS, USA 2003, 2005, 2007, 2009, 2011–2012 N = 4665, her. 475, her. 97 Distort al.* NHS, USA 2003, 2005, 2007, 2009, 2011–2012 N = 4665, her. 77, her. 97 Gonzles and Hamily-Sinthy NHS, USA 2013, 2014 N = 7865, her. 77, her. 97 Gonzles and Hamily-Sinthy NHS, USA 2013, 2015, 2007, 2009, 2011–2012 N = 19,921, her. 13, her. 71, Ja, her. 71 Gonzles and Hamily-Sinthy NHS, USA 2013, 2014 N = 719,203, her. 17, her. 18, her. 71, Ja, her.	N=5938, het.: 5,713, les.: 71, bi.: 154
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	N=85,739, het.: 83,729 les.: 771, bi.:1,239
Diamart and Wold** LACHS, CA, USA September 1999 to December 1999 N=4135, her.: $4/0.2$ Diamart and Wold** LACHS, CA, USA September 1997 to July 1997 N = 443, her.: $4/0.2$ Dible et al.** Single cross-sectional study, USA Single cross-sectional study, USA N = 443, her.: 473 Dible et al.** Single cross-sectional study, USA 1995–1997 N = 443, her.: 473 Dible et al.** Single cross-sectional study, USA 2003-2006 N = 446, her.: 473 Dible et al.** CALIS, CA, USA 2003, 2005, 2007, 2009 N = 446, her.: 473 Dible et al.* Washington BRFSS, USA 2003, 2005, 2007, 2009 N = 148, 655, her.: 475 Fredirksen-Goldsen et al.* NHS, USA 2013, 2014 N = 73, 106, 4her.: 475 Gonzales and Henning-Smith* BRFSS, states including SOM, USA 2013, 2014 N = 173, 206, her.: $77, 106, her.: 173, 106, her.: 71, 113, her.: 173, 105, her.: 71, 113, her.: 173, 106, her.: 71, 113, her.: 126, her.: 71, 113, her.: 126,$	N=311, het.: 161, les.: 150
Diamate et al. ⁵⁰ LACHS, CA, USA April 1977 to July 1977 N=4697, her:: 4610. Dibble et al. ²¹ Disple et al. ²¹ Single cross-sectional study, USA 1997-2002 N=381, her:: 728, les Dibble et al. ²¹ Single cross-sectional study, USA 1995-1997 N=6497, her:: 4610. Dibble et al. ²¹ Single cross-sectional study, USA 1995-1997 N=6497, her:: 4610. Dibble et al. ²¹ Washington BRFSs, USA 2003. 2005, 2007, 2009, 2011-2012 N=64957, her:: 471 Dibble stal. ²¹ Washington BRFSs, USA 2003, 2005, 2007, 2009, 2011-2012 N=60,542, her:: 97 Fredriksen-Goldsen et al. ²⁶ NHIS, USA 2013, 2014 2013, 2014 N=80,543, her:: 116 Gonzales and Henning-Smith ³⁸ BRFSS, tates including SOM, USA 2013, 2014 N=73,153, her:: 71, 33, her:: 71, 34 Gonzales and Henning-Smith ³⁸ NHIS, USA 2013-2016 N=179,203, her:: 11, N=179,203, her:: 11, N=110,54 Hurchcraft et al. ⁶⁰ NHIS, USA 2013-2016 N=179,203, her:: 13, N=179,203, her:: 13, N=171,433, her:: 13, N=179,203, her:: 13, N=171,434 Hurchcraft et al. ⁶⁰ NHIS, USA 2013-2016 N=14004, here:: 13, N=171,434 <td< td=""><td>9 N=4135, het.: 4,023, les.: 43, bi.: 69</td></td<>	9 N=4135, het.: 4,023, les.: 43, bi.: 69
Dible et al. ⁵¹ Single cross-sectional study, USA1995–2002N=381, her: 278, leDibble et al. ⁵¹ Dibble et al. ⁵² Single cross-sectional study, USA1995–197N=649, her: 478, leDibble et al. ⁵² Single cohort study, USA2003. 2005, 2007, 2009N=649, her: 478, leDiley et al. ⁵³ Washington BRFSS, USA2003, 2005, 2007, 2009N=649, her: 478, leDirey et al. ⁵³ Washington BRFSS, USA2003, 2005, 2007, 2009N=649, her: 498, leFredriksen-Goldsen et al. ⁵⁶ WHIS, USA2013, 2014N=699, 2011–2012N=649, her: 491, leGoo and Mansh ⁷⁷ NHIS, USA2013, 20142013, 2014N=8921, her: 371, leGoo zales and Hanning-Smith ⁹⁸ NHIS, USA2013, 2014N=19, leN=139, leGoo zales and Hanning-Smith ⁹⁸ NHIS, USA2013, 2014N=137, leN=139, leHur AndNHIS, USA2013, 20162013-2016N=130, leN=130, leGoo zales and Hanning-Smith ⁹⁸ NHIS, USA2013-2016N=130, leN=130, leHur AndNHIS, USA2013-2016N=13, leN=130, leN=130, leHur AndNHIS, USA2013-2016NHIS, USA2013-2016N=130, leHur AndNHIS, USA2013-2018NHIS, USA2013-2018N=130, leHur AndNHIS, USA2013-2018NHIS, USA2013-2018N=130, leHur AndNHIS, USA2013-2018NHIS, USA2013-2018N=14,004, her: 130, leHur AndNHIS, USA2013-2018NHIS, USA<	N = 4697, het.: 4610, les.: 51, bi.: 36
Dible et al. ³⁵ CHS, CA, USA 2003–2006 N = 649, her: 475, her: 476, here: 446, here: 446, here: 446, here: 446, here: 446, her	N=381 her · 278 les · 103
Dilloy et al. ³ Construction transformers Display term of the statistic mode at al. ³ Non-optimization of the statestic a	
Dulley et al. ⁻⁷ Dulley et al. ⁻⁷ Natingtion BKFS, USA 2003-2006 N=160542, her: 97 Dulley et al. ⁻⁷ CHIS, CA, USA 2003, 2005, 2007, 2009 N=160542, her: 97 Fredriksen-Goldsen et al. ⁵⁶ WHIS, USA 2013, 2014 N=180543, her: 97 Fredriksen-Goldsen et al. ⁵⁶ NHIS, USA 2013, 2014 N=1879,203, her: 137, 014 Gao and Mansh ⁻⁷ NHIS, USA 2013, 2014 N=1879,203, her: 137, 014 Gonzales and Henning-Smith ³⁰ BRFSS, states including SOM, USA 2013, 2016 N=179,203, her: 17, 015 Gonzales and Henning-Smith ³⁰ BRFSS, USA 2013, 2016 N=179,203 her: 17, 015 Gonzales and Zinone ³⁰ NHIS, USA 2013, 2016 N=179,203 her: 17, 015 Hutchcraft et al. ⁶⁰ NHIS, USA 2013-2018 N=14,004, her: 16, 0166 N=14,004, her: 16, 0166 Hutchcraft et al. ⁶⁰ NHIS, USA 2013-2018 N=14,004, her: 16, 005,666, her: 17, 016, 016, 016, 016, 016, 016, 016, 016	N = 043, flet.: 400, les.: 101
Eliason et al. ⁵⁴ CHS, CA, USA 2003, 2005, 2007, 2009, 2001, 2012 N = 100,542, her. 19, N = 19,921, her. 18, N = 18,921, and N = 18,920, and M = N = 18,00, Som, USA 2003, 2005, 2007, 2009 N = 18,921, her. 18, N = 17,3201 Gonzales and Haning-Smith ³⁶ NHIS, USA 2013, 2014 N = 17,9203, her. 17,13 Gonzales and Linone ³⁹ NHIS, USA 2013, 2016 N = 17,9203, her. 17,13 Han et al. ⁶⁰ NHIS, USA 2013, 2016 N = 17,9203, her. 17,13 Han et al. ⁶⁰ NHIS, USA 2013, 2016 N = 17,0206, her. 13,7 Han et al. ⁶⁰ NHIS, USA 2013, 2003 N = 17,03, her. 17,13 Hurchraft et al. ⁶⁰ NHIS, USA 2013, 2016 N = 17,04, her. 13,7 Hurchraft et al. ⁶⁰ NHIS, USA 2013, 2003 N = 17,064, her. 13,7 Marsh et al. ⁶⁰ NHIS, USA 2013, 2003 N = 11,066, her. 13,7 Marsh et al. ⁶⁰ NHIS, USA 2013, 2003 N = 11,00,548, her. 11,240, her. 14,00, her. 13,7 Marsh et al. ⁶⁰ NHIS, USA 2014, 2015 N	N = 48,655, het.: 47,505, les.: 589, bi.: 561
Fredriksen-Goldsen et al. ⁵⁵ Washington BRFS, USA 2003, 2005, 2007, 2009 $N = 50, 191, herr. 19, G$ Fredriksen-Goldsen et al. ⁵⁶ NHIS, USA 2013, 2014 $N = 50, 191, herr. 13, T$ Gao and Mansh ³⁷ NHIS, USA 2013, 2014 $N = 50, 191, herr. 13, T$ Gao and Henning-Smith ³⁶ NHIS, USA 2013, 2014 $N = 50, 191, herr. 13, T$ Gao and Henning-Smith ³⁶ NHIS, USA 2013, 2016 $N = 17, 203, herr. 11, T$ Gonzales and Henning-Smith ³⁶ NHIS, USA 2013, 2016 $N = 14, 004, herr. 13, T$ Han et al. ⁶⁰ NHIS, USA 2013-2016 $N = 14, 004, herr. 13, T$ Han et al. ⁶¹ NHIS, USA 2013-2018 $N = 10, 05, 68, herr. 10, R$ Hurchcraft et al. ⁶¹ NHIS, USA 2013-2018 $N = 11, 066, herr. 10, R$ Hurchcraft et al. ⁶¹ NHIS, USA 2013-2018 $N = 10, 06, herr. 10, R$ Mansh et al. (NHIS) ⁶⁵ NHIS, USA 2013-2018 $N = 10, 06, herr. 10, R$ Marsh et al. ⁶¹ NHIS, USA 2013-2018 $N = 10, 06, herr. 10, R$ Marsh et al. ⁶¹ NHIS, USA 2013-2018 $N = 10, 06, herrr. 1$	2 N= 100,542, het.: 97,720, SMW: 2822
Fredriken-Goldsen et al. ⁵⁶ NHIS, USA 2013, 2014 N= 18,921, het: 18,6 Gao and Mansh ⁷⁷ NHIS, USA 2013, 2014 N= 19,203, het: 137,1 Gao and Mansh ⁷⁷ NHIS, USA 2013, 2014 N= 19,203, het: 137,1 Gao and Mansh ⁷⁷ NHIS, USA 2013, 2016 N= 179,203, het: 137,1 Gonzales and Zinone ³⁹ NHIS, USA 2013–2016 N= 179,203, het: 13,7 Han et al. ⁶⁰ NHIS, USA 2013–2018 N= 173,153, het: 71,3 Hacticafie NHIS, USA 2013–2018 N= 14,004, het: 13,7 NHIS, USA NHIS, USA 2013–2018 N= 14,004, het: 13,7 NHIS, USA NHIS, USA 2013–2018 N= 14,004, het: 13,7 Nin and Fredriksen-Goldsen ⁶¹ NHIS, USA 2013–2018 N= 14,004, het: 10,6 Kim and Fredriksen-Goldsen ⁶³ Washington BKFSS, USA 2014–2015 N= 11,066, het: 10,6 Mansh et al. Washington BKFSS, USA 2014–2015 N= 136,878, het: 440,7 Mansh et al. Marthews and Lee ⁶⁶ NHIS, USA 2014–2015 N= 11,43, het: 69,1 Marthews and Lee ⁶⁶ NHIS,	N=50,191, het.: 49,029, les.: 626, bi.: 536
Gao and Mansh ⁵⁷ NHIS, USA 2013, 2014 N=38,063, her:: 17, 2015 N=179,203, her:: 17, 2015 N=179,004, her:: 13, 2016 N=179,004, her:: 13, 2016 N=179,005, her:: 10, 2014, her:: 10, 2013, 2018 N=110,056, her:: 10, 2013, 2013 N=110,056, her:: 10, 2013, 2016 N=110,056, her:: 10, 2013, 2005 N=110,066, her:: 10, 2013, 2005 N=110,056, her:: 10, 2013, 2005 N=111,066, her:: 10, 2013, 2005 N=110,056, her:: 143, her:: 450, her:: 450, her:: 440, 2013, 2013, 2005 N=110,056, her:: 142, 2	N= 18,921, het.: 18,669, SMW: 252
Gonzales and Henning-Smith ³⁸ BRFSS, states including SOM, USA 2014, 2015 N= 179, 203, het:: 17, 203, het:: 17, 2015 Gonzales and Zinone ⁵⁹ NHIS, USA 2013–2016 N= 73, 153, het:: 17, 2015 N= 73, 153, het:: 17, 2015, het:: 13, 2015 Han et al. ⁶⁰ NSDUH, USA 2013–2016 N= 14,004, het:: 13, 2013 N= 73, 153, het:: 17, 2015, het:: 13, 2013–2018 N= 14,004, het:: 13, 2013–2018 N= 11,066, het:: 10, 2013–2013 N= 13,6,878, het:: 14,306, ret:: 10, 2013–2013 N= 13,6,878, het:: 14,306, ret:: 10, 2013–2013 N= 13,6,878, het:: 14,206, ret:: 10, 2013–2013 N= 13,6,878, het:: 14,206, ret:: 10, 2013–2013 N= 13,6,878, het:: 14,206, ret:: 10, 2013–2014 N= 13,6,878, het:: 14,206, ret:: 10, 2013–2014 N= 13,6,878, het:: 14,206, ret:: 10,203, 2005 N= 13,6,878, het:: 14,206, ret:: 10,203, 2005 N= 13,6,878, het:: 14,206, ret	N=38,063, het.: 37,185, les.: 525, bi.: 353
Gonzales and Zinone ³ NHS, USA 2013–2016 N = 73,153, het:: 71,3 Han et al. ⁶⁰ NSDUH, USA 2013–2016 N = 14,004, het:: 13,7 Han et al. ⁶⁰ NSDUH, USA 2013–2018 N = 14,004, het:: 13,7 Hutchcraft et al. ⁶¹ NHIS, USA 2013–2018 N = 11,066, het:: 97 Hutchcraft et al. ⁶² NHIS, USA 2013–2018 N = 11,066, het:: 10,6 Kim and Fredriksen-Goldsen ⁶³ Washington BRFSS, USA 2003–2009 N = 14,607, het:: 13,7 Kim and Fredriksen-Goldsen ⁶³ Washington BRFSS, USA 2014–2015 N = 14,607, het:: 10,6 Mansh et al. (CHIS) ⁶⁵ NHIS, USA 2014–2015 N = 13,6,878, het:: 14,60, het:: 13,7 Mansh et al. (CHIS) ⁶⁵ NHIS, USA 2011–2015 N = 13,6,878, het:: 14,40, Marthews and Lee ⁶⁶ NHIS, USA 2011–2012 N = 18,457, het:: 14,40, Patterson and Jabson ⁶⁷ NHANES, USA 2011–2012 N = 445,469, het:: 44,60, Saunders et al. ⁶⁹ ESTHER, PA, USA 2011–2012 N = 445,469, het:: 44,60, Simenson et al. ⁶⁹ ESTHER, PA, USA 2011–2012 N = 445,469, het:: 44,60,	N = 179 203. het : 174 780. les : 1718. hi : 2705
Han et al. ⁶⁰ NSDU, USA 2015–2017 N=14,004, herr. 137 Han et al. ⁶⁰ NHS, USA 2013–2018 N=14,004, herr. 10,568, herr. 137 Hutchcraft et al. ⁶¹ NHS, USA 2013–2018 N=11,066, herr. 10,568, herr. 10,568 Kim and Fredriksen-Goldsen ⁶³ Washington BRFSS, USA 2013–2018 N=14,004, herr. 14506, herr. 10,568 Mansh et al. NHS, USA 2001, 2003, 2005 N=136, 878, herr. 1469, herr. 10,568 N=136, 878, herr. 14306, herr. 10,568 Mansh et al. (CHIS) ⁶⁵ NHIS, USA 2001, 2003, 2005 N=171,143, herr. 143, herr. 143, herr. 143, herr. 143, herr. 143, herr. 144, herr. 145, herr. 144, herr. 145, herr. 144,	N = 73 153 her 71 344 les 1079 hi 780
Train et al. Nacury Cost Subscription Heslin ⁶¹ NHIS, USA 2013–2018 N=10,05,68, het:: 19,7 Heslin ⁶¹ NHIS, USA 2013–2018 N=11,065, het:: 10,8 Hutchcraft et al. ⁶² NHIS, USA 2013–2018 N=11,065, het:: 10,8 Kim and Fredriksen-Goldsen ⁶³ Washington BRFSS, USA 2003–2009 N=14,07, het:: 14,50,6 Lew et al. ⁶⁴ NHIS, USA 2001, 2003, 2005 N=11,143, het:: 13,6,878, het:: 14,13, het:: 61,10,55 Mansh et al. (CHIS) ⁶⁵ NHIS, USA 2001, 2003, 2005 N=17,143, het:: 61,10,75 Mansh et al. (CHIS) ⁶⁵ NHIS, USA 2011–2015 N=14,40,75 Mansh et al. (CHIS) ⁶⁵ NHIS, USA 2011 2003, 2005 N=14,40,75 Matthews and Lee ⁶⁶ NOrth Carolina BRFSS, USA 2011 2013 2014 2013 Patterson and Jabson ⁶⁷ ORTHGR, USA 2011 2012 N=14,40,75 het:: 4440,75 Saunders et al. ⁶⁹ ESTHER, PA, USA 2011–2012 N=445,469, het:: 4440,75 N=445,469, het:: 4420,75 N=445,469, het:: 4420,75	NI-13,133,142,142,131,153,142,152,172,173,173,173,173
Heating Coll3-2018 NHIS, USA 2013-2018 N=100,566, het:: 10,6 Hutchcraft et al. ⁴² NHIS, USA 2013-2018 N=11,066, het:: 10,6 Kim and Fredriksen-Goldsen ⁶³ NHIS, USA 2013-2018 N=11,066, het:: 10,6 Lew et al. ⁴⁴ NHIS, USA 2003-2009 N=4607, het:: 4506, het:: 10,6 Mansh et al. BRFSS, USA 2001, 2003, 2005 N=11,046, het:: 10,8 Mansh et al. CHIS, CA, USA 2001, 2003, 2005 N=17,143, het:: 18,0 Mansh et al. (NHIS) ⁶⁵ NHIS, USA 2013 2001, 2003, 2005 N=16,144,0 Matthews and Lee ⁶⁶ North Carolina BRFSS, USA 2011 2012 N=1440, N=1440,0 Saunders et al. ⁶⁸ GPPS, UK 2011-2012 N=445,469, het:: 443,0 N=445,469, het:: 444,0 Saunders et al. ⁶⁸ ESTHER, PA, USA 2011-2012 N=445,469, het:: 443,469, het:: 444,0 N=445,469, het:: 444,0 Saunders et al. ⁶⁸ ESTHER, PA, USA 2011-2012 N=445,469, het:: 444,0 N=445,469, het:: 444,0 Saunders et al. ⁶⁹ ESTHER, PA, USA 2011-2012 N=445,469, het:: 444,0 N=445,469, he	N = 14,004, Net.: 13,706, Jes.: 173, DI.: 123
Hutchcraft et al. ⁶⁴ NHIS, USA 2013–2018 N = 11,066, het:: 10,6 Kim and Fredriksen-Goldsen ⁶³ Washington BRFSS, USA 2003–2009 N = 4607, het:: 4506, het:: 10,6 Lew et al. ⁶⁴ BRFSS, USA 2003–2009 N = 4607, het:: 4506, het:: 10,6 Mansh et al. (CHIS) ⁶⁵ Washington BRFSS, USA 2001, 2003, 2005 N = 13,6,878, het:: 4514 Mansh et al. (CHIS) ⁶⁵ NHIS, USA 2001, 2003, 2005 N = 71,143, het:: 481 Mansh et al. (NHIS) ⁶⁵ NHIS, USA 2011 2001, 2003, 2005 N = 71,143, het:: 481, het:: 481, het:: 481 Marsh et al. (NHIS) ⁶⁵ NHIS, USA 2011 2001, 2003, 2005 N = 71,143, het:: 481, het:: 440, 2013 Matthews and Lee ⁶⁶ NOrth Carolina BRFSS, USA 2011 2001, 2003, 2005 N = 7440, het:: 444, 2014 Patterson and Jabson ⁶⁷ NHANES, USA 2001-2014 N = 412,440, het:: 444, 2014, het:: 444, 2011 Saunders et al. ⁶⁸ ESTHER, PA, USA 2011-2012 N = 445,469, het:: 444, 2014, het:: 444, 2014, 2016 Sinneson et al. ⁶⁹ ESTHER, PA, USA 2011-2012 N = 412,400, het:: 444, 2014, 400, 400, 400, 400, 400, 400, 400,	N=100,568, het.: 77,909, SMVY: 2659
Kim and Fredriksen-Goldsen ⁶³ Washington BRFSS, USA 2003–2009 N = 4607, het.: 4506, het.: 4506, Lew et al. ⁶⁴ Lew et al. ⁶⁴ BRFSS, USA 2014–2015 N = 136,878, het.: 13 Mansh et al. (CHIS) ⁶⁵ CHIS, CA, USA 2001, 2003, 2005 N = 71,143, het.: 18,0 het.: 14,0 het.: 18,0 het.: 18,0 het.: 18,0 het.: 14,0 het.: 18,0 het.: 14,0 het.: 12,0 het.: 12,0 het.: 12,0 het.: 12,0 het.: 12,0 het.: 14,0 het.: 12,0 het.: 14,0	N=11,066, het.: 10,830, les.: 141, bi.: 95
Lew et al. ⁶⁴ BRFSS, USA 2014–2015 N = 136,878, het.: 13 Mansh et al. (CHIS) ⁶⁵ CHIS, CA, USA 2001, 2003, 2005 N = 71,143, het.: 16,143, het.: 18,0457, het.: 18,0456 Marsh et al. (NHIS) ⁶⁵ NHIS, USA 2011 2013 N = 18,457, het.: 18,0566 Matthews and Lee ⁶⁶ NOrth Carolina BRFSS, USA 2011 2011 N = 6110,0576 Patterson and Jabson ⁶⁷ NHANES, USA 2011–2012 N = 445,469, het.: 4440,0556 N = 445,469, het.: 4440,0566 Saunders et al. ⁶⁸ ESTHER, PA, USA 2011–2012 N = 445,469, het.: 446,0566 N = 445,469, het.: 446,0566 Saunders et al. ⁶⁹ ESTHER, PA, USA 2011–2012 N = 445,469, het.: 446,056 N = 445,469, het.: 446,056 Singer et al. ⁷⁰ BRFSS, USA 2011–2012 N = 445,469, het.: 446,056 N = 445,469, het.: 446,056 Singer et al. ⁷⁰ BRFSS, USA 2011–2012 N = 445,469, het.: 446,066 N = 445,469, het.: 446,067 Singer et al. ⁷⁰ BRFSS, USA 2011–2012 N = 445,469, het.: 446,067 N = 445,469, het.: 446,067 N = 44	N=4607, het.: 4506, les.: 41, bi.: 60
Mansh et al. (CHIS) ⁶⁵ CHIS, CA, USA 2001, 2003, 2005 N = 71,143, het.: 69,1 Mansh et al. (NHIS) ⁶⁵ NHIS, USA 2013 N = 18,457, het.: 18,0 Matthews and Lee ⁶⁶ NHIS, USA 2013 N = 18,457, het.: 18,0 Matthews and Lee ⁶⁶ North Carolina BRFSS, USA 2011 N = 6190, het.: 44,0 Patterson and Jabson ⁶⁷ NHANES, USA 2011 2014 N = 445, 469, het.: 44,0 Saunders et al. ⁶⁸ GPPS, UK 2011–2012 N = 445, 469, het.: 44,0 N = 445, 469, het.: 44,0 Simenson et al. ⁶⁹ ESTHER, PA, USA 2011–2012 N = 445, 469, het.: 44,0 N = 445, 469, het.: 44,0 Simenson et al. ⁶⁹ ESTHER, PA, USA 2011–2012 N = 445, 469, het.: 44,0 N = 472, 410,0 Simenson et al. ⁶⁹ ESTHER, PA, USA 2011–2012 N = 499,717, het.: 48,0 N = 421,416,0 Simenson et al. ⁷⁰ ESTHER, PA, USA 2014–2018 N = 472,116,0 N = 479,717, het.: 48,0	N= I 36,878, het.: I 33,546, les.: I 387, bi.: I 945
Mansh et al. (NHIS) ⁶⁵ NHIS, USA 2013 N = 18,457, het.: 18,0 Matthews and Lee ⁶⁶ North Carolina BRFSS, USA 2011 N = 6196, het.: 6110,0 Patterson and Jabson ⁶⁷ North Carolina BRFSS, USA 2011 N = 4728, het.: 440,0 Patterson and Jabson ⁶⁷ NHANES, USA 2009–2014 N = 4728, het.: 440,0 Saunders et al. ⁶⁸ GPPS, UK 2011–2012 N = 445,469, het.: 446,0 Simeson et al. ⁶⁹ ESTHER, PA, USA 2015–2016 N = 483, het.: 213, le Singer et al. ⁷⁰ BRFSS, USA 2014–2018 N = 499,717, het.: 48	N=71,143, het.: 69,109, SMW: 2034
Matthews and Lee ⁶⁶ North Carolina BRFSS, USA 2011 N = 6196, het: 6110, Patterson and Jabson ⁶⁷ NHANES, USA 2009–2014 N = 4728, het: 440, Patterson and Jabson ⁶⁷ NHANES, USA 2009–2014 N = 4728, het: 440, Saunders et al. ⁶⁸ GPPS, UK 2011–2012 N = 445,469, het: 44 Simenson et al. ⁶⁹ ESTHER, PA, USA 2015–2016 N = 483, het: 213, le Singer et al. ⁷⁰ BRFSS, USA 2014–2018 N = 499,717, het: 48 Singer et al. ⁷¹ ESTHER PA LISA Annit 7008 Fro Annuer 2008 N = 211 het: 47	N= 18,457, het.: 18,051, SMW: 406
Patterson and Jabson ⁶⁷ NHANES, USA 2009–2014 N = 4728, het:: 4440. Saunders et al. ⁶⁸ GPPS, UK 2011–2012 N = 445,469, het:: 446. Simenson et al. ⁶⁹ ESTHER, PA, USA 2015–2016 N = 483, het:: 448. Singer et al. ⁷⁰ BRFSS, USA 2014–2018 N = 499,717, het:: 48 Singer et al. ⁷⁰ ESTHER, PA, USA 2014–2018 N = 499,717, het:: 48	N = 6196, het.: 6110, SMW: 86
Saunders et al. ⁶⁰ GPPS, UK 2011–2012 N=445,469, het.: 44 Simenson et al. ⁶⁹ ESTHER, PA, USA 2015–2016 N=483, het.: 213, le Singer et al. ⁷⁰ BRFSS, USA 2014–2018 N=499,717, het.: 48 Contribute of al. ⁷¹ ESTHER på 115a Anni 2008 for Annurer 2008 N=211 het.: 47	N=4728. het.: 4440. les.: 63. bj.: 225
Summary of the state of the	N = 445 469 het · 440 698 les · 7759 hi · 2012
2013–2019 2013–2019 2013–2019 2013–2019 2013–2019 2013–2019 2013–2019 2013–2019 2013–2019 2014–2018 2014 2014 2014 2014 2014 2014 2014 2014	
کال 14–2013 مارند 14–2015 مارند 14–2015 N = 473,/11, netr. 15 5 Smith at a1 ⁷¹ FSTHER PA IISA محمداً 2008 مارند 2008 N=211 hat 97 las	N - 403, Net.: 213, Ies.: 270 N- 400 717 404 24 1700 -:- 0777
Smith at al /l ESTHER PA 11SA Ancil 2008 to Aniguist 2008	N = 477,/1/, het.: 484,341, les.: 5607, bl.: 7/6/
	N=211, het.: 97, les.: 114
Strutz et al. ⁷² Add Health, USA 2008 N=5815, het.: 5378,	N=5815, het.: 5378, SMW: 437
Villiams et al. ⁷³ NHIS, USA 2013–2017 N=58,230, het.: 57,2	N=58,230, het.: 57,216, les.: 723, bi.: 291
Zaritsky and Dibble ⁷⁴ Single cross-sectional study 1999–2002 N=84, het.: 42, les.:	N=84, het.: 42, les.: 42
(surber of Dibble 2004) USA	

Table 2. Study overview: included studies were study source, dates of data collection, and total sample size.

het: heterosexual; les: lesbian; bi: bisexual; CHIS: California Health Interview Survey; BFRSS: Behavioral Risk Factor Surveillance System; NHANES: National Health and Nutrition Examination Survey; ALSWH: Australian Longitudinal Study of Adolescent to Adult Health; LACHS: Los Angeles County Health Survey; NHIS: National Health Interview Survey; NSDUH: National Survey on Drug Use and Health; CAPS: General Practice Patient Survey; ESTHER: Epidemiologic STudy of Health Risk in Women; SOM: Sexual Orientation Module.

that reported data on cisgender and transgender individuals separately.⁴⁷ However, a considerable number of the included studies discussed not having information on gender identity as a limitation.^{28,36,39,41,49,53,58–61,66,73} In most cases, this was because publicly available data from the statewide or regional health surveys did not include information on gender identity (assessment).

The 44 included studies contained a total of 369 relevant comparisons (236 ORs + 133 AORs) on 21 different health outcomes assigned to these 12 different main categories (GBD): cardiovascular diseases, chronic respiratory diseases, diabetes and chronic kidney diseases, digestive diseases, maternal and neonatal diseases, musculoskeletal disorders, neoplasms, neurological disorders, nutritional deficiencies, other infectious diseases, other non-communicable diseases, and skin diseases (see Supplementary Table S2 for counts of ORs and AORs per category).

We excluded some data on arthritis,47 asthma,47 cancer,^{40,47,56,58,75} chronic obstructive pulmonary disease (COPD) and other chronic respiratory conditions,⁴⁷ CVD,⁷⁶ diabetes, 40, 47, 75 hypertension,^{40,75} miscarriage,⁷⁴ stroke40,75 since none of the above-mentioned criteria for retaining comparisons ((1)-(4), section "Methods") applied to them. The predetermined threshold to perform meta-analysis (≥ 2 non-overlapping weighted studies on the same health condition) was met for eleven health conditions (in order of appearance): heart attacks,^{47,55,67} hyper-tension,^{13,31,37,38,54,60,66,72,73} stroke,^{47,73} asthma,^{37,38,43,54–56,58,} ^{60,66,67} chronic kidney diseases, ^{47,60} diabetes, ^{31,37,38,43,46,52,53}, 60,64,66,73 arthritis, 13,28,37,56,58,67 back pain, 9,56 cancer, 28,38,45, ^{59,60,67,68,70} headache disorders,^{9,72} and hepatitis.^{36,38,60} We did not run meta-analyses, but report results narratively on the combined categories other or one out of multiple cardiovascular^{13,31,37,43,58,69} and chronic respiratory diseases^{49,58,60,67,72} since these categories summarize conditions with different pathologies that were not considered similar enough to be combined in a meta-analysis.

Findings on health conditions (alphabetical order)

Results of meta-analyses with significant results are shown in Figures 2–9. Meta-analyses without significant differences are provided in Supplementary Figures S1–S3. All results including those of unweighted studies that were not included in meta-analyses are displayed in Table 3.

Cardiovascular diseases

In terms of heart attacks, meta-analysis (Figure 2) across the subgroups found no significant overall difference of prevalence by sexual identity (OR = 0.64 (95% confidence interval (CI)=0.32-1.28), p=0.21, $I^2=73\%$). However, the test for subgroup differences reached significance, since on the subgroup level, significant differences were found in both meta-analyses for lesbian and bisexual women separately: lesbian women were approximately 40% (OR=0.42 (95% CI=0.23-0.77), p=0.005, $I^2=0\%$) and bisexual women about 50% (OR=0.48 (95% CI=0.31-0.75), p=0.001, $I^2=0\%$) less likely to have suffered a heart attack than heterosexual women. In contrast, the one study that combined lesbian and bisexual women (SMW) did not find a significant difference (OR=1.51 (95% CI=0.90-2.52), p=0.12, one study only). This study included only older adults ≥ 50 years, and after adjusting for demographic variables, SMW here were

	sexual minority	women	heterosexual	women		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
1.9.1 lesbian women						and brick block however, but which and	
Dai & Hao, 2017	10	771	2596	83729	26.9%	0.41 [0.22, 0.77]	
Patterson & Jabson, 2018 Subtotal (95% CI)	0	63 834	53	4440 88169	5.3% 32.1%	0.65 [0.04, 10.57] 0.42 [0.23, 0.77]	•
Fotal events	10		2649				
Heterogeneity: Tau ² = 0.00; Chi ²	= 0.10, df = 1 (P =	0.76); I ² :	= 0%				
Test for overall effect: $Z = 2.79$ (F	P = 0.005)						
1.9.2 bisexual women							
Dai & Hao, 2017	19	1239	2596	83729	29.9%	0.49 [0.31, 0.77]	
Patterson & Jabson, 2018	1	225	53	4440	9.1%	0.37 [0.05, 2.68]	· · · · · · · · · · · · · · · · · · ·
Subtotal (95% CI)		1464		88169	39.0%	0.48 [0.31, 0.75]	◆
Fotal events	20		2649				
Heterogeneity: Tau ² = 0.00; Chi ² Fest for overall effect: Z = 3.24 (P	= 0.07, df = 1 (P = P = 0.001)	0.79); l ² :	= 0%				
1.9.3 sexual minority women (le	esbian and bisexua	ls aggreg	gated)				
Fredriksen-Goldsen et al., 2017	16	252	803	18669	28.9%	1.51 [0.90, 2.52]	
Subtotal (95% CI)		252		18669	28.9%	1.51 [0.90, 2.52]	
Fotal events	16		803				
Heterogeneity: Not applicable							
Test for overall effect: $Z = 1.58$ (P	P = 0.12)						
Total (95% CI)		2550		195007	100.0%	0.64 [0.32, 1.28]	
Fotal events	46		6101				
Heterogeneity: $Tau^2 = 0.37$; Chi ²	= 14.97, df = 4 (P	= 0.005);	$l^2 = 73\%$				
Test for overall effect: Z = 1.26 (F	P = 0.21						0.05 0.2 1 5 20
							Favours (sexual minority) Favours (heterosexual)

Figure 2. Forest plot: meta-analysis on heart attacks. M.-H.: Mantel–Haenszel, Cl: confidence interval.

	sexual minority	women	heterosexua	l women		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
1.4.1 lesbian women							
Garland–Forshee et al., 2014	79	347	6554	25602	9.6%	0.86 [0.67, 1.10]	
Han et al., 2020	51	173	4990	13708	7.5%	0.73 [0.53, 1.01]	
McNair et al., 2011	2	63	449	7959	0.7%	0.55 [0.13, 2.25]	
Williams et al., 2020	263	723	26491	57216	12.9%	0.66 [0.57, 0.77]	.
Subtotal (95% CI)		1306		104485	30.7%	0.71 [0.63, 0.81]	◆
Total events	395		38484				
Heterogeneity: Tau ² = 0.00; Chi ²	= 3.05, df = 3 (P	= 0.38); I ² =	= 2%				
Test for overall effect: $Z = 5.37$ (F	<i>e</i> < 0.00001)						
1.4.2 bisexual women							
Garland-Forshee et al., 2014	40	322	6554	25602	7.4%	0.41 [0.30, 0.57]	
Han et al., 2020	33	123	4990	13708	6.0%	0.64 [0.43, 0.96]	
McNair et al., 2011	1	100	449	7959	0.4%	0.17 [0.02, 1.21]	
Williams et al., 2020	115	291	26491	57216	10.1%	0.76 [0.60, 0.96]	
Subtotal (95% CI)		836		104485	23.9%	0.56 [0.38, 0.83]	•
Total events	189		38484				
Heterogeneity: $Tau^2 = 0.10$; Chi^2	= 10.49, df = 3 (F	$I = 0.01$; I^2	= 71%				
Test for overall effect: $Z = 2.88$ (F	P = 0.004)						
1.4.3 sexual minority women (le	sbian and bisexu	ial aggrega	ited)				
Caceres et al., 2018	24	346	601	7157	5.6%	0.81 [0.53, 1.24]	
Eliason et al., 2017	516	2822	19935	97720	14.6%	0.87 [0.79, 0.96]	-
Fredriksen-Goldsen et al., 2013	307	853	24900	57466	13.3%	0.74 [0.64, 0.85]	+
Matthews & Lee, 2014	24	86	2526	6110	4.8%	0.55 [0.34, 0.88]	
Strutz et al., 2015	38	437	463	5378	7.1%	1.01 [0.72, 1.43]	
Subtotal (95% CI)		4544		173831	45.3%	0.81 [0.70, 0.93]	•
Total events	909		48425				
Heterogeneity: $Tau^2 = 0.01$; Chi^2	= 8.04, df = 4 (P	= 0.09); I ² =	= 50%				
Test for overall effect: $Z = 2.97$ (F	9 = 0.003)						
Total (95% CI)		6686		382801	100.0%	0.72 [0.64, 0.82]	◆
Total events	1493		125393				
Hotorogonaity: $T_{2}u^{2} = 0.02$; Chi ²	= 32.74, df = 12	(P = 0.001)	$I^2 = 63\%$			-	
neterogeneity. rau = 0.02. Chi			10000 CONTRACTOR				
Test for overall effect: $Z = 5.12$ (F	P < 0.00001						0.05 0.2 I 5 20

Figure 3. Forest plot: meta-analysis on hypertension. M.-H.: Mantel–Haenszel, CI: confidence interval.

	sexual minority	women	heterosexual	women		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
1.1.1 lesbian women							
Blosnich et al., 2014	137	615	7901	51639	7.3%	1.59 [1.31, 1.92]	
redriksen-Goldsen et al., 2012	125	626	8104	49029	7.3%	1.26 [1.03, 1.53]	
Garland-Forshee et al., 2014	53	347	3098	25602	6.1%	1.31 [0.98, 1.76]	
onzales & Henning-Smith, 2017	266	1718	20274	174780	8.0%	1.40 [1.22, 1.59]	
an et al., 2020	26	173	1330	13708	4.7%	1.65 [1.08, 2.51]	
lcNair et al., 2011	5	63	781	7959	1.7%	0.79 [0.32, 1.98]	
atterson & Jabson, 2018	27	63	755	4440	3.9%	3.66 [2.21, 6.07]	
ubtotal (95% CI)		3605		327157	38.9%	1.51 [1.26, 1.81]	•
otal events	639		42243				
eterogeneity: Tau ² = 0.03; Chi ² =	18.50, df = 6 (P =	= 0.005); I ²	= 68%				
est for overall effect: Z = 4.42 (P <	< 0.00001)						
1.2 bisexual women							
osnich et al., 2014	119	451	7901	51639	7.1%	1.98 [1.61, 2.45]	
redriksen-Goldsen et al., 2012	171	536	8104	49029	7.4%	2.37 [1.97, 2.84]	
arland-Forshee et al. 2014	82	322	3098	25602	6.6%	2.48 [1.93, 3.20]	
onzales & Henning-Smith 2017	641	2705	20274	174780	8 3%	2 37 [2 16 2 59]	-
an et al., 2020	16	123	1330	13708	3.7%	1.39 [0.82, 2.36]	
cNair et al 2011	18	100	781	7959	3.8%	2 02 [1 20 3 38]	
atterson & Jabson 2018	71	225	755	4440	6.1%	2 25 [1 68 3 01]	
ubtotal (95% CI)	71	4462	, 55	327157	43.1%	2.28 [2.11, 2.47]	•
otal events	1118		42243				
eterogeneity: $Tau^2 = 0.00$; $Chi^2 =$	6.46, df = 6 (P = (0.00001)	0.37); I ² =	7%				
est for overall effect. $Z = 20.91$ (P	< 0.00001)						
1.3 sexual minority women (lesl	bian and bisexua	ls aggrega	ted)				
iason et al., 2017	621	2822	13681	97720	8.3%	1.73 [1.58, 1.90]	
edriksen-Goldsen et al., 2017	45	252	2558	18669	5.7%	1.37 [0.99, 1.90]	
latthews & Lee, 2014	21	86	865	6110	4.0%	1.96 [1.19, 3.22]	
ibtotal (95% CI)		3160		122499	18.0%	1.70 [1.52, 1.90]	•
otal events	687		17104				
eterogeneity: Tau ² = 0.00; Chi ² =	2.17, df = 2 (P =	0.34 ; $I^2 =$	8%				
est for overall effect: Z = 9.25 (P <	< 0.00001)						
otal (95% CI)		11227		776813	100.0%	1.80 [1.57, 2.06]	•
otal events	2444		101590				10 m
eterogeneity: $Tau^2 = 0.05$: $Chi^2 =$	100.54, df = 16 (P < 0.0000	(1): $l^2 = 84\%$				
est for overall effect: $Z = 8.54$ (P <	< 0.00001)		-,,. 0.,0				0.2 0.5 1 2 5
	20.05 10 24		1) 12 00 000				Favours sexual minority Favours heterosexuals

Figure 4. Forest plot: meta-analysis on asthma. M.-H.: Mantel–Haenszel, CI: confidence interval.

	sexual minority	women h	neterosexual	women		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
1.3.1 lesbian women							
Blosnich et al., 2014	42	615	5267	51639	7.0%	0.65 [0.47, 0.88]	
Clark et al., 2015	3	71	395	5713	1.6%	0.59 [0.19, 1.90]	
Dilley et al., 2010	30	589	2990	47458	6.4%	0.80 [0.55, 1.15]	
Garland-Forshee et al., 2014	37	347	1664	25602	6.6%	1.72 [1.22, 2.42]	
Han et al., 2020	31	173	2317	13708	6.1%	1.07 [0.73, 1.59]	
Lew et al., 2018	108	1387	13755	133546	8.4%	0.74 [0.60, 0.90]	
McNair et al., 2011	1	63	53	7959	0.6%	2.41 [0.33, 17.67]	
Williams et al., 2020	110	723	9551	57216	8.3%	0.90 [0.73, 1.10]	
Subtotal (95% CI)		3968		342841	45.0%	0.91 [0.72, 1.15]	•
Total events	362		35992				
Heterogeneity: Tau ² = 0.07; Cł	$hi^2 = 24.26, df = 7$	(P = 0.001)	$; I^2 = 71\%$				
Test for overall effect: $Z = 0.78$	8 (P = 0.44)						
1.3.2 bisexual women							
3losnich et al., 2014	28	451	5267	51639	6.2%	0.58 [0.40, 0.86]	———
Clark et al., 2015	12	154	395	5713	4.1%	1.14 [0.63, 2.07]	
Dilley et al., 2010	33	561	2990	47458	6.5%	0.93 [0.65, 1.32]	_ _
Garland-Forshee et al., 2014	8	322	1664	25602	3.4%	0.37 [0.18, 0.74]	
Han et al., 2020	13	123	2317	13708	4.3%	0.58 [0.33, 1.03]	
Lew et al., 2018	123	1945	13755	133546	8.5%	0.59 [0.49, 0.71]	-
McNair et al., 2011	2	100	53	7959	1.1%	3.04 [0.73, 12.67]	· · · ·
Williams et al., 2020	43	291	9551	57216	6.9%	0.87 [0.63, 1.20]	
Subtotal (95% CI)		3947		342841	41.0%	0.72 [0.56, 0.93]	•
Total events	262		35992				
Heterogeneity: Tau ² = 0.07; Cł	ni ² = 18.72, df = 7	(P = 0.009)	$I^2 = 63\%$				
Test for overall effect: $Z = 2.55$	5 (P = 0.01)						
1.3.3 sexual minority women	(lesbian and bise	xual aggree	gated)				
Caceres et al., 2018	9	346	293	7157	3.6%	0.63 [0.32, 1.23]	
Eliason et al., 2017	82	2822	4691	97720	8.1%	0.59 [0.48, 0.74]	
Matthews & Lee, 2014	5	86	816	6110	2.4%	0.40 [0.16, 0.99]	
Subtotal (95% CI)		3254		110987	14.0%	0.58 [0.48, 0.72]	◆
Total events	96		5800				
Heterogeneity: Tau ² = 0.00; Cł	$ni^2 = 0.73, df = 2$	$P = 0.70$; I^2	^e = 0%				
Test for overall effect: $Z = 5.13$	8 (P < 0.00001)						
Гotal (95% СІ)		11169		796669	100.0%	0.77 [0.66, 0.91]	•
Total events	720		77784				
Heterogeneity: Tau ² = 0.07; Cł	$ni^2 = 58.89, df = 1$	8 (P < 0.000	$(001); I^2 = 699$	6			
Test for overall effect: $Z = 3.12$	P = 0.002						U.I U.Z U.S I Z S IO
Task for sub-second differences	Ch:2 7 C2 45	2 (0 0 0 0 0 0	12 72 00/				ravours sexual minority ravours neterosexuals

Figure 5. Forest plot: meta-analysis on diabetes. M.-H.: Mantel–Haenszel, CI: confidence interval.

	sexual minority	women	heterosexual	women		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
1.5.1 lesbian women							
Cochran & Mays, 2007 Subtotal (95% CI)	11	48 48	152	1058 1058	10.4% 10.4%	1.77 [0.88, 3.55] 1.77 [0.88, 3.55]	
Total events Heterogeneity: Not applicable Test for overall effect: Z = 1.61 (F	11 P = 0.11)		152				
1.5.2 bisexual women							
Cochran & Mays, 2007 Subtotal (95% CI)	10	38 38	152	1058 1058	9.1% 9.1%	2.13 [1.01, 4.47] 2.13 [1.01, 4.47]	
Total events Heterogeneity: Not applicable Test for overall effect: Z = 2.00 (F	10 P = 0.05)		152				
1.5.3 sexual minority women (le	sbian and bisexu	al aggrega	ted)				
Fredriksen–Goldsen et al., 2017 Subtotal (95% CI)	134	252 252	7430	18669 18669	80.6% 80.6%	1.72 [1.34, 2.20] 1.72 [1.34, 2.20]	
Total events Heterogeneity: Not applicable Test for overall effect: Z = 4.26 (F	134 P < 0.0001)		7430				
Total (95% CI)		338		20785	100.0%	1.76 [1.41, 2.20]	•
Total events Heterogeneity: Tau ² = 0.00; Chi ² Test for overall effect: Z = 4.94 (F Test for subgroup differences: Ch	155 = 0.29, df = 2 (P = P < 0.00001) $ij^2 = 0.29$, df = 2 (F	0.87); I ² =	7734 = 0%			_	0.2 0.5 1 2 5 Favours [sexual minority Favours [heterosexual]

Figure 6. Forest plot: meta-analysis on back pain. M.-H.: Mantel–Haenszel, CI: confidence interval.

	sexual minority	women	heterosexua	al women		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
1.2.1 lesbian women							
Boehmer et al., 2014	102	1265	7285	90608	9.2%	1.00 [0.82, 1.23]	+
Gonzales & Zinone, 2018	92	1029	6849	71344	9.1%	0.92 [0.75, 1.15]	
Han et al., 2020	23	173	1714	13708	6.0%	1.07 [0.69, 1.67]	
McNair et al., 2011	2	63	84	7959	1.2%	3.07 [0.74, 12.78]	
Patterson & Jabson, 2018	2	63	320	4440	1.2%	0.42 [0.10, 1.73]	
Saunders et al., 2017	76	2759	15982	440698	8.9%	0.75 [0.60, 0.95]	
Singer et al., 2020	426	5609	41653	484341	10.3%	0.87 [0.79, 0.96]	-
Subtotal (95% CI)		10961		1113098	45.9%	0.90 [0.80, 1.00]	•
Total events	723		73887				
Heterogeneity: Tau ² = 0.03	1; Chi ² = 8.33, df =	6 (P = 0.2)	22); $I^2 = 28\%$				
Test for overall effect: Z =	1.89 (P = 0.06)						
1.2.2 bisexual women							
Boehmer et al., 2014	90	1369	7285	90608	9.1%	0.80 [0.65, 1.00]	
Gonzales & Zinone, 2018	56	780	6849	71344	8.3%	0.73 [0.55, 0.96]	
Han et al., 2020	17	123	1714	13708	5.2%	1.12 [0.67, 1.88]	
McNair et al., 2011	1	100	84	7959	0.6%	0.95 [0.13, 6.87]	
Patterson & Jabson, 2018	13	225	320	4440	4.7%	0.79 [0.45, 1.40]	
Saunders et al., 2017	36	2012	15982	440698	7.5%	0.48 [0.35, 0.67]	
Singer et al., 2020	498	9767	41653	484341	10.4%	0.57 [0.52, 0.63]	T
Subtotal (95% CI)		14376		1113098	45.7%	0.69 [0.56, 0.84]	•
Total events	711		73887				
Heterogeneity: $Tau^2 = 0.04$	4; Chi ² = 18.32, df	= 6 (P = 0)	$(.005); I^2 = 67$	%			
Test for overall effect: Z =	3.62 (P = 0.0003)						
1.2.3 sexual minority wor	men (lesbian and b	isexual a	ggregated)				
Brown et al., 2015	87	251	3131	10200	8.4%	1.20 [0.92, 1.56]	+
Subtotal (95% CI)		251		10200	8.4%	1.20 [0.92, 1.56]	◆
Total events	87		3131				
Heterogeneity: Not applica	ble						
Test for overall effect: Z =	1.34 (P = 0.18)						
Total (95% CI)		25588		2236396	100.0%	0.83 [0.70, 0.98]	•
Total events	1521		150905				
Heterogeneity: $Tau^2 = 0.03$	7; Chi ² = 84.75, df	= 14 (P <	0.00001); I ² =	= 83%			
Test for overall effect: Z =	2.24 (P = 0.02)						U.I U.Z U.S I Z S I
Test for subgroup differen	cos: Chi ² - 11 02	IF _ 2 (D _	0.004) 12	01 00/			ravours sexual minority ravours neterosexuals

Figure 7. Forest plot: meta-analysis on cancer. M.-H.: Mantel–Haenszel, CI: confidence interval.



Figure 8. Forest plot: meta-analysis on headache disorders. M.-H.: Mantel–Haenszel, CI: confidence interval.

found to be more than twice as likely to have had a heart attack compared to heterosexual women.⁵⁶ Heterogeneity was higher in meta-analysis across subgroups than within subgroups.

Meta-analysis on hypertension (Figure 3) across all subgroups showed that lesbian, bisexual, and SMW were approximately 25% less likely to have hypertension than their heterosexual counterparts (OR=0.72 (95% CI=0.64– 0.82), p < 0.00001, $I^2=63\%$). The test for subgroup differences was not significant ($\chi^2=3.66$, degree of freedom (df)=2, p=0.16), since prevalence differences were found in all meta-analyses within subgroups: lesbian

se	xual minority v	vomen	heterosexual	women		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
1.7.1 lesbian women							
Han et al., 2020	4	173	192	13708	21.4%	1.67 [0.61, 4.54]	
McNair et al., 2011	0	63	16	7959	6.0%	3.79 [0.22, 63.87]	
Subtotal (95% CI)		236		21667	27.4%	1.83 [0.71, 4.69]	
Total events	4		208				
Heterogeneity: Tau ² = 0.00	$0; Chi^2 = 0.29,$	df = 1 (P =	$= 0.59$; $I^2 = 0$ %	6			
Test for overall effect: Z =	1.25 (P = 0.21)						
1.7.2 bisexual women							
Han et al., 2020	6	123	192	13708	24.1%	3.61 [1.57, 8.30]	
McNair et al., 2011	4	100	16	7959	19.7%	20.68 [6.79, 63.02]	
Subtotal (95% CI)		223		21667	43.8%	8.32 [1.42, 48.76]	
Total events	10		208				
Heterogeneity: $Tau^2 = 1.33$	$3: Chi^2 = 6.48$	df = 1 (P =	0.01 ; $l^2 = 85$	%			
Test for overall effect: Z =	2.35 (P = 0.02)						
1.7.3 sexual minority wo	nen (lesbian a	nd bisexua	als aggregate	d)			
Operario et al., 2015	17	377	65	5450	28.8%	3.91 [2.27, 6.74]	
Subtotal (95% CI)		377		5450	28.8%	3.91 [2.27, 6.74]	•
Total events	17		65				
Heterogeneity: Not applica	ble						
Test for overall effect: Z =	4.91 (P < 0.000	001)					
Total (95% CI)		836		48784	100.0%	4.43 [2.06, 9.52]	•
Total events	31		481				
	$5 \cdot Chi^2 = 11.82$	df = 4 (P	$= 0.02$; $I^2 = 6$	6%			
Heterogeneity: $Tau^2 = 0.4$, 11.01						
Heterogeneity: Tau ² = 0.4 Test for overall effect: Z =	3.81 (P = 0.000)	01)					Favours [sexual minority] Favours [heterosoyual]

Figure 9. Forest plot: meta-analysis on hepatitis. M.-H.: Mantel–Haenszel, CI: confidence interval.

women were about 30% (OR=0.71 (95% CI=0.63–0.81), p < 0.00001, $I^2=2\%$), bisexual women about 45% (OR=0.56 (95% CI=0.38–0.83), p=0.004, $I^2=71\%$), and SMW about 20% (OR=0.81 (95% CI=0.70–0.93), p < 0.003, $I^2=50\%$) less likely to have hypertension than heterosexual women. However, one notable result was found in one study that distinguished between hypertension *during* pregnancy and hypertension *other than* pregnancy (aggregated in meta-analysis): regarding hypertension *other than* pregnancy, lesbian women had (nonsignificantly) higher prevalence ratios than heterosexual women (Table 3).³⁸ Again, heterogeneity was higher in meta-analysis across subgroups than within subgroups, except for meta-analysis on SMW.

Concerning strokes, meta-analysis (Supplementary Figure S1) across the subgroups found no significant overall difference (OR=1.10 (95% CI=0.92–1.32), p=0.31, $l^2=0\%$). This also applied for both meta-analyses on lesbian and bisexual women separately. However, similar to heart attacks, one study (of only older adults \geq 50 years) found SMW to be more than twice as likely to suffer a stroke after adjusting for demographic variables.⁵⁶ Heterogeneity was $l^2=0\%$ in meta-analyses on stroke.

Chronic respiratory diseases

Of all conditions included in the systematic review, the most significant differences in prevalence were found for asthma: meta-analysis (Figure 4) revealed a significant overall effect, indicating that across the subgroups, lesbian, bisexual, and SMW were 80% more likely to suffer from asthma than heterosexual women (1.80 (95% CI=1.57–2.06), p < 0.00001, $I^2 = 84\%$). These differences were the largest

for bisexual women, who were significantly more than twice as likely to suffer from asthma than heterosexual women (2.28 (95% CI=2.11–2.47), p < 0.00001, $I^2 = 7\%$). Lesbian women were more than 1.5 times as likely to have asthma compared to heterosexual women (1.51 (95% CI=1.26-1.81), p=0.005, $l^2=68\%$). SMW aggregated were about 70% more likely to have asthma than heterosexual women (1.70 (95% CI=1.52–1.90), p < 0.00001, $I^2 = 68\%$). The test for subgroup differences reached significance $(\chi^2 = 28.65, df = 2, p < 0.00001)$, and overall, heterogeneity was higher in meta-analysis across subgroups than within subgroups. Regarding chronic obstructive pulmonary disease (COPD), the results were less distinctive: one significant AOR indicated a two times higher prevalence in lesbian women⁶² and the other comparisons revealed no significant differences in either direction.56,69,73

In those studies (n=5) that assessed other or one out of multiple chronic respiratory diseases, results, again, were very consistent: of a total of 18 ratios (ORs and AORs summed), only one AOR was non-significantly lower in lesbian women.⁴⁹ All other ratios were >1, with half of them (n=9) indicating significantly higher odds of chronic respiratory conditions (COPD and others⁵⁸; bronchitis/ COPD⁶⁰; chronic bronchitis⁶⁷; asthma/chronic bronchitis/ emphysema⁷²) in lesbian, bisexual, or SMW compared to heterosexual women.

Diabetes and chronic kidney diseases

Meta-analysis on chronic kidney diseases (Supplementary Figure S2) found no significant difference by sexual identity (OR=0.86 (95% CI=0.67–1.12), p=0.27, $l^2=0\%$).

Cardiovascular Heart at diseases ischemic (meta-ana disease (meta-ana	ttack (GBD: c heart disease) alysis: Figure 2) alysis: Figure 3)			ADR (95% CN	ADR (95% CI)	OR (95% CI) AOR (95% CI)
diseases ischemic (meta-ana disease (meta-ana	alysis: Figure 2) alysis: Figure 2) ensive heart alysis: Figure 3)	Dai and Hao ⁴⁷	Het: 3 I	↓ 0.41 (0.22–0.77)	↓ 0.49 (0.31–0.77)	
(meta-ana Hyperte disease (meta-ana	alysis: Figure 2) :nsive heart alysis: Figure 3)	*Heart attack ^{la}	Les: I.3 Bi: I.5			
Hyperte disease (meta-ana	:nsive heart alysis: Figure 3)	Patterson and Jabson ⁶⁷	Het: 1.2 Les: 0	\rightarrow	↓ 0.37 (0.05–2.68)	↓ 0.29 (0.04–2.09)
Hyperte disease (meta-ana	:nsive heart alysis: Figure 3)	*Heart attack ^{la}	Bi: 0.5 SMW: 0.4			↓ 0.55 (0.10–2.86)
Hyperte disease (meta-ana	:nsive heart alysis: Figure 3)	Simenson et al. ⁶⁹	Het: 1.9	↓ 0.19 (0.02–1.75)	Ι	I
Hyperte disease (meta-ana	:nsive heart alysis: Figure 3)	Heart attack ^{II,b}	Les: 0.4	~		
Hyperte disease (meta-ana	: nsive heart alysis: Figure 3)	Fredriksen-Goldsen et al. ⁵⁶	Het: 4.3	I	I	↑ 1.51 (0.90–2.52)
Hyperte disease (meta-ana	: nsive heart alysis: Figure 3)	*Heart attackl ^{ia}	SMW: 6.4			↑ 2.28 (I.58–3.29)
disease (meta-ana	alysis: Figure 3)	Boehmer et al. ²⁸	Het: 21.21	↓ 0.87 (0.76–1.01)	↓ 0.79 (0.69–0.91)	
(meta-ana	alysis: Figure 3)	HBPlic	Les: 19.02 Bi: 17.57	↓ 0.99 (0.77–1.26)	↑ 1.21 (0.95–1.53)	
		Diamant et al. ⁵⁰	Het: 17	↓ 0.42 (0.15–1.16)	↓ 0.29 (0.07–1.20)	I
		Hypertension ^{II,c}	Les: 8 Bi: 6	~	~	
		Diamant and Wold ⁴⁹	Her: 15 1	↑ 1 09 (0 48–2 47)	↑ 0 95 (0 49–1 87)	I
		Hvpertension ^{II,c}	Les: 16.3 Bi: 14.5	13.2 (0.4–2.4)	↑ 3.2 (0.5–2.0)	
		Garland-Forshee et al ³⁷	Het: 25.6		0 41 (0 30-0 57)	I
		*HBPlia *HBPlia	Les: 22.9 Bi: 12.4			
		Han at al 60	Hat: 36.4	1012 /053-101	0 64 (0 43_0 96)	
		*HBPI.a	I ec. 29 5 Ri· 27 2			
		McNair et al ³⁸	Her. 2.5			I
		*Hypertonicu (during programmy) ^{Id}		•	•	
		"Hypertension (auring pregnancy)"				
			Het: 2.1	(15.9–75.0) 56.1	↓ U.4/ (U.U/-3.4U)	I
		*Hypertension (other than pregnancy) ^{1,d}	Les: 3.2 Bi: I			
		(both types aggregated for meta-analyses)				
		Simenson et al. ⁶⁹	Het: 28.6	↑ 1.05 (0.71–1.56)	I	1
		Hypertension ^{II,b}	Les: 29.6			
		Williams et al. ⁷³	Het: 46.3	4 0.66 (0.57–0.77)	↓ 0.76 (0.60–0.96)	I
		*Hypertension ^{l,b}	Les: 36.4 Bi: 39.5	~		
		Wolstein et al. ⁴¹	Het: 22.56	4 0.93 (0.92–0.94)	↓ 0.79 (0.78–0.80)	I
		Hypertension ^{I,d}	Les: 21.28 Bi: 18.75			
		Caceres et al. ³¹	Het: 8.4	I	I	↓ 0.79 (0.38–I.62)
		*Hypertension, exam. ^{I,e}	SMW: 6.8			↑ 1.12 (0.52–2.41)
		Caceres et al. ³¹	Het: 23.8	I	I	↓ 0.73 (0.49–1.08)
		Hypertension, sr. ^{l,e}	SMW: 18.6			↓ 0.76 (0.49–1.18)
		Fredriksen-Goldsen et al. ¹³	Het: 43.33	I	I	↓ 0.74 (0.54–1.00)
		*HBP ^{I,e}	SMW: 36.02			↓ 0.86 (0.62–1.20)
		Matthews and Lee ⁶⁶	Het: 33.18	1	I	↓ 0.55 (0.34–0.88)
		*Hypertension ^{l,b}	SMW: 21.96			↔ 1.00 (0.43–2.33)
		Strutz et al. ⁷²	Het: 8.6	I	I	↑ 1.01 (0.64–1.59)
		*HBP/hypertension ^{I,e}	SMW: 8.7			↓ 0.98 (0.63–1.53)
		Cochran and Mays ⁹	Het: 14.9	↓ 0.81 (0.34–1.95)	↓ 0.49 (0.15–1.61)	I
		Hypertension ^{I,a}	Les: 12.6 Bi: 7.4	↓ 0.91 (0.35–2.34)	↓ 0.88 (0.23–3.33)	

GED huncargoy GD subcrogy Author(h), word of pathetion. Per, (a), built cargoy Lease of pathetion. Per, (a), built cargoy Lease of pathetion. Serve (a) Constraints in lease of a networks. Constraints in lease of a networks. <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>							
$ \begin{array}{cccccc} \mbox{High} & \mb$	GBD Main category	GBD subcategory	Author(s), year of publication Health condition as indicated in reference, self-reported unless indicated otherwise	Prev. (%)	Lesbian women OR (95% CI) AOR (95% CI)	Bisexual women OR (95% CI) AOR (95% CI)	SMW OR (95% CI) AOR (95% CI)
Attende Attende <t< td=""><td></td><td></td><td>Dilley et al.⁵³ Hypertension/HBPI^{Ic}</td><td>Het: 22.7 Les: 14.7 Bi: 17</td><td>↓ 0.59 (0.42–0.82) ↔ 1.0 (0.6–1.7)</td><td>↓ 0.70 (0.50–0.96) ↑ 1.6 (1.1–2.5)</td><td>1</td></t<>			Dilley et al. ⁵³ Hypertension/HBPI ^{Ic}	Het: 22.7 Les: 14.7 Bi: 17	↓ 0.59 (0.42–0.82) ↔ 1.0 (0.6–1.7)	↓ 0.70 (0.50–0.96) ↑ 1.6 (1.1–2.5)	1
Apprendicular SPW: 183			Eliason et al. ⁵⁴	Het: 20.4			↓ 0.87 (0.79–0.96)
$ \begin{array}{cccc} \mbox{there} \mbox{term} $			*Hypertension (HBP) ^{I.a}	SMW: 18.3			~
Protection Protection Eters 2.3 (ki l: 8) 0.03 (0.02-1/3) 0.06 (0.04-23) 0.06 (0.04-02) 0.06 (0.0			Hutchcraft et al. ⁶²	Het: 30.2	↓ 0.68 (0.46–1.01)	↓ 0.54 (0.32–0.90)	I
$ \begin{array}{ccccc} \mbox{Trend} & \mbox{Her} \mbox{He} \mbox{He}$			Hypertension ^{I,a}	Les: 22.6 Bi: 18.8	↓ 0.93 (0.62–1.41)	↑ 1.41 (0.86–2.3)	
Apprendiction Bits Strwr 153 1051 (0.25-102) 1037 (0.26-1.26) 1027 (0.26-1.26) 1026 (0.26-1.26) 1027 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.26-1.26) 1026 (0.13-0.45) 1026 (0.13-0.4			Patterson ⁶⁷	Het: 22.4 Les: 14	↓ 0.58 (0.28–1.17)	↓ 0.64 (0.44–0.92)	↓ 0.62 (0.45–0.87)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			Hypertension ^{I,a}	Bi: 15.7 SMW: 15.3	↓ 0.51 (0.25–1.02)	↓ 0.87 (0.50–1.48)	↓ 0.76 (0.50–1.18)
		Other or one out of	Blosnich et al. ⁴³	Het: 5.8	↓ 0.86 (0.60–1.24)	↑ 1.24 (0.86–1.78)	I
diseases Concrese et al. ¹¹ Concrese set al. ¹¹ Fredrikten-Goldsen et al. ¹³ Condoraction fessards Her 0.71 Her 0.71 - - - 0.068 (03 0.006 (03 0.007-109) - - - 0.068 (03 0.006 (03 0.006 - 50) Credrose stat Her 0.71 - - - - 0.068 (03 0.006 - 109) - - - 0.068 (03 0.006 - 50) - - - 0.068 (03 0.006 - 50) - - - 0.008 (03 0.006 - 50) - - - 0.068 (03 0.006 - 50) - - - 0.068 (03 0.006 - 50) - - 0.008 (03 0.006 - 50) - - - 0.008 (03 0.006 - 50) - - - 0.008 (03 0.006 (03 0.006 - 50) - - - 0.008 (03 0.006 (03 0.006 - 50) - - - 0.008 (03 0.006 (03 0.006 - 50) - - - 0.008 (03 0.008 (03 0.006 - 50) - - - 0.008 (03 0.008 (03 0.006 (03 0.006 - 50) - - - - 0.008 (03 0.008 (03		multiple cardiovascular	CVD symptoms ^{I,a}	Les: 5 Bi: 7			
$ \begin{array}{llllllllllllllllllllllllllllllllllll$		diseases	Caceres et al. ³¹	Het: 3.3	I	I	↓ 0.84 (0.38–I.85)
$ \begin{array}{c cccc} \mbox{Finitesn-Goldeen et al.} \\ \mbox{Finitesn-Finitesn-Goldeen et al.} \\ \mbox{Finitesn-Finitesn-Goldeen et al.} \\ \mbox{Finitesn-Finitesn-Finitesn-Goldeen et al.} \\ \mbox{Finitesn-Finitesn-Finitesn-Goldeen et al.} \\ Finitesn-Finitesn$			CVD diagnosis ^{I,e}	SMW: 2.8			↓ 0.69 (0.29–1.66)
$ \begin{array}{llllllllllllllllllllllllllllllllllll$			Fredriksen-Goldsen et al. ¹³	Het: 10.71	I	I	↓ 0.98 (0.73–1.31)
$ \begin{array}{cccccc} \mbox{Correlate et al}^{7} & \mbox{Her} 62 & \end{tabular} 0.064(0.37-10) & \end{tabular} 0.027(0.22-9) & ta$			Cardiovascular disease ^{l,e}	SMW: 10.51			↑ 1.37 (1.00–1.86)
$ \begin{array}{c cccc} {\rm Cardosseular disease^{1} \\ {\rm Cardosseular disease^{1} \\ {\rm Contrales and HemingSmith's \\ {\rm Cardosseular disease^{1} \\ {\rm Cardosseular dise$			Garland-Forshee et al. ³⁷	Het: 6.2	↓ 0.64 (0.37–1.09)	↓ 0.29 (0.13–0.65)	I
$ \begin{array}{llllllllllllllllllllllllllllllllllll$			Cardiovascular disease ^{la}	Les: 4 Bi: 1.8	↔ 1.0 (0.5–1.9)	↓ 0.7 (0.2–2.9)	
Chronic Asthmat Les: 28 B: 23 0.01 ($0.61-1.37$) 1.102 ($0.77-1.44$) Stroke Dai and Hao? Les: 41 Les: 47 0.08 ($0.36-2.07$) $ -$ Stroke Dai and Hao? Les: 18 Les: 13 1.118 ($0.81-1.72$) 1.10 ($0.80-1.50$) $-$ Stroke Dai and Hao? Les: 24 Her: 31 1.118 ($0.81-1.72$) 1.10 ($0.80-1.50$) $-$ Stroke ¹⁰ Her: 41 Les: 25 B: 14 0.21 ($0.34-2.07$) $ -$ <td></td> <td></td> <td>Gonzales and Henning-Smith⁵⁸</td> <td>Het: 5.2</td> <td>↓ 0.52 (0.39–0.70)</td> <td>↓ 0.43 (0.33–0.55)</td> <td></td>			Gonzales and Henning-Smith ⁵⁸	Het: 5.2	↓ 0.52 (0.39–0.70)	↓ 0.43 (0.33–0.55)	
Stroke Simeson et al. ⁶ Cardiovscular disease ¹⁰ Her 4.7 Les 3.1 $0.06 (0.3-2.07)$ $ -$			Cardiovascular disease ^{la}	Les: 2.8 Bi: 2.3	↓ 0.91 (0.61–1.37)	↑ 1.02 (0.72–1.44)	
Stroke Cardiovacular disease ^{1b} Les: 41 1.10 (030-1.50) - Stroke Date Alt Ese 31 1.10 (030-1.50) - Stroke Watchcraft et al. ³ Het 29 8:34 1.10 (030-1.50) - Stroke Watchcraft et al. ³ Het 29 Eig 31:4 7.19 (03-2.56) 0.036 (005-2.56) - Stroke Eres 25 Bit 14 7.219 (03-3.15) -			Simenson et al. ⁶⁹	Het: 4.7	↓ 0.86 (0.36–2.07)	-	I
Stroke Dai ad Hao ⁷ Her 3.1 \uparrow 1.18 (0.81-1.72) \uparrow 1.10 (0.80-1.50) - "Stroke" "Stroke" Les: 25 Bi: 14 \uparrow 2.19 (0.94-5.09) \uparrow 1.16 (0.76-2.56) - - "Stroke" Hutchcraft et al." Her: 14 \downarrow 0.098 (0.35-2.66) \downarrow 0.36 (0.05-2.56) - - "Stroke" Her: 14 Her: 14 \downarrow 0.35 (0.09-3.15) - 1.13 (0.72-16) - - - 1.212 (1.3 - - - - - - - 1.212 (1.3 - - - 1.212 (1.3 - - - 1.212 (1.3 - - 1.212 (1.3 - - - 1.212 (1.3 - - 1.212 (1.3 - - 1.212 (1.3 -			Cardiovascular disease ^{II,b}	Les: 4.1			
Stroke ^{1a} Les: 3.6 Bi: 3.4 $(332-5.6)$ $(332-5.6)$ $(336-2.64)$ $(336-2.64)$ Hutchcraft et al. ⁵ Fine (3032-5.66) $(332-5.66)$ $(3036-2.64)$ $(336-2.64)$ $(336-2.64)$ Stroke ^{1a} Stroke ^{1a} Les: 0.7 $(392-3.15)$ $(394-3.04)$ $(376-2.24)$ Stroke ^{1a} Stroke ^{1a} Les: 0.7 $(392-3.15)$ $(394-3.44)$ $(326-2.64)$ Stroke ^{1a} Stroke ^{1a} Les: 0.7 $(392-3.15)$ $(394-3.44)$ $(326-2.64)$ Stroke ^{1a} VXNitroke ^{1a} Les: 5.5 Bi: 4.1 $(1.14, (0.3-1.57)$ $(0.04-7.1.49)$ $(2.12/1.3)$ Chronic Asthma Blosnich et al. ¹³ Her: 5.1 (-5.3) $(1.14, (0.2-2.63))$ $(2.12/1.3)$ Chronic Asthma Blosnich et al. ¹³ Her: 1.367 $(1.45-1.90)$ $(1.27-2.63)$ $(2.124-1.67)$ Stroke ^{1a} Bosinder et al. ¹³ Les: 5.2 Bi: 2.6.4 $(1.45-1.39)$ $(1.4, 07-2.43)$ Asthma Blosnich et al. ¹³ Les: 5.078 Bi: 21.46 $(1.47-1.49)$ $(1.4, 07-2.43)$ Stroke ^{1a} Asthma ^{1a} Les: 5.078 Bi: 26.4 $(1.46-1.197)$		Stroke	Dai and Hao ⁴⁷	Het: 3.I	↑ 1.18 (0.81–1.72)	↑ 1.10 (0.80–1.50)	I
Hutchcraft et al. ⁴³ Here 2.9 $0.98 (0.36-2.66)$ $0.036 (0.05-2.56)$ $-$ Stroke ¹⁰ Stroke ¹⁰ Less 29 B: 1.4 $7.219 (0.94-5.09)$ $1.16 (0.78-2.84)$ $-$ Stroke ¹⁰ Stroke ¹⁰ Here 1.4 $0.02 (0.09-3.15)$ $ -$ Stroke ¹⁰ Stroke ¹⁰ Less 0.7 $1.16 (0.78-2.84)$ $ -$			*Stroke ^{l,a}	Les: 3.6 Bi: 3.4			
Stroke ¹ Stroke ¹ Les: 29 Bi: 14 $7.19 (0.94-5.09)$ $7.1.16 (0.78-2.84)$ - Simenson et al. ⁶ Her: 14 $0.52 (0.09-3.15)$ $-1.16 (0.78-2.84)$ - - - Stroke ¹⁰ Eres: 07 Her: 14 $0.52 (0.09-3.15)$ $0.64 (0.47-1.49)$ - -			Hutchcraft et al. ⁶²	Het: 2.9	↓ 0.98 (0.36–2.66)	↓ 0.36 (0.05–2.56)	I
Simenson et al. ⁶⁰ Stroke ¹⁰ Stroke ¹⁰ Her 1,4 Stroke ¹⁰ $(-532 (009-3.15)$ Stroke ¹⁰ - - <td></td> <td></td> <td>Stroke^{l,a}</td> <td>Les: 2.9 Bi: 1.4</td> <td>† 2.19 (0.94–5.09)</td> <td>↑ 1.16 (0.78–2.84)</td> <td></td>			Stroke ^{l,a}	Les: 2.9 Bi: 1.4	† 2.19 (0.94–5.09)	↑ 1.16 (0.78–2.84)	
Stroke ^(b) Stroke ^(b) Les: 0.7 \uparrow 1.14 (0.83-1.57) \downarrow 0.84 (0.47-1.49) $-$ Williams et al.7 Her: 4.9 \uparrow 1.14 (0.83-1.57) \downarrow 0.84 (0.47-1.49) $-$ Fredriken-Goldsen et al.5 Her: 5.1 Les: 5.5 Bit 4.1 $ \uparrow$ 1.35 (0.8 Chronic Asthma Blosnich et al.3 Her: 5.1 $ \uparrow$ 1.35 (0.8 Receiver coldsen et al.6 NW: 6.1 Stroke ^(b) Her: 5.1 $ \uparrow$ 1.35 (0.8 Receiver coldsen et al.7 Her: 5.1 $ -$			Simenson et al. ⁶⁹	Het: I.4	↓ 0.52 (0.09–3.15)		I
Williams et al. ⁷³ Her 4.9 \uparrow 1.14 (0.83-1.57) \downarrow 0.84 (0.47-1.49) - *CVAstroke ^{1b} Eredritsen-Goldsen et al. ⁵⁶ Her 5.1 - - \uparrow 1.35 (0.8 Fredritsen-Goldsen et al. ⁵⁶ Her 5.1 - - \uparrow 1.35 (0.8 Chronic Asthma Bionche et al. ⁴³ Her 15.3 \uparrow 1.50 (1.31-1.92) \uparrow 1.98 (1.61-2.45) - Stooke ^{1a} Snoke ^{1a} NWY: 6.8 \uparrow 1.50 (1.04-2.16) \uparrow 1.68 (1.07-2.63) \uparrow 1.31 (1.92, 1.92) \uparrow 1.36 (1.07-2.63) Respiratory (meta-analysis: Figure 4) $\$$ sthma ^{1c} Les: 20.78 Bi: 21.46 \uparrow 1.66 (1.45-1.90) \uparrow 1.68 (1.07-2.63) \uparrow 1.36 (1.07-2.63) Asthma ^{1c} Les: 13.61 Her 13.67 \uparrow 1.66 (1.45-1.90) \uparrow 1.68 (1.07-2.63) \uparrow 1.36 (1.07-2.63) Asthma ^{1c} Les: 20.78 Bi: 21.46 \uparrow 1.41 (1.14-1.73) \uparrow 1.52 (1.24-1.87) $-$ Asthma ^{1c} Les: 13.61 \uparrow 1.66 (1.45-1.90) \uparrow 1.68 (1.07-2.63) $-$ Asthma ^{1c} Les: 13.63 \uparrow 1.46 \uparrow 1.41 (1.14-1.73) \uparrow 1.66 (1.45-1.97) $-$ Asthma ^{1c} Asthma ^{1c} Les: 13.63 \uparrow 1.			Stroke ^{II,b}	Les: 0.7			
*CVA/stroke ^{1b} tes: 5.5 Bit 4.1 tes: 5.1 tes: 5.1 <thtes: 5.1<="" th=""> tes: 5.1 tes: 5.1</thtes:>			Williams et al. ⁷³	Het: 4.9	↑ 1.14 (0.83–1.57)	↓ 0.84 (0.47–I.49)	I
Fredriksen-Goldsen et al. ⁵⁶ Her. 5.1 - - \uparrow 1.35 (0.8 Stroke ^{1a} Stroke ^{1a} SmW: 6.8 \uparrow 1.53 (1.31-1.92) \uparrow 1.98 (1.61-2.45) \uparrow 2.12 (1.5 Chronic Asthma Blosnich et al. ⁴³ Her. 15.3 \uparrow 1.59 (1.31-1.92) \uparrow 1.98 (1.61-2.45) \uparrow 2.12 (1.5 respiratory (meta-analysis: Figure 4) *Asthma ^{1a} Les: 22.2 Bi: 26.4 \uparrow 1.50 (1.04-2.16) \uparrow 1.68 (1.07-2.63) \uparrow 2.12 (1.5 Boehmer et al. ³⁸ Her. 15.3 \uparrow 1.50 (1.04-2.16) \uparrow 1.68 (1.07-2.63) $-$ 1.53 (0.77-3.01) $-$ 51.190 \uparrow 1.53 (0.77-3.01) $-$ 51.190 \uparrow 1.53 (0.77-3.01) $-$ 65 (1.24-1.87) $-$ 1.53 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.56 (1.03-1.53) \uparrow 1.53 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.56 (1.03-1.53) \uparrow 1.60 (1.04-2.8) $-$ 1.60 (1.04-2.8) $-$ 1.60 (1.04-2.1.87) $-$ 1.53 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55 (0.77-3.01) $-$ 1.55			*CVA/stroke ^{l,b}	Les: 5.5 Bi: 4.1			
Stroke ^{1a} Stroke ^{1a} Stroke ^{1a} Stroke $\uparrow 2.12 (1.5)$ Chronic Asthma Blosnich et al. ⁴³ Her: 15.3 $\uparrow 1.59 (1.31-1.92)$ $\uparrow 1.98 (1.61-2.45)$ $\uparrow 2.12 (1.5)$ respiratory (meta-analysis: Figure 4) *Asthma ^{1a} Les: 22.2 Bi: 26.4 $\uparrow 1.50 (1.04-2.16)$ $\uparrow 1.68 (1.07-2.63)$ $-2.12 (1.5)$ Asthma ^{1c} Boehmer et al. ²⁸ Her: 13.67 $\uparrow 1.66 (1.45-1.90)$ $\uparrow 1.73 (1.52-1.97)$ $-1.68 (1.07-2.63)$ Asthma ^{1c} Les: 20.78 Bi: 21.46 $\uparrow 1.41 (1.14-1.73)$ $\uparrow 1.52 (1.24-1.87)$ $-1.53 (0.77-3.90)$ $\uparrow 1.52 (1.24-1.87)$ Asthma ^{1c} Les: 16.3 Bi: 14.5 $\uparrow 1.71 (0.7-3.9)$ $\uparrow 1.32 (0.77-3.90)$ $\uparrow 1.32 (0.77-3.90)$ $-1.52 (0.77-3.90)$ $-1.52 (1.24-1.87)$ Asthma ^{1c} Les: 16.3 Bi: 14.5 $\uparrow 1.71 (0.7-3.9)$ $\uparrow 1.32 (0.77-3.90)$ $-1.52 (0.77-3.90)$ $-1.52 (0.77-3.90)$ $-1.62 (1.0-2.2.8)$ Asthma ^{1c} Les: 16.3 Bi: 14.5 $\uparrow 1.7 (0.7-3.9)$ $\uparrow 1.4 (0.7-2.8)$ $-1.2 (0.7-2.8)$ $-1.2 (0.7-2.8)$ $-1.2 (0.7-2.8)$ $-1.2 (0.7-2.8)$ $-1.2 (0.7-2.8)$ $-1.2 (0.7-2.8)$ $-1.2 (0.7-2.8)$			Fredriksen-Goldsen et al. ⁵⁶	Het: 5.I	I	I	1.35 (0.82–2.21)
Chronic Asthma Blosnich et al. ⁴³ Her: I5.3 \uparrow I.59 (I.31-I.92) \uparrow I.98 (I.61-2.45) - respiratory (meta-analysis: Figure 4) *Asthma ^{1a} Les: 22.2 Bi: 26.4 \uparrow I.50 (I.04-2.16) \uparrow I.68 (I.07-2.63) - respiratory (meta-analysis: Figure 4) *Asthma ^{1a} Les: 22.2 Bi: 26.4 \uparrow I.50 (I.04-2.16) \uparrow I.68 (I.07-2.63) - Asthma ^{1c} Les: 20.78 Bi: 21.46 \uparrow I.41 (I.14-1.73) \uparrow I.52 (I.24-I.87) - Asthma ^{1c} Les: 20.78 Bi: 21.46 \uparrow I.41 (I.14-1.73) \uparrow I.53 (0.77-3.01) - Asthma ^{1c} Les: 10.5 Her: 10 \uparrow I.7 (0.7-3.96 \uparrow I.6 (0.7-2.8) - Asthma ^{1c} Les: 16.3 Bi: 14.5 \uparrow I.7 (0.7-3.96 \uparrow I.4 (0.7-2.8) - - Asthma ^{1c} Les: 16.5 Bi: 21.46 \uparrow I.7 (0.7-3.9) \uparrow I.4 (0.7-2.8) -			Stroke ^{l,a}	SMW: 6.8			T 2.12 (1.57–2.87)
respiratory(meta-analysis: Figure 4)*AsthmalaLes: 22.2 Bi: 26.4 \uparrow 1.50 (1.04–2.16) \uparrow 1.68 (1.07–2.63)diseasesBoehmer et al. ²⁸ Her: 13.67 \uparrow 1.66 (1.45–1.90) \uparrow 1.73 (1.52–1.97)-AsthmalcLes: 20.78 Bi: 21.46 \uparrow 1.41 (1.14–1.73) \uparrow 1.52 (1.24–1.87)-Diamant and Wold*9Her: 10 \uparrow 1.75 (0.77–3.96) \uparrow 1.53 (0.77–3.01)-AsthmalcLes: 16.3 Bi: 14.5 \uparrow 1.7 (0.7–3.9) \uparrow 1.4 (0.7–2.8)AsthmalcLes: 16.3 Bi: 14.5 \uparrow 1.7 (0.7–3.9) \uparrow 1.4 (0.7–2.8)AsthmalcLes: 19.92 Bi: 31.88 \uparrow 1.26 (1.03–1.53) \uparrow 2.37 (1.97–2.84)AsthmalaLes: 19.92 Bi: 31.88 \uparrow 1.26 (1.03–1.53) \uparrow 2.17AsthmalaLes: 13.92 \uparrow 1.95 (1.59–2.39) \uparrow 2.17AsthmalaLes: 13.92 \uparrow 1.31 (0.98–1.76) \uparrow 2.48 (1.93–3.20)AsthmalaLes: 13.72 \uparrow 1.31 (0.98–1.76) \uparrow 2.48 (1.93–3.20)AsthmalaLes: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6)	Chronic	Asthma	Blosnich et al. ⁴³	Het: 15.3	1.59 (I.3 I–I.92)	1.98 (1.61–2.45)	I
diseases Boehmer et al. ²⁸ Her: 13.67 \uparrow 1.66 (1.45–1.90) \uparrow 1.73 (1.52–1.97) – Asthma ^{1/c} Diamant and Wold ⁴⁹ Her: 13.67 \uparrow 1.41 (1.14–1.73) \uparrow 1.52 (1.24–1.87) Asthma ^{1/c} Diamant and Wold ⁴⁹ Her: 10 \uparrow 1.75 (0.77–3.96) \uparrow 1.53 (0.77–3.01) – Asthma ^{1/c} E-es: 16.3 Bi: 14.5 \uparrow 1.7 (0.7–3.9) \uparrow 1.63 (0.7–2.9) \uparrow 1.60 (1.97–2.84) = E-es: 15.9 Si: 14.5 \uparrow 1.7 (0.7–3.9) \uparrow 1.4 (0.7–2.8) = E-es: 15.9 Si: 14.5 \uparrow 1.7 (0.7–3.9) \uparrow 1.4 (0.7–2.9) \uparrow 1.40 (1.97–2.84) = E-es: 19.92 Bi: 31.88 \uparrow 1.26 (1.03–1.53) \uparrow 2.37 (1.97–2.84) = E-es: 19.92 Bi: 31.88 \uparrow 1.26 (1.03–1.53) \uparrow 2.17 (1.97–2.84) = E-es: 19.92 Bi: 31.88 \uparrow 1.26 (1.03–1.53) \uparrow 2.17 (1.97–2.84) = E-es: 19.92 Bi: 31.88 \uparrow 1.26 (1.03–1.53) \uparrow 2.17 (1.97–2.92) = E-es: 19.92 Bi: 31.88 \uparrow 1.26 (1.02–1.71) \uparrow 1.65 (1.17–2.32) = E-es: 15.4 Bi: 27.20 \uparrow 1.31 (0.98–1.76) \uparrow 2.48 (1.93–3.20) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \downarrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \downarrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \downarrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \downarrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \downarrow 1.2 (0.8–1.9) \downarrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \downarrow 1.2 (0.8–1.9) \downarrow 2.4 (1.5–3.6) = E-es: 15.4 Bi: 25.6 \downarrow 2.2 (1.2 (2.2 2.2) (2.2 (2.2 2.2) (2.2 (2.2 2.2) (2.2 (2.2	respiratory	(meta-analysis: Figure 4)	*Asthma ^{l,a}	Les: 22.2 Bi: 26.4	1.50 (I.04–2.16)	1.68 (I.07–2.63)	
AsthmalcLes: 20.78 Bi: 21.46 \uparrow 1.41 (1.14-1.73) \uparrow 1.52 (1.24-1.87)Diamant and Wold*9Her: 10 \uparrow 1.75 (0.77-3.96) \uparrow 1.53 (0.77-3.01)AsthmalcLes: 16.3 Bi: 14.5 \uparrow 1.77 (0.7-3.9) \uparrow 1.4 (0.7-2.8)Fredriksen-Goldsen et al.55Her: 16.53 \uparrow 1.76 (0.7-3.9) \uparrow 1.4 (0.7-2.9)SathmalcLes: 19.92 Bi: 31.88 \uparrow 1.26 (1.03-1.53) \uparrow 2.37 (1.97-2.84)AsthmalcLes: 19.92 Bi: 31.88 \uparrow 1.26 (1.03-1.53) \uparrow 2.17AsthmalcLes: 13.92 \uparrow 1.95 (1.59-2.39) \uparrow 2.17AsthmalcLes: 24 Bi: 27.20 \uparrow 1.31 (0.98-1.70) \uparrow 1.65 (1.17-2.32)*AsthmalaLes: 15.4 Bi: 25.6 \uparrow 1.2 (0.8-1.9) \uparrow 2.48 (1.93-3.20)	diseases		Boehmer et al. ²⁸	Het: 13.67	1.66 (I.45–I.90)	1.73 (1.52–1.97)	I
Diamant and Wold ⁴⁹ Het: 10 \uparrow 1.75 (0.77–3.96) \uparrow 1.53 (0.77–3.01)-AsthmaltcLes: 16.3 Bi: 14.5 \uparrow 1.7 (0.7–3.9) \uparrow 1.4 (0.7–2.8)Fredriksen-Goldsen et al.55Het: 16.53 \uparrow 1.26 (1.03–1.53) \uparrow 2.37 (1.97–2.84)-*AsthmaltaLes: 19.92 Bi: 31.88 \uparrow 1.26 (1.03–1.53) \uparrow 2.17-Gao and Mansh57Het: 13.92 \uparrow 1.95 (1.59–2.39) \uparrow 2.17-AsthmaltbLes: 24 Bi: 27.20 \uparrow 1.31 (0.98–1.71) \uparrow 1.65 (1.17–2.32)-*AsthmaltaLes: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.48 (1.5–3.6)-			Asthma ^{l,c}	Les: 20.78 Bi: 21.46	↑ I.4I (I.14–I.73)	† 1.52 (1.24–1.87)	
Asthma ^{1/2} Les: 16.3 Bi: 14.5 1.7 (0.7–3.9) 1.4 (0.7–2.8) Fredriksen-Goldsen et al. ⁵⁵ Her: 16.53 7 1.26 1.23 7 2.37 $1.97-2.84$ $-$ *Asthma ^{1a} Les: 19.92 Bi: 31.88 7 1.26 7.17 $0.7-2.9$ $-$ Gao and Mansh ⁵⁷ Her: 13.92 7 1.26 7.17 $0.7-2.9$ $-$ Asthma ^{1b} Les: 19.92 Bi: 31.88 7 1.26 7.17 $0.2.31$ (1.97–2.94) $-$ Gao and Mansh ⁵⁷ Les: 13.92 7 1.26 7 1.27 7.17 7.231 (1.92–2.92) $-$ Asthma ^{1a} Les: 24 Bi: 27.20 7 1.32 (1.02–1.71) 7.46 (1.7–2.32) $-$ *Asthma ^{1a} Les: 15.4 Bi: 25.6 7.2 (0.8–1.9) 7.4 (1.5–3.6) $ -$			Diamant and Wold ⁴⁹	Het: 10	↑ 1.75 (0.77–3.96)	1.53 (0.77–3.01)	I
Fredriksen-Goldsen et al.55Het: 16.53 \uparrow 1.26 (1.03-1.53) \uparrow 2.37 (1.97-2.84)*AsthmalaLes: 19.92 Bi: 31.88 \uparrow 1.23 \uparrow 2.17Gao and Mansh57Het: 13.92 \uparrow 1.39 \uparrow 2.31 (1.82-2.92)AsthmalubLes: 24 Bi: 27.20 \uparrow 1.37 (1.02-1.71) \uparrow 1.65 (1.17-2.32)Garland-Forshee et al.37Het: 12.1 \uparrow 1.31 (0.98-1.76) \uparrow 2.48 (1.93-3.20)*AsthmalaLes: 15.4 Bi: 25.6 \uparrow 1.2 (0.8-1.9) \uparrow 2.4 (1.5-3.6)			Asthma ^{ll,c}	Les: 16.3 Bi: 14.5	↑ 1.7 (0.7–3.9)	↑ 1.4 (0.7–2.8)	
*Asthmala Les: 19.92 Bi; 31.88 \uparrow 1.23 \uparrow 2.17 Gao and Mansh ⁵⁷ Het: 13.92 \uparrow 1.95 (1.59–2.39) \uparrow 2.31 (1.82–2.92) Asthmal ^{1,b} Les: 24 Bi: 27.20 \uparrow 1.95 (1.02–1.71) \uparrow 1.65 (1.17–2.32) Garland-Forshee et al. ³⁷ Het: 12.1 \uparrow 1.31 (0.98–1.76) \uparrow 2.48 (1.93–3.20) *Asthmala Les: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6)			Fredriksen-Goldsen et al. ⁵⁵	Het: 16.53	↑ 1.26 (1.03–1.53)	↑ 2.37 (I.97–2.84)	I
Gao and Mansh ⁵⁷ Het: 13.92 \uparrow 1.95 (1.59–2.39) \uparrow 2.31 (1.82–2.92) $-$ Asthma ^{1/b} Les: 24 Bi: 27.20 \uparrow 1.32 (1.02–1.71) \uparrow 1.65 (1.17–2.32) Garland-Forshee et al. ³⁷ Het: 12.1 \uparrow 1.31 (0.98–1.76) \uparrow 2.48 (1.93–3.20) $-$ *Asthma ^{1a} Les: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6) $-$			*Asthma ^{l,a}	Les: 19.92 Bi: 31.88	↑ <i>1.</i> 23	↑ 2.17	
Asthma ^{llb} Les: 24 Bi: 27.20 7 1.32 (1.02–1.71) 7 1.65 (1.17–2.32) Garland-Forshee et al. ³⁷ Het: 12.1 7 1.31 (0.98–1.76) 7 2.48 (1.93–3.20) *Asthma ^{la} Les: 15.4 Bi: 25.6 7 1.2 (0.8–1.9) 7 2.4 (1.5–3.6)			Gao and Mansh ⁵⁷	Het: 13.92	1.95 (1.59–2.39)	1 2.31 (1.82–2.92)	I
Garland-Forshee et al. ³⁷ Het: 12.1 ↑ 1.31 (0.98–1.76) ↑ 2.48 (1.93–3.20) - *Asthma ^{Ia} *Asthma ^{Ia} Les: 15.4 Bi: 25.6 ↑ <i>1.2 (0.8–1.9)</i> ↑ 2.4 (1.5–3.6)			Asthma ^{ll,b}	Les: 24 Bi: 27.20	† 1.32 (1.02–1.71)	† 1.65 (I.I7–2.32)	
*Asthma ^{1a} Les: 15.4 Bi: 25.6 \uparrow 1.2 (0.8–1.9) \uparrow 2.4 (1.5–3.6)			Garland-Forshee et al. ³⁷	Het: 12.1	↑ 1.31 (0.98–1.76)	↑ 2.48 (I.93–3.20)	I
			*Asthma ^{l,a}	Les: 15.4 Bi: 25.6	↑ 1.2 (0.8–1.9)	↑ 2.4 (I.5–3.6)	

Table 3. (Cont	inued)					
GBD Main category	GBD subcategory	Author(s), year of publication Health condition as indicated in reference, self-reported unless indicated otherwise	Prev. (%)	Lesbian women OR (95% CI) AOR (95% CI)	Bisexual women OR (95% CI) AOR (95% CI)	SMW OR (95% CI) AOR (95% CI)
		Gonzales and Henning-Smith ⁵⁸ *Aethma ^{la}	Het: II.6 Les: I5 5 Bi: 23 7	↑ 1.40 (1.22–1.59) ↑ 1 33 (1 04–1 72)	↑ 2.37 (2.16–2.59) ↑ 1 99 /1 65–2 40)	1
		Han et al. ⁶⁰	Het: 9.7	1.65 (1.08–2.51)	1.39 (0.82–2.36)	I
		*Asthma ^{I,a}	Les: 15 Bi: 13.1			
		McNair et al. ³⁸	Het: 9.8	↓ 0.79 (0.32–1.98)	† 2.02 (I.20–3.38)	I
		*Asthma ^{ld}	Les: 7.9 Bi: 18			
		Patterson and Jabson ⁶⁷ *Asthma ^{Ia}	Het: 17 Les: 43.2 Bi: 31.4 SMW: 34.1	↑ 3.66 (2.21–6.07) ↑ 3.19 (1.37–7.47)	↑ 2.25 (1.68–3.01) ↑ 1.70 (1.12–2.58)	↑ 2.52 (1.95–3.25) ↑ 1.98 (1.32–2.98)
		Wolstein et al. ⁴¹	Het: 15.04	↑ 1.68 (1.67–1.70)	↑ 1.56 (1.55–1.58)	
		Asthma ^{l,d}	Les: 22.96 Bi: 21.69			
		Matthews and Lee ⁶⁶ *Asthma th	Het: 15.71 SMW: 27.69	I	I	↑ 1.96 (1.19–3.22) ↑ 1.94 (0.96–3.92)
		Cochran and Mays ⁹	Het: 8.6	↑ 1.52 (0.63–3.67)	↑ 2.40 (I.03–5.60)	-
		Asthma ^{l,a}	Les: 13.1 Bi: 19.2	↑ 1.38 (0.57–3.31)	↑ 2.00 (0.85–4.70)	
		Dilley et al. ⁵³	Het: 11.2	↑ 1.71 (1.38–2.12)	1 2.10 (1.71–2.58)	I
		Asthma ^{l,c}	Les: 17.7 Bi: 21	↑ 1.7 (1.3–2.3)	↑ 2.0 (1.5–2.6)	
		Eliason et al. ⁵⁴	Het: 14	I	1	† 1.73 (1.58–1.90)
		*Adult Asthma ^{l,a}	SMW: 22			
		Fredriksen-Goldsen et al. ¹³	Het: 15.89	I	I	1.37 (I.10–1.70)
		Asthma ^{l,e}	SMW: 20.57			T 1.20 (0.96–1.49)
		Fredriksen-Goldsen et al. ⁵⁶ *^le	Het: 13.7 SMM/- 19	I	I	↑ 1.37 (0.99–1.90) ↑ 1.38 (1.12, 1.53)
			01.171.10			(
		Hutchcraft et al. ⁶²	Het: 14.4	1.61 (1.07–2.41)	1.90 (I.18–3.04)	I
		Asthma ^{l.a}	Les: 21.6 Bi: 24.7	1 1.45 (0.89–2.37)	T 1.40 (0.74–2.66)	
		Kim and Fredriksen-Goldsen ⁶³	Het: 12.02	T 6.32 (3.40–11.75)	1 2.89 (I.64–5.11)	I
		Asthma ^{1,d}	Les: 45.6 Bi: 27.9			
	COPD	Fredriksen-Goldsen et al. ³⁰	Het: 6	1	I	\downarrow 0.85 (0.49–1.49)
			2.5 : 7			1.08 (0.83–1.41)
		Hutchcraft et al. ⁵² COPD ^{Ia}	Het: 3.3 Les: 2.7 Bi: 2	↓ 0.86 (0.32–2.33) ↑ 1.98 (1.09–3.56)	\downarrow 0.63 (0.15–2.57) \uparrow 1.44 (0.64–3.25)	I
		Simenson et al. ⁶⁹	Het: 3.8	↓ 0.68 (0.24–1.91)		I
		COPD ^{II,b}	Les: 2.6	~		
		Williams et al. ⁷³	Het: 5.6	↓ 0.98 (0.71–1.36)	↑ 1.04 (0.64–1.70)	I
		COPD ^{Ib}	Les: 5.5 Bi: 5.8			
	Other or one out	Diamant and Wold ⁴⁹	Het: 4.6	↑ 1.01 (0.2 4 4 .22)	↑ 1.98 (0.84–4.62)	I
	of multiple chronic	Chronic respiratory con. ^{II,c}	Les: 4.7 Bi: 8.7	↓ 0.8 (0.2–3.5)	↑ 1.6 (0.7–3.9)	
	respiratory diseases	Gonzales and Henning-Smith ⁵⁸	Het: 7.5	↑ 1.09 (0.91–1.29)	↑ I.16 (I.02–I.33)	I
		COPD (and others) ^{I,a}	Les: 8.1 Bi: 8.6	↑ 1.54 (1.11–2.16)	↑ I.83 (I.40–2.39)	
		Han et al. ⁶⁰	Het: 8.9	↑ I.89 (I.25–2.87)	↑ 1.42 (0.83–2.45)	I
		Bronchitis/COPD ^{I,a}	Les: 15.6 Bi: 12			
		Patterson and Jabson ⁶⁷	Het: 6.6 Les: 18	1 2.99 (I.55–5.80)	1.31 (0.80–2.12)	↑ 1.65 (1.11–2.45)
		Chronic bronchitis ^{la}	Bi: 8.2 SMW: 10.4	† 2.64 (I.21–5.72)	↑ 1.05 (0.60–1.81)	† 1.38 (0.92–2.06)
						(Continued)

GBD Main category	GBD subcategory	Author(s), year of publication Health condition as indicated in reference, self-reported unless indicated otherwise	Prev. (%)	Lesbian women OR (95% CI) AOR (95% CI)	Bisexual women OR (95% CI) AOR (95% CI)	SMW OR (95% CI) AOR (95% CI)
Diabetes and chronic kidney	Chronic kidney diseases	Strutz et al. ⁷² Asthma/chronic bronchitis/emphysema ^{le} Dai and Hao ⁴⁷ *Kidney disease ^{l.a}	Het: 16.5 SMW: 24.5 Het: 3 Les: 1.8 Bi: 2.9	- ↓ 0.60 (0.35–1.02)	- ↓ 0.97 (0.69–1.35)	↑ 1.64 (1.17–2.31) ↑ 1.54 (1.10–2.16) -
diseases		Diamant et al. ⁵⁰	Het:	† 1.98 (0.27–14.67)	† 2.83 (0.38–21.13)	I
		Kidney disease ^{nc} Han et al. ⁶⁰	Les: 2 Bi: 3 Het: 3.5	↓ 0.82 (0.3 1 –2.01)	† 1.17 (0.48–2.87)	I
	Diabetes	*Kidney disease ^{1.4} Blosnich et al. ⁴³ *Contectal	Les: 3.1 Bi: 3.7 Het: 10.2	↓ 0.65 (0.47–0.88)	↓ 0.58 (0.40–0.86)	I
	(meta-analysis: rigure o)	"Diabetes" Clark et al. ⁴⁶	Les: o.g bi: o.l Het: 6	↑ 0.59 (0.19–1.90)	↓ 0.75 (0.44–1.29) ↑ 1.14 (0.63–2.07)	I
		*Diabetes, exam./sr./med ^{tb}	Les: 1.9 Bi: 6.8			
		Diamant et al. ⁵⁰ Diahetes ^{lic}	Het: 6 Les: 2 Bi: 14	↓ 0.31 (0.0 4– 2.27)	↑ 2.52 (0.97–6.54)	I
		Diamant and Wold ⁴⁹	Het: 5.2	↑ 2.40 (0.94–6.16)	↓ 0.83 (0.26–2.66)	I
		Diabetes ^{II,c}	Les: 11.6 Bi: 4.4	↑ 2.4 (0.9–6.6)	↑ 3.2 (0.3–3.2)	
		Pilley et al. ⁵³ *Disheter /ox Prod and CDNe	Het: 6.3 Los: 5 LBi: 5 8	↓ 0.80 (0.55–1.15) ↑ / 2 /08–2 0)	↓ 0.93 (0.65–1.32) ↑ 1 ₽ /1 1_7 ₽\	I
		Garland-Forshee et al. ³⁷	Het: 6.5	1.72 (1.22–2.42)	↓ 0.37 (0.18–0.74)	I
		*Diabetes ^{I,a}	Les: 10.8 Bi: 2.4	↑ 2.2 (0.6–7.8)	↓ 0.8 (0.4–1.6)	
		Han et al. ⁶⁰	Het: 16.9	↑ 1.07 (0.73–1.59)	↓ 0.58 (0.33–1.03)	I
			Les: 18.2 bi: 10.9 Lot: 10.3		0 60 /0 40 0 71)	
		*Diabetes ^{la}	пец. 10.3 Les: 7.8 Bi: 6.3	$\downarrow 0.97 (0.67 - 1.41)$	$\downarrow 0.81 (0.60-1.08)$	I
		McNair et al. ³⁸	Het: 0.3	\rightarrow	↑ 3.08 (0.41–22.94)	I
		*Diabetes (type 1) ^{I,d}	Les: 0 Bi: I		~	
		McNair et al. ³⁸	Het: 0.3	↑ 4.74 (0.63–35.42)	† 2.97 (0.40–22.05)	I
		*Diabetes (type 2) ^{I,d}	Les: 1.6 Bi: I			
		(type I and 2 aggregated for meta-analyses)				
		Diabetes ^{II,b}	Les: 9.3			
		Williams et al. ⁷³	Het: 16.7	↓ 0.90 (0.73–1.10)	↓ 0.87 (0.63–I.20)	I
		*Diabetes ^{I,b}	Les: 15.2 Bi: 14.8			
		Caceres et al. ³¹	Het: 4.1	I	I	↓ 0.64 (0.28–1.50)
		*Diabetes, exam. ^{I,e}	SMW: 2.7			↓ 0.90 (0.35–2.31)
		Caceres et al. ³¹	Het: 5.3	I	I	↑ 1.25 (0.68–2.28)
		Diabetes, sr. ^{I,e}	SMW: 6.5			↑ 1.82 (0.89–3.72)
		Eliason et al. ⁵⁴	Het: 4.9	I	I	↓ 0.59 (0.48–0.74)
		*Diabetes (type I or 2) ^{I,a}	SMW: 2.9			-
		Fredriksen-Goldsen et al. ⁵⁶	Het: 15.9	I	I	↓ 0.63 (0.43–0.95)
		Diabetes ^{1,a}	SMW: 10.6			\downarrow 0.77 (0.63-0.96)

Table 3. (Contin	ued)					
GBD Main category	GBD subcategory	Author(s), year of publication Health condition as indicated in reference, self-reported unless indicated otherwise	Prev. (%)	Lesbian women OR (95% CI) AOR (95% CI)	Bisexual women OR (95% CI) AOR (95% CI)	SMW OR (95% CI) AOR (95% CI)
		Matthews and Lee ⁶⁶ *Diabetes ^{1,b}	Het: 11.33 SMW: 4.3	I	I	↓ 0.40 (0.16–0.99) ↓ 0.55 (0.17–1.82)
		Beach et al. ⁴²	Het: 10.2	4 0.82 (0.63–1.05)	↓ 0.53 (0.42–0.68)	
		Diabetes (ex. Pred. and GD) ^{I,e}	Les: 8.5 Bi: 5.7	↑ 1.22 (0.76–1.95)	↓ 0.88 (0.62–1.26)	
		Fredriksen-Goldsen et al. ¹³	Het: 11.87	I	I	1.17 (0.91–1.51)
		Diabetes (ex. Pred. and GD)	SMW: 13.59			1.25 (0.96–1.64)
		Boehmer et al. ²⁶ Disheree ^{le}	Het: 5./ e: 4 58 Bi: 4 75	(+ 0.79 (0.61 - 1.03))	$\downarrow 0.73 (0.56-0.95)$	I
			Les. 7.Ju ul. 7.2J Het: 6.9	(0.0.1-0.0) (0.1 - (0.1 - (0.1 - 0.0)) (0.1 -	(02:1-4 (0) 01:1 1 0 36 (0 05-2 70)	I
		Diabetes ^{la}	Les: 2.2 Bi: 1.3	↓ 0.41 (0.06–2.95)	↓ 0.27 (0.02-4.80)	
		Hutchcraft et al. ⁶²	Het: 9.3	↓ 0.91 (0.50–1.65)	↓ 0.66 (0.29–1.51)	I
		Diabetes ^{I,a}	Les: 8.7 Bi: 6.8	↓ 0.97 (0.47–2.00)	↓ 0.73 (0.30–1.74)	
		Patterson and Jabson ⁶⁷	Het: 5.9 Les: 3.9	↓ 0.52 (0.13–2.15)	↓ 0.66 (0.34–1.31)	↓ 0.63 (0.34–1.17)
		Diabetes ^{l,a}	Bi: 3.9 SMW: 3.9	↓ 0.79 (0.21–2.91)	↑ 1.04 (0.45–2.40)	↓ 0.97 (0.50–1.89)
Digestive	Cirrhosis	Han et al. ⁶⁰	Het: 0.4	\rightarrow	↑ 4.10 (0.99–17.01)	I
diseases		Cirrhosis ^{I,a}	Les: 0 Bi: 2			
Maternal	M aternal disorders	Dibble et al. ⁵¹	Het: 24.10	↓ 0.86 (0.50–1.48)	1	I
and neonatal		Miscarriage (in ever pregnant women) ^{II,b}	Les: 21.36	-		
disorders		Dibble et al. ⁵²	Het: 78.07	↓ 0.80 (0.53–1.20)	I	I
		Miscarriage (in ever pregnant women) ^{II,b}	Les: 73.91			
Musculoskeletal	Arthritis (GBD:	Cochran and Mays ⁹	Het: 21.4	1.84 (0.99–3.41)	4 0.83 (0.36–1.91)	I
disorders	osteoarthritis and	Arthritis ^{I,a}	Les: 33.5 Bi: 17.7	T 2.02 (1.00–4.08)	T 1.40 (0.55–3.60)	
	rheumatoid arthritis, gout)	Boehmer et al. ²⁸	Het: 18.1	1.53 (I.34–I.73 🛉	↓ 0.97 (0.84–I.11)	I
		*Arthritis ^{I,c}	Les: 25.2 Bi: 17.64	↑ I.46 (I.05–2.03)	† 1.45 (1.09–1.93)	
		Garland-Forshee et al. ³⁷	Het: 31.4	1.64 (I.33–2.04)	4 0.59 (0.46–0.78)	I
		*Arthritis ^{l,a}	Les: 42.9 Bi: 21.4	1 2.0 (1.2–3.3)	T 1.4 (0.8–2.6)	
		Diamant and Wold ⁴⁹	Het: 14.7	1.76 (0.86–3.59)	↓ 0.66 (0.30–I.44)	I
		Arthritis ^{II.c}	Les: 23.3 Bi: 10.1	T 1.7 (0.8–3.7)	↓ 0.6 (0.3–1.4)	
		Diamant et al. ⁵⁰	Het: 21	↑ 1.72 (0.95–3.12)	↓ 0.75 (0.31–1.81)	1
		Arthritis"	Les: 31 Bi: 17			
		Fredriksen-Goldsen et al. ⁵⁵	Het: 30.72	T 1.15 (0.97–1.35)	+ 0.66 (0.54–0.81)	I
		Arthritis (several forms) ^{1,a}	Les: 33.67 Bi: 22.57	1.55	1.54	
		Gonzales and Henning-Smith ⁵⁸	Het: 31	↓ 0.93 (0.84–1.03)	↓ 0.59 (0.53–0.64)	1
		*Arthritis (several forms) ^{I.a}	Les: 29.5 Bi: 20.8	1.58 (1.30–1.91)	T 1.49 (1.24–1.80)	
		Kim and Fredriksen-Goldsen ⁶³	Het: 12.44	1 2.91 (I.48–5.74)	1 4.07 (2.39–6.93)	1
		Arthritis ^{I.a}	Les: 29.36 Bi: 36.74			
		Patterson and Jabson ⁶⁷	Het: 19 Les: 28.5	1.70 (0.98–2.96)	† 1.01 (0.72–1.42)	1.17 (0.87–1.56)
		*Arthritis ^{I,a}	Bi: 19.3 SMW: 21.4	↑ 1.88 (0.93–3.82)	↑ 1.76 (1.00–3.07)	1.79 (I.12–2.86)
		Fredriksen-Goldsen et al. ¹³	Het: 52.24	I	I	1.06 (0.83–1.36)
		*Arthritis ^{Le}	SMW: 53.7			T 1.29 (0.99–1.67)
						(Continued)

GED Minicritery GED uteration (1981) control (1985 c) Dentifyer (1981) control (1981 c) Dentifyer (1981 c) Dentif	I able J. (Lott	ninea					
$ \begin{array}{c cccc} Fer of (GD) (ow tack) & Fer 447 & - & - & - & - & - & - & - & - & - & $	GBD Main category	GBD subcategory	Author(s), year of publication Health condition as indicated in reference, self-reported unless indicated otherwise	Prev. (%)	Lesbian women OR (95% CI) AOR (95% CI)	Bisexual women OR (95% CI) AOR (95% CI)	SMW OR (95% CI) AOR (95% CI)
Bit of and red (and) in and red (and) (retransitive figure () retransitions figure () retransited () retransited () retransitions figure () retransitio			Fredriksen-Goldsen et al.⁵⁶ *Arthritis ^{Ia}	Het: 44.7 SMVV: 50.3	I	I	↑ 1.26 (0.98–1.61) ↑ 1.57 (1.32–1.88)
		Back nain (GBD: Iow hack		Hat: 144	1 77 /0 88_3 55)	12 LI 01-4 47)	
		pain and neck pain)	*Back problems ^{la}	Les: 23.3 Bi: 26.5	↑ 1.66 (0.80–3.43)	↑ 2.39 (1.10–5.20)	
Nooplanes Number of concert Low bloch pairs SMM 53 MM 54 MM 54 <thm 54<="" th=""> MM 54 MM 54</thm>		(meta-analysis: Figure 6)	Fredriksen-Goldsen et al. ⁵⁶	Het: 39.8			↑ 1.72 (1.34–2.20)
)	*Low back pain/neck pain ^{I.a}	SMW: 53			↑ 1.78 (1.46–2.17)
	Neoplasms	All kinds of cancer	Boehmer et al. ²⁸	Het: 8.04	↔ 1.00 (0.82–1.23)	↓ 0.80 (0.65–I.00)	
$ \begin{array}{llllllllllllllllllllllllllllllllllll$		(aggregated) (meta-analveis: Figure 7)	*Adult cancer ^{I,c}	Les: 9.06 Bi: 6.56	† 1.09 (0.81–1.47)	† 1.14 (0.80–1.61)	
Concerts Concerts Less 89 (R: 23) $1.16 (0.69 - 1.5)$ $1.20 (1.62 - 1.6)$ $2.60 (0.3 - 1.1)$ How concerts How concerts How concerts How concerts How concerts How concerts $1.27 (0.65 - 1.6)$ $2.03 (0.5 - 0.6)$ $2.03 (0.5 $			Gonzales and Zinone ⁵⁹	Het: 9.6	↓ 0.93 (0.72–1.19)	↓ 0.74 (0.52–I.04)	I
Han et al.			*Cancer ^{le}	Les: 8.9 Bi: 7.2	\uparrow 1.18 (0.90–1.55)	↑ 1.70 (1.16–2.48)	
Connect ¹⁰ Lere 112 Formet ¹⁰ Lere 112 Formet ¹⁰ Connect ¹⁰ Conne Connect ¹⁰ Conne<			Han et al. ⁶⁰	Het: 12.5	↑ 1.07 (0.69–1.67)	↑ 1.12 (0.67–1.88)	I
Methin et al. ³⁸ Her I.I. \uparrow 307 (0.74-127) \downarrow 0.05 (0.13-6.87) \neg "Cancerd" Patterson and Jabont" Her 7.1 Euc. \uparrow 0.04 (0.00-1.27) \downarrow 0.05 (0.13-6.87) \neg "Cancerd" Her 7.1 Euc. Her 7.2 Euc. \downarrow 0.04 (0.00-1.27) \downarrow 0.05 (0.03-1.16) \downarrow 0.06 (0.03-1.17) "Cancerd" Her 3.5 6 SNW: 5 \downarrow 0.04 (0.02-1.27) \downarrow 0.07 (0.045-1.07) \downarrow 0.04 (0.05-0.07) \downarrow 1.14 (0.04-1.27) "Cancerd (syams)" Her 1.17 Her 3.6 SNW: 2.3 \downarrow 0.03 (0.03-1.05) \downarrow 0.04 (0.35-0.07) \downarrow 1.14 (0.04-1.27) Simper et al." Her 1.17 Her 3.6 SNW: 2.3 \downarrow 0.37 (0.03-0.02) \downarrow 0.04 (0.35-0.07) \downarrow 1.14 (0.04-1.27) Simper et al." Her 1.17 Her 3.6 SNW: 2.3 \downarrow 1.12 (0.77-2.11) \downarrow 0.04 (0.35-0.08) \downarrow 0.04 (0.35-0.08) \downarrow 0.04 (0.35-0.08) \downarrow 1.14 (0.04-1.27) Simper et al." Her 1.17 \uparrow 1.12 (0.77-1.23) \downarrow 0.37 (0.05-0.09) \downarrow 0.14 (0.94-1.37) \square 1.14 (0.94-1.37) Simper et al." Her 1.17 \uparrow 1.23 (0.7-2.01) \downarrow 1.12 (0.77-1.23) \square 1.12 (0.77-1.23) \square 1.12 (0.77-1.23)			*Cancer ^{I,a}	Les: 13.2 Bi: 13.9	~		
$ \begin{array}{llllllllllllllllllllllllllllllllllll$			McNair et al. ³⁸	Het: I.I	↑ 3.07 (0.74–12.78)	↓ 0.95 (0.13–6.87)	I
Patterin Her 2.1 less 2.5 model Her 2.1 less 2.5 model Her 2.1 less 2.5 model $0.39 (0.67-1.4)$ $0.066 (0.38-1.1)$ $\mathcal{E}_{materin}$ B: 56.5 model B: 56.5 model B: 56.5 model $0.34 (0.62-0.5)$ $0.08 (0.42-1.6)$ $0.066 (0.38-1.1)$ $\mathcal{E}_{materin}$ B: 1.73 5 model B: 1.73 5 model $0.33 (0.60-0.5)$ $0.048 (0.32-0.4)$ $0.066 (0.38-1.1)$ $\mathcal{E}_{materin}$ Her 1.17 T 1.23 (0.72-2.11) $ \mathcal{E}_{materin}$ Her 1.17 T 1.23 (0.72-2.11) $ \mathcal{E}_{materin}$ Her 1.17 T 1.23 (0.72-0.13) $ \mathcal{E}_{materin}$ Her 5.7 $ 0.37 (0.70-0.95)$ $ \mathcal{E}_{materin}$ Her 5.1 Her 5.1 $ -$			*Cancer ^{I,d}	Les: 3.2 Bi: 1			
Carcer is and device to al. Bit S.S.SNW: 5 $0.24 (0.09-129)$ $1.086 (0.32-0.57)$ $0.086 (0.32-0.57)$ $0.086 (0.32-0.57)$ $0.086 (0.32-0.57)$ $0.064 (0.33-0.56)$ $0.01 (0.77-1.23)$ $0.037 (0.02-0.56)$ $0.064 (0.33-0.56)$ $0.01 (0.77-1.23)$ $0.038 (0.33-0.56)$ $0.01 (0.77-1.23)$ $0.058 (0.32-0.56)$ $0.01 (0.77-1.23)$ $0.058 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ $0.028 (0.32-0.56)$ <td></td> <td></td> <td>Patterson and Jabson⁶⁷</td> <td>Het: 7.2 Les: 2.9</td> <td>↓ 0.42 (0.10–1.73)</td> <td>↓ 0.79 (0.45–1.40)</td> <td>↓ 0.66 (0.38–1.14)</td>			Patterson and Jabson ⁶⁷	Het: 7.2 Les: 2.9	↓ 0.42 (0.10–1.73)	↓ 0.79 (0.45–1.40)	↓ 0.66 (0.38–1.14)
Sanders et al. ⁶ C-arce (5years) ¹⁰ Her 361 Jacs 275 0.05 (0.60–0.95) 0.048 (0.53–0.67) 0.644 (0.53–0.77) Singer et al. ⁷⁰ Her 1/7 Her 1/7 1.23 (0.72–2.11) $ -$			*Cancer ^{I,a}	Bi: 5.6 SMW: 5	↓ 0.34 (0.09–1.29)	↑ 1.08 (0.53–2.19)	↓ 0.84 (0.42–1.67)
*Cancer (5 years) ¹⁰ B: 1.79 StWr: 234 \uparrow (123 (0.72-2.11) \uparrow (114 (0.94-1.37) Simenson et al. ¹⁰ B:: 1.79 StWr: 234 \uparrow (123 (0.72-2.11) \uparrow (124 (0.94-1.37) Simenson et al. ¹⁰ Her: 1.7 \uparrow (123 (0.72-2.11) $ \uparrow$ (14 (0.94-1.37) Cancer ¹⁰ Her: 1.6 Her: 8.6 \downarrow (0.87 (0.53-0.87) \downarrow 0.037 (0.52-0.63) $-$ Singer et al. ¹⁰ Her: 8.6 \downarrow (107 (0.77-1.33) \downarrow 0.037 (0.62-0.95) $ -$ Singer et al. ¹⁰ Her: 1.46 \uparrow (101 (0.77-1.33) \downarrow 0.03 (0.33-0.35) $-$ Singer et al. ¹⁰ Her: 1.46 \uparrow 2.41 (0.81-7.23) \downarrow 0.05 (0.60-0.95) $ \uparrow$ 1.20 (0.92-1.56) Singer et al. ¹⁰ Her: 1.61 \uparrow (101 (0.77-1.33) \downarrow 0.05 (0.60-0.95) $ \uparrow$ 1.20 (0.92-1.56) Singer et al. ¹⁰ Her: 2.0 \uparrow (101 (0.77-1.33) \downarrow 0.05 (0.60-0.95) $ \uparrow$ 1.20 (0.92-1.56) Singer et al. ¹⁰ Her: 1.61 \downarrow (101 (0.77-1.33) \downarrow 0.05 (0.60-0.95) $ \uparrow$ 1.20 (0.92-1.56) Brown et al. ¹⁰ Her: 2.0 \uparrow (101 (0.77-1.34) \downarrow 0.05 (0.60-0.95) $-$			Saunders et al. ⁶⁸	Het: 3.63 Les: 2.75	↓ 0.75 (0.60–0.95)	4 0.48 (0.35–0.67)	↓ 0.64 (0.53–0.77)
Simeson et al. ⁶ Cancer e^{ab} Her. 11.7 Les: 14.1 $1.23 (0.72-2.1.1)$ - - Singer et al. ⁷⁰ Singer et al. ⁷⁰ *Cancer (ex. Skin C.) ^{4c} Her. 8.5 Les: 7.6 Bit S.1 $0.87 (0.79-0.96)$ $0.057 (0.52-0.43)$ - Singer et al. ⁷⁰ Singer et al. ⁷⁰ Singer et al. ⁷⁰ Singer et al. ⁷⁰ Sincencer d ¹¹⁶ Exercises (3) Her. 14.6 Les: 7.5 Bit (301-7.23) $0.037 (0.52-0.43)$ - - Sint cancer d ¹¹⁶ Singer et al. ⁷⁰ Sint cancer d ¹¹⁶ Exercises (3) Her. 14.6 Les: 7.33 $0.037 (0.52-0.33)$ - - - 1.20 (0.92-1.56) Sint cancer d ¹¹⁶ Brown et al. ⁶⁰ Cancer diagnosis (3)/sears) ¹¹⁴ Cancer diagnosis (3)/sears) ¹¹⁴ Her. 14.6 Her. 14.6 $7.241 (0.81-7.23)$ - - 1.12 (0.92-1.56) Brown et al. ⁶⁰ Cancer diagnosis (3)/sears) ¹¹⁴ Her. 2.0 Her. 2.0 $7.241 (0.81-7.23)$ - - 1.12 (0.92-1.56) Brown et al. ⁶⁰ Cancer diagnosis (3)/sears) ¹¹⁴ Her. 2.0 Her. 1.2 $1.00 (0.01-6.49)$ - - 1.12 (0.92-1.56) Brown et al. ⁶⁰ Cancer ¹¹⁶ Cancer ¹¹⁶ Mi shin cancer (HIS) ¹¹ Her. 2.0 Her. 2.0 $1.12 (0.07-6.43)$ - 1.12 (0.92-1.56) Concer diagnosis (3)/sears) ¹¹⁶ Her. 2.0 Her. 2.0 Her. 2.0 $1.12 (0.97-1.43)$ - 1.12 (0.92-1.56) -			*Cancer (5 years) ^{ı,b}	Bi: I.79 SMW: 2.34	х 7		↑ 1.14 (0.94–1.37)
Cancer ^(b) Cancer ^(b) Les: 14.1 Les: 14.1<			Simenson et al. ⁶⁹	Het: 11.7	↑ 1.23 (0.72–2.11)	I	Ι
Singer et al. ⁷⁰ Here 86 0.87 (0.79-0.96) 0.57 (0.52-0.63) - Cancer (Arc Sin C) ¹⁴ Here 67 Less 76 Bit 51 0.087 (0.79-0.97) 0.057 (0.52-0.03) - Singer et al. ⁷⁰ Here 67 Less 51 Bit 46 7.101 (0.77-1.33) 0.028 (0.23-0.035) - Singer et al. ⁷⁰ Here 14.6 7.241 (0.81-7.23) 0.028 (0.23-0.035) - Singer et al. ⁷⁰ Here 14.6 7.241 (0.81-7.23) 0.028 (0.23-0.035) - Reave and model Less 29.3 Less 29.3 - - 7 1.20 (0.92-1.56) Brown et al. ⁴⁰ Here 14.6 7.241 (0.81-7.23) 0.057 (0.53-0.035) - 1.20 (0.92-1.56) Record diagosis (3 years) ¹⁶ Here 771 -7.41 (0.81-7.24) 0.07 (0.57-1.53) - 7 1.20 (0.92-1.56) Roothmer et al. ⁴⁰ Here 1.7 0.75 (0.70-1.44) 1.11 (0.72-1.44) - 1.11 (0.72-1.57) - 1.11 (0.72-1.57) Cancer diagnosis (3 years) ¹⁶ Less 1.9 Bit 6.04 1.07 (0.79-1.44) 1.11 (0.70-1.44) - 1.11 (0.72-1.44) - 1.12 (0.92-1.56) - - -			Cancer ^{II,b}	Les: 14.1			
*Cancer (ex. Skin C.) ^{1c} Les: 7.6 Bi: 5.1 .			Singer et al. ⁷⁰	Het: 8.6	4 0.87 (0.79–0.96)	4 0.57 (0.52–0.63)	1
Singer et al."5 Sin carcer d_{m}^{16} Here 67 $0.068 (0.53-0.37)$ $0.028 (0.23-0.35)$ $-0.28 (0.23-0.32)$ $-0.28 (0.23-0.32)$ $-0.28 (0$			*Cancer (ex. Skin C.) ^{I.c}	Les: 7.6 Bi: 5.1	х 7	, ,	
Skin cancer d ¹¹⁶ Les: 61 Bit 4.6 \uparrow (.01 (0.77-1.33) \downarrow 0.75 (0.60-0.95) \neg Zaritsky and Dibble ⁷⁴ Her: 14.6 \uparrow (.01 (0.77-1.33) \downarrow 0.75 (0.60-0.95) \neg Breast cancer ¹¹⁶ Her: 14.6 \uparrow (.01 (0.77-1.33) \downarrow 0.75 (0.60-0.95) \neg Breast cancer ¹¹⁶ Her: 271 Her: 273 \neg \neg \uparrow (.00 (0.92-1.56) Browner et al. ⁴¹ Her: 771 \rightarrow 1.00 (0.81-1.24) \downarrow 0.67 (0.53-0.84) \neg \uparrow (.20 (0.92-1.56) Rommer et al. ⁴¹ Her: 771 \rightarrow 1.00 (0.81-1.24) \downarrow 0.67 (0.53-0.84) \neg \uparrow (.20 (0.92-1.56) Rommer et al. ⁴¹ Her: 771 \rightarrow 1.00 (0.81-1.24) \downarrow 0.67 (0.53-0.84) \neg Contran and Mays ⁶ Les: 8.59 Bit 6.04 \uparrow (.07 (0.79-1.43) \uparrow (.11 (0.78-1.57) \neg Cancer ^{1/4} Les: 10 Bit \downarrow (.07 (0.07-0.92) \downarrow 0.51 (0.44-0.59) \neg \neg Cancer ^{1/4} Her: 1.29 \downarrow (.07 (0.07-1.43) \uparrow (.051 (0.44-0.59) \neg \neg Cancer ^{1/4} \frown \downarrow (.07 (0.07-1.43) \downarrow 0.51 (0.44-0.59) \neg \neg \neg \neg \neg \neg </td <td></td> <td></td> <td>Singer et al.⁷⁰</td> <td>Het: 6.7</td> <td>4 0.68 (0.53–0.87)</td> <td>4 0.28 (0.23–0.35)</td> <td>Ι</td>			Singer et al. ⁷⁰	Het: 6.7	4 0.68 (0.53–0.87)	4 0.28 (0.23–0.35)	Ι
Zaritsky and Dibble ⁴⁴ Her: 146 $7.241 (0.81-7.23)$ Breast cancer ^(1b) Les: 29.3Les: 29.3 $7.241 (0.81-7.23)$ Breast cancer diagnosis (3 years) ^{1/4} Les: 30.7 $7.120 (0.92-11.56)$ Roohmer et al. ⁴⁴ Het: 771 $\leftrightarrow 1.00 (0.81-1.24)$ $\downarrow 0.67 (0.53-0.84)$ -Cancer (any kind) ^{1/b} Les: 859 Bi: 6.04 $7.107 (0.79-1.44)$ $7.111 (0.78-1.57)$ -Cochran and Mays ⁵ Het: 2.0 $7.105 (0.14-7.98)$ \downarrow -Cancer ^{1/4} Les: 19 Bi: 0 $\downarrow 0.76 (0.09-6.48)$ \downarrow -Cancer ^{1/4} Les: 0.9 Bi: 0 $\downarrow 0.76 (0.09-6.48)$ Diamate et al. ⁴⁵ Het: 1.0 $\downarrow 0.76 (0.09-6.48)$ Cancer ^{1/4} Les: 0.8 Bi: 0 $\downarrow 0.76 (0.09-6.48)$ Diamate et al. ⁴⁶ Het: 1.29 $\downarrow 0.77 (0.79-1.43)$ $\uparrow 1.11 (0.78-1.57)$ -Cancer ^{1/4} Les: 0.8 Bi: 0 $\downarrow 0.76 (0.09-6.48)$ Diamate et al. ⁴⁶ Het: 1.29 $\downarrow 0.76 (0.09-6.48)$ Diamate et al. ⁴⁶ Het: 1.29 $\downarrow 0.77 (0.79-1.43)$ $\uparrow 1.11 (0.78-1.57)$ Cancer ^{1/4} Les: 0.9 Bi: 7 $\uparrow 1.12 (0.87-1.43)$ $\uparrow 1.12 (0.97-1.23)$ Marsh et al. ⁴⁶ Het: 2.6 $\downarrow 0.57 (0.7-1.23)$ Marsh et al. ⁴⁶ Het: 2.6 $\downarrow 0.73 (0.14-2.03)$ Marsh et al. ⁴⁶ Het: 2.6 $\downarrow 0.77$			Skin cancer d. ^{III,e}	Les: 6.1 Bi: 4.6	↑ 1.01 (0.77–1.33)	4 0.75 (0.60–0.95)	
Breast cancer ¹⁰ Les: 29.3 Les: 29.3 $ \uparrow$ 1.20 (0.92-1.56) Brown et al. ⁴⁵ Brown et al. ⁴⁵ Her: 30.7 $ \uparrow$ 1.20 (0.92-1.56) Rown et al. ⁴⁵ Her: 7.71 \leftrightarrow 1.00 (0.81-1.24) \downarrow 0.67 (0.53-0.84) $ \uparrow$ 1.20 (0.92-1.56) Rown et al. ⁴⁶ Her: 7.71 \leftrightarrow 1.00 (0.81-1.24) \downarrow 0.67 (0.53-0.84) $ \uparrow$ 1.20 (0.92-1.56) Roentmer et al. ⁴⁰ Her: 7.71 \leftrightarrow 1.00 (0.81-1.24) \downarrow 0.67 (0.53-0.84) $ -$ <th< td=""><td></td><td></td><td>Zaritsky and Dibble⁷⁴</td><td>Het: 14.6</td><td>↑ 2.41 (0.81–7.23)</td><td>I</td><td>I</td></th<>			Zaritsky and Dibble ⁷⁴	Het: 14.6	↑ 2.41 (0.81–7.23)	I	I
Brown et al. ⁴⁵ Het: 30.7 - - ^ (1.20 (0.92-1.56)) *Cancer diagnosis (3 years) ^{1e} SNWY: 34.7 - - ^ (1.20 (0.92-1.56)) Boehmer et al. ⁴⁴ Het: 7.71 Het: 7.71 + (0.00 - 0.124) $0.67 (0.53-0.84)$ - - Cancer (any kind) ^{1b} Les: $8.59 Bi: 6.04$ $7.107 (0.79-1.44)$ $7.111 (0.78-1.57)$ - Constra and Manna et al. ⁵⁰ Het: 1.20 $0.05 (0.09-6.48)$ $-$ - Cancer (angnosis (3 years) ^{1/4} Les: $1.9 Bi: 0$ $7.076 (0.09-6.48)$ - - Diamant et al. ⁵⁰ Het: 1.20 $0.76 (0.09-6.48)$ $-$ - - Cancer ^{1/4} Les: $1.9 Bi: 0$ $ 0.76 (0.09-6.48)$ - - Diamant et al. ⁵⁰ Het: 1.20 $ -$ - - - Cancer ^{1/4} Het: 1.20 $ -$ - - - Cancer ^{1/4} Ease $1.9 Bi: 0$ $0.76 (0.09-6.48)$ $-$ - - - - - Cancer ^{1/4} Diamant et al. ⁵⁰ <			Breast cancer ^{II,b}	Les: 29.3			
*Cancer diagnosis (3years) ¹⁶ SMW: 34.7*Cancer diagnosis (3years) ¹⁶ Her. 7.71 $\leftrightarrow 1.00 (0.81-1.24)$ $\downarrow 0.67 (0.53-0.84)$ Boehmer et al.4Her. 7.71 $\leftrightarrow 1.00 (0.81-1.24)$ $\uparrow 0.67 (0.53-0.84)$ \neg Cancer (any kind) ¹⁰ Les: 8.59 Bi: 6.04 $\uparrow 1.07 (0.79-1.44)$ $\uparrow 1.11 (0.78-1.57)$ \neg Cancer diagnosis (3years) ¹⁶ Her. 2.0 $\uparrow 1.05 (0.14-7.98)$ \downarrow \neg \neg Cancer diagnosis (3years) ¹⁶ Her. 1 \downarrow \downarrow \neg \neg \neg Cancer ¹⁶ Les: 0.8 Bi: 0 $\downarrow 0.76 (0.09-6.48)$ \downarrow \neg \neg Cancer ¹⁶ Les: 0.8 Bi: 0 $\downarrow 0.79 (0.67-0.92)$ \downarrow \neg \neg Cancer ¹⁶ Les: 1.9 Bi: 7 $\downarrow 0.79 (0.67-0.92)$ \downarrow \neg \neg Cancer ¹⁶ Les: 1.0 Bi: 7 $\uparrow 1.12 (0.87-1.43)$ \neg \neg \neg Cancer ¹⁶ Her. 1.2.9 $\downarrow 0.79 (0.67-0.92)$ $\downarrow 0.51 (0.44-0.59)$ \neg Cancer ¹⁸ Her. 2.6 \neg \neg \neg \neg \neg Mansh et al.6Her. 2.6 \neg \neg \neg \neg \neg \neg Marsh et al.6Her. 3.1 $ \neg$ \neg \neg \neg \neg All skin cancers (NHIS) ^{III} SMW: 1.6 $ \neg$ \neg			Brown et al. ⁴⁵	Het: 30.7	I	I	↑ 1.20 (0.92–1.56)
Boehmer et al. ⁴ Her. 771 $\leftrightarrow 1.00 (0.81-1.24)$ $0.67 (0.53-0.84)$ $-$ Cancer (any kind) ^{1b} Les: 8.59 Bi: 6.04 $\uparrow .07 (0.79-1.44)$ $\uparrow .1.1 (0.78-1.57)$ $-$ Cochran and Mays ⁵ Her. 2.0 $\uparrow .07 (0.79-1.44)$ $\uparrow .1.1 (0.78-1.57)$ $-$ Cochran and Mays ⁷ Les: 1.9 Bi: 0 $\downarrow .0.7 (0.79-1.44)$ $\uparrow .1.1 (0.78-1.57)$ $-$ Cochran and Mays ⁷ Her. 2.0 $\uparrow .07 (0.79-1.44)$ $\uparrow .1.1 (0.78-1.57)$ $-$ Cochran and Mays ⁷ Les: 1.9 Bi: 0 $\downarrow .0.7 (0.09-6.48)$ $\downarrow -$ Cancer ¹⁶ Her. 1.1 $\downarrow \downarrow 0.76 (0.09-6.48)$ $\downarrow -$ Diamant et al. ⁵⁰ Her. 1.2.9 $\downarrow 0.76 (0.09-6.48)$ $\downarrow -$ Cancer ¹⁶ Her. 1.2.9 $\downarrow 0.76 (0.09-6.48)$ $\downarrow -$ Cancer ¹⁶ Her. 1.2.9 $\downarrow 0.76 (0.09-6.48)$ $\downarrow -$ Cancer ¹⁶ Her. 1.2.9 $\downarrow 0.76 (0.09-6.48)$ $\downarrow -$ Cancer ¹⁶ Her. 1.2.9 $\downarrow 0.79 (0.67-0.92)$ $\downarrow 0.51 (0.44-0.59)$ $-$ Marsh et al. ⁶⁵ Her. 2.6 $-$ <th< td=""><td></td><td></td><td>*Cancer diagnosis (3 years)^{I,e}</td><td>SMW: 34.7</td><td></td><td></td><td></td></th<>			*Cancer diagnosis (3 years) ^{I,e}	SMW: 34.7			
Cancer (any kind) ^{1b} Les: 8.59 Bi: 6.04 \uparrow 1.07 (0.79-1.44) \uparrow 1.11 (0.78-1.57) Cochran and Mays ⁹ Her: 2.0 \uparrow 1.05 (0.14-7.98) \downarrow $-$ Cochran and Mays ⁹ Her: 1 \downarrow \uparrow 1.05 (0.14-7.98) \downarrow $-$ Cancer diagnosis (3years) ^{1/e} Les: 1.9 Bi: 0 \downarrow 0.76 (0.09-6.48) \downarrow $-$ Cancer ^{1/e} Les: 0.81: 0 \downarrow 0.76 (0.09-6.48) \downarrow $-$ Cancer ^{1/e} Les: 0.81: 0 \downarrow 0.76 (0.09-6.48) \downarrow $-$ Cancer ^{1/e} Les: 0.81: 0 \downarrow 0.77 (0.79-1.43) \uparrow 1.12 (0.74-0.59) $-$ Cancer ^{1/a} Les: 10.4 Bi: 7 \uparrow 1.12 (0.87-1.43) \uparrow 1.25 (0.98-1.59) $-$ Mansh et al. ⁶⁵ Her: 2.6 $ -$			Boehmer et al. ⁴⁴	Het: 7.71	↔ 1.00 (0.81–1.24)	4 0.67 (0.53–0.84)	Ι
Cochran and Mays ⁹ Her: 2.0 \uparrow 1.05 (0.14-7.98) \downarrow $-$ Cancer diagnosis (3 years) ^{1/e} Less: 1.9 Bi: 0 \downarrow 0.76 (0.09-6.48) \downarrow $-$ Cancer ^{1/e} Less: 0.8i: 0 \downarrow 0.76 (0.09-6.48) \downarrow $-$ Cancer ^{1/e} Less: 0.8i: 0 \downarrow 0.76 (0.09-6.48) \downarrow $-$ Cancer ^{1/e} Less: 0.8i: 0 \downarrow 0.79 (0.67-0.92) \downarrow 0.51 (0.44-0.59) $-$ Cancer ^{1/a} Less: 10.4 Bi: 7 \uparrow 1.12 (0.87-1.43) \uparrow 1.25 (0.98-1.59) \downarrow 0.84 (0.57-1.23) Mansh et al. ⁶⁵ Her: 2.6 $ \downarrow$ 0.53 (0.14-2.03) Marsh et al. ⁶⁵ Her: 3.1 $ \downarrow$ 0.53 (0.14-2.03) All skin cancers (NHIS) ^{III} SMW: 1.6 $ \downarrow$ 0.53 (0.14-2.03)			Cancer (any kind) ^{I,b}	Les: 8.59 Bi: 6.04	↑ 1.07 (0.79–1.44)	↑ 1.11 (0.78–1.57)	
Cancer diagnosis (3 years) ^{1,e} Les: 1.9 B: 0 0.76 (0.09–6.48)Diamant et al.50Her: 1 \downarrow $D.76$ (0.09–6.48)Diamant et al.50Her: 1 \downarrow $U.76$ (0.09–6.48)Cancer ^{1/4} Less: 0 Bi: 0 \downarrow \downarrow $-$ Cancer ^{1/4} Less: 0.8i: 0 \downarrow \downarrow $J.25$ (0.44–0.59)Cancer ^{1/a} Less: 10.4 Bi: 7 \uparrow 1.12 (0.87–1.43) \uparrow 1.25 (0.98–1.59)Marsh et al. ⁶⁵ Her: 2.6 $ J.25$ (0.98–1.59)Marsh et al. ⁶⁵ Her: 3.1 $ J.0.53$ (0.14–2.03)All skin cancers (CHIS) ^{III} SMW: 2.3 $ -$ Marsh et al. ⁶⁵ Her: 3.1 $ J.0.53$ (0.14–2.03)All skin cancers (NHIS) ^{III} SMW: 1.6 $ -$ All skin cancers (NHIS) ^{III} SMW: 1.6 $ -$ <			Cochran and Mays ⁹	Het: 2.0	1.05 (0.14–7.98)	\rightarrow	I
Diamant et al. ⁵⁰ Her: I \downarrow \downarrow \downarrow $-$ Cancer ^{ILE} Less: 0 Bi: 0 \downarrow \downarrow \downarrow \downarrow $-$ Cancer ^{ILE} Less: 0 Bi: 0 \downarrow \downarrow \downarrow \downarrow \downarrow $-$ Cancer ^{ILE} Less: 10.4 Bi: 7 \uparrow \uparrow \downarrow \downarrow \downarrow $-$ Cancer ^{IA} Less: 10.4 Bi: 7 \uparrow \uparrow \uparrow \downarrow			Cancer diagnosis (3 years) ^{I,e}	Les: I.9 Bi: 0	↓ 0.76 (0.09–6.48)		
Cancer ^{IL2} Les: 0 Bi: 0 Cancer ^{IL2} Les: 0.8 Bi: 7 $0.79 (0.67-0.92)$ $0.51 (0.44-0.59)$ $-$ Gonzales and Henning-Smith ⁵⁸ Her: 12.9 $0.79 (0.67-0.92)$ $0.51 (0.44-0.59)$ $-$ Cancer ^{1A} Les: 10.4 Bi: 7 $7 1.12 (0.87-1.43)$ $7 1.25 (0.98-1.59)$ $ 0.84 (0.57-1.23)$ Mansh et al. ⁶⁵ Her: 2.6 $ 0.84 (0.57-1.23)$ Marsh et al. ⁶⁵ Her: 2.6 $ -$ <th< td=""><td></td><td></td><td>Diamant et al.⁵⁰</td><td>Het: I</td><td>\rightarrow</td><td>\rightarrow</td><td>I</td></th<>			Diamant et al. ⁵⁰	Het: I	\rightarrow	\rightarrow	I
Gonzales and Henning-Smith ⁵⁸ Her: 12.9 \downarrow 0.79 (0.67–0.92) \downarrow 0.51 (0.44–0.59) $-$ Cancer ^{1.a} Les: 10.4 Bi: 7 \uparrow 1.12 (0.87–1.43) \uparrow 1.25 (0.98–1.59) $-$ 0.84 (0.57–1.23) Mansh et al. ⁶⁵ Her: 2.6 $ -$ <			Cancer ^{II,c}	Les: 0 Bi: 0			
Cancer ^{1,a} Les: 10.4 Bi: 7 7.1.12 (0.87-1.43) 7.1.25 (0.98-1.59) Mansh et al. ⁶⁵ Her: 2.6 - - 0.84 (0.57-1.23) All skin cancers (CHIS) ^{III} SMW: 2.3 - - - - - 0.84 (0.57-1.23) Mansh et al. ⁶⁵ Her: 3.1 - - - - - - 0.53 (0.14-2.03) All skin cancers (NHIS) ^{III} SMW: 1.6 - - - - - - - - - - - - - - - 0.53 (0.14-2.03) -			Gonzales and Henning-Smith ⁵⁸	Het: 12.9	↓ 0.79 (0.67–0.92)	↓ 0.51 (0.44–0.59)	I
Mansh et al. ⁶⁵ Her: 2.6 - - \$ 0.84 (0.57-1.23) All skin cancers (CHIS) ^{III} SMW: 2.3 - - \$ 0.84 (0.57-1.23) Mansh et al. ⁶⁵ Her: 3.1 - - \$ 0.53 (0.14-2.03) All skin cancers (NHIS) ^{III} SMW: 1.6 - - \$ 0.53 (0.14-2.03)			Cancer ^{I,a}	Les: 10.4 Bi: 7	↑ 1.12 (0.87–1.43)	1.25 (0.98–1.59) ↑	
All skin cancers (CHIS) ^{III} SMW: 2.3 Musicancers (CHIS) ^{III} SMW: 2.3 Het: 3.1 – – – – – – – – – – – – – – – – – – –			Mansh et al. ⁶⁵	Het: 2.6	I	I	↓ 0.84 (0.57–1.23)
Mansh et al. ⁶⁵ Her: 3.1 - - ↓ 0.53 (0.14-2.03) All skin cancers (NHIS) ^{III} SMW: 1.6 - ↓ 0.53 (0.14-2.03) - ↓ 0.53 (0.14-2.03) - ↓ 0.53 (0.14-2.03) - ↓ 0.53 (0.14-2.03) - ↓ 0.53 (0.14-2.03) - ↓ 0.53 (0.14-2.03) - ↓ 0.53 (0.14-2.03)			All skin cancers (CHIS) ^{III}	SMW: 2.3			
All skin cancers (NHIS) ^{III} SMW: 1.6			Mansh et al. ⁶⁵	Het: 3.I	I	I	🔶 0.53 (0.14–2.03)
			All skin cancers (NHIS) ^{III}	SMW: 1.6			

Table 3. (Contin	ued)					
GBD Main category	GBD subcategory	Author(s), year of publication Health condition as indicated in reference, self-reported unless indicated otherwise	Prev. (%)	Lesbian women OR (95% CI) AOR (95% CI)	Bisexual women OR (95% CI) AOR (95% CI)	SMW OR (95% CI) AOR (95% CI)
		Williams et al. ⁷³ Breast cancer ^{lb}	Het: 5 Les: 5.5 Bi: 3.4	↑ 1.11 (0.81–1.53)	↓ 0.68 (0.36–I.27)	1
Neurological	Headache disorders	Heslin ⁶¹	Het: 19.8	I	I	† 1.23 (1.12–1.35)
disorders	(meta-analysis: Figure 8)	Severe headaches/migraines"	SMW: 23.3			
		Strutz et al. ⁷² *Mirroine hondrohoole	Het: 19.8 SM\M: 20.4	I	I	1.61 (1.16–2.24)
		Cochran and Mave ⁹	ытүү. 20.т Нег. 19 I	↑ 0 98 (0 47–2 05)	↑ 1 51 (0 72–3 17)	(11.7-11.1) cc.1 -
		*Migraines or headaches ^{la}	Les: 18.4 Bi: 26.4	↑ 1.22 (0.57–2.62)	↑ 1.75 (0.82–3.74)	
Nutritional	Dietary iron deficiency	McNair et al. ³⁸	Het: 15.4	↓ 0.80 (0.38–1.69)	↑ 1.46 (0.90–2.38)	I
deficiencies		Low iron ^{ld}	Les: 12.7 Bi: 21			
Other infectious	(Acute) Hepatitis	Han et al. ⁶⁰	Het: I.4	↑ 1.67 (0.61–4.54)	↑ 3.61 (1.57–8.30)	I
diseases	(meta-analysis: Figure 9)	*Hepatitis B/C ^{I,a}	Les: 2.3 Bi: 4.9	~		
		McNair et al. ³⁸	Het: 0.2	\rightarrow	↑ 20.68 (6.79–63.02)	1
		*Hepatitis B/C ^{I,d}	Les: 0 Bi: 4			
		Operario et al. ³⁶	Het: 1.2	I	I	† 3.91 (2.27–6.74)
		*Hepatitis C antibody, exam. ^{I,a}	SMW: 4.6			↑ 2.99 (I.33–6.73)
Other non-	Gynecological diseases	Agrawal et al. ²⁶	Het: 14	† 3.79 (2.57–5.60)	I	·
communicable		PCOS, exam. ^{II,c}	Les: 38			
diseases		Agrawal et al. ²⁶	Het: 6.8	↓ 0.79 (0.40–1.55)	I	I
		Fibroids ^{II,c}	Les: 5.6			
		Agrawal et al. ²⁶	Het: 3.39	↑ 1.08 (0.45–2.60)	I	I
		Endometriosis ^{II,c}	Les: 3.65			
		McNair et al. ³⁸	Het: 3.4	↓ 0.46 (0.06–3.35)	↓ 0.59 (0.14–2.39)	1
		Endometriosis ^{l,d}	Les: 1.6 Bi: 2			
		DeSutter et al. ⁴⁸	Het: 8.7	↓ 0.91 (0.41–2.04)	Ι	Ι
		PCOS, exam. ^{II,b}	Les: 8			
		Smith et al. ⁷¹	Het: 4.1	↑ 1.99 (0.59–6.69)	I	1
		PCOS, exam. ^{I,b}	Les: 7.9			
	Oral disorders	Schwartz et al. ³⁹	Het: 28.88	† 2.22 (I.I7–4.2I)	↑ I.49 (I.01–2.20)	1
		Periodontitis ^{II,d}	Les: 47.37 Bi: 37.72			
	Urinary diseases	McNair et al. ³⁸	Het: 17.7	↓ 0.40 (0.16–1.00)	↑ 1.81 (1.16–2.81)	I
		Urinary tract infections ^{I,d}	Les: 7.9 Bi: 28			
Skin and	Acne vulgaris	Agrawal et al. ²⁶	Het: 9.8	1 3.89 (2.5 I–6.02)	I	I
subcutaneous		Acne ^{ll,c}	Les: 30			
diseases						

Table 3. (Continued)
GBD: Global Burden of Disease; Prev.: prevalence; OR: odds ratio; AOR: adjusted odds ratio; CI: confidence interval; Het: heterosexual-identified women; Les: lesbian-identified women; Bi: bisexual-identified women; Bisexual-identified women; Bisexual-identified women; Bi: bisexual-identified women; Bisexual-identified women; Bi: bisexual-identified women; Bisexual-identified women; Bisexual-identified women; Bisexual-identified women; Bisexual-identified women;
 CR calculated from received primary data (author-request). COR calculated from weighted percentages. COR calculated from unweighted percentages. Wueighted percentage. "In Seast and her can a construction of the construction of the construction".
Significant differences (ORs, AORs) in bold letters. Hypertensive heart diseases : partial overlaps in: CHIS: Boehmer et al., ²⁸ years: 2001, 2003, 2005, 2007, Cochran and Mays, ⁹ years: 2004, 2005, Eliason et al., ⁴⁹ years: 2003, 2005, 2007, 2009, 2014; NHIS: Hutchcraft et al., ²³ years: 201–2018, and Volstein et al., ⁴¹ years: 2014, 2005, Eliason et al., ⁴¹ years: 2013–2018 (subsample of breast cancer patients) and Williams et al., ⁷³ years: 101–17; WBRFSS: Dilley et al., ³³ years: 2003–2006 and Fredriksen-Goldsen et al., ¹³ years: 2003, 2005, 2007, 2009, 2010; meta-analysis on hypertension: ORs included in meta-analysis with minor deviations due to calculation from reported percentages of original papers in the following cases: Caceres et al., ⁴¹ years: 2013–2018 & WBFRSS: Blosnich et al., ⁴³ years: 2013–2014, Hutchcraft et al., ⁴³ years: 2003, 2005, 2007, 2009, 2010; meta-analysis on hypertension: ORs included in meta-analysis with minor deviations due to calculation from reported percentages of original papers in the following cases: Caceres et al., ⁴¹ Fredriksen-Goldsen et al., ¹³ and Strutz et al. ⁷³ years: 2003, 2007, 2009, 2007, 2009, 2007, 2009, 2010.
2009, 2010 and Kum & Fredriksen-Goldsen et al., ⁴⁵ years: 2011, 2004, 2003, 2004, 2003, 2004, 2005, 2004, 2005, 2004, 2005, 2004, 2005, 2004, 2005, 2004, 2005, 2004, 2005, 2004, 2005, 2004, 2005, 2004, 2005, 2005, 2007, 2
2009, 2010; CHIS: Boehmer et al. ¹³ years: 2001, 2003, 2007, Cochran & Mays. ³ years: 2004, 2005 and Eliason et al. ¹³⁴ years: 2001, 2004, 2005, 2007, 2009, 2011–2012; NHANES: Caceres et al. ¹³¹ years: 2001–2012 and Patterson and justom, ⁶⁷ years: 2009–2014; NHS: Fredriksen-Goldsen et al. ¹⁵⁶ years: 2013, 2018, USI (subsamble of breast cancer patients) and Williams et al. ¹⁷³ years: 2013–2017; meta-analysis on Diabetes: ORs included in meta-analysis with minor deviations due to calculation from reported percentages of original papers in the following case: Caceres et al. ¹¹⁷ years: 2013–2017; meta-analysis on Diabetes: ORs included in meta-analysis with minor deviations due to calculation from reported percentages of original papers in the following case: Caceres et al. ¹¹⁷ years: 2003, 2005, 2007, 2009, Fredriksen-Goldsen et al. ¹⁸ years: 2005, 2007, 2009, Fredriksen-Goldsen et al. ¹⁸ years: 2005, 2007, 2009, Fredriksen-Goldsen et al. ¹¹⁸ years: 2003, 2005, 2007, 2009 (Hisparit cancer patients) and Williams et al. ¹⁸ years: 2009, Fredriksen-Goldsen et al. ¹¹ years: 2003, 2005, 2007, 2009 (Hisparit cancer patients) and Williams et al. ¹⁸ years: 2009, Fredriksen-Goldsen et al. ¹¹⁸ years: 2003, 2005, 2007, 2009 (Hisparit concord)
Neoplasms: partial overlaps (all kinds of cancer) in: BRFSS: Gonzales and Henning-Smith, ⁸⁶ years: 2014–2015 and Singer et al., ⁷⁰ years: 14–18; CHIS: Boehmer et al., ⁴⁴ years: 2001, 2003, 2005, Boehmer et al., ²⁴ years: 2001, 2003, 2005, Boehmer et al., ²⁴ years: 2001, 2003, 2005, and Mansh et al., ²⁵ years: 2001, 2005, 2007, Cochran and Mays, ³ years: 2004, 2005, and Mansh et al., ⁴⁵ years: 2001–2005; NHIS: Gonzales & Zinone, ³⁷ years: 2013–2016, Mansh et al., ⁴⁵ years: 13–17; meta-analysis on Neoplasms: ORs 2005, 2007, Cochran and Mays, ³ years: 13–17; meta-analysis on Neoplasms: ORs included in meta-analysis with minor deviations due to calculation from reported percentages of original papers in the following case: Gonzales and Zinone. ³⁹

Haarmann et al.

Regarding diabetes, meta-analysis (Figure 5) indicated an overall significant effect across subgroups: overall, SMW were almost 25% less likely to suffer from diabetes than heterosexual women (OR = 0.77 (95% CI = 0.66 - 0.91), p=0.002, $I^2=69\%$). Also, the test for subgroup differences reached significance ($\chi^2 = 7.63$, df=2, p=0.02): on the subgroup level, significant differences were not found for lesbian (OR=0.91 (95% CI=0.72-1.15), p=0.44), but only for bisexual (OR=0.72 (95% CI=0.56-0.93), p=0.01, $I^2 = 63\%$) and SMW compared to heterosexual women $(OR=0.58 (95\% CI=0.48-0.72), p < 0.00001, I^2=0\%).$ However, when looking at the three studies, that explicitly excluded prediabetes and gestational diabetes13,42,52 (studies have the same sample source (BRFSS), but only minor overlaps in years of data collection (Table 3)), the overall result is less distinctive: with five ratios ≥ 1 and five ratios ≤ 1 (one significant result each), the findings are equally balanced in either direction. Heterogeneity for diabetes, again, was higher in meta-analysis across subgroups than within subgroups (except for lesbian women).

Digestive diseases

Only one study on digestive diseases (i.e. cirrhosis) was found demonstrating no significant differences by sexual identity.⁶⁰

Maternal and neonatal disorders

The two studies (from the same authors) dealing with miscarriages did not find significant differences.^{50,51}

Musculoskeletal disorders

Meta-analysis on arthritis (Supplementary Figure S3) across subgroups found no significant effect (OR=1.04 (95% CI=0.82–1.33), p=0.73, $I^2=96\%$). Likewise, the meta-analyses within subgroups did not indicate significant differences by sexual identity (lesbian women: OR=1.38 (95% CI=0.98–1.94), p=0.07, $I^2=94\%$; bisexual women: OR=0.76 (95% CI=0.55–1.04), p=0.09, $I^2=93\%$). For arthritis, single results diverged considerably, resulting in high heterogeneity. However, two non-significant trends can be observed: overall, prevalence of arthritis tends to be slightly higher in lesbian women than in heterosexual women, and, in contrast, prevalence in bisexual women.

Meta-analysis on back pain (Figure 6) found a significant overall effect of higher prevalence of back pain in sexual minority compared to heterosexual women across the subgroups (OR=1.76 (95% CI=1.41-2.20), p < 0.00001, $I^2 = 0\%$). There were not enough studies to perform meta-analyses within subgroups. However, single results showed that SMW were about twice as likely and bisexual women about 70% as likely to suffer from

back pain than heterosexual women. In contrast, the difference between lesbian and heterosexual women was not significant.

Neoplasms

Meta-analysis on cancer (Figure 7) indicated an overall significant effect across subgroups: Overall, SMW were approximately 17% less likely to suffer from cancer than heterosexual women (OR=0.83 (95% CI=0.70–0.98), p=0.02, l^2 =83%). However, this difference was not found for lesbian (OR=0.90 (95% CI=0.80–1.00), p=0.06, l^2 =28%), but only for bisexual women, who were about 30% less likely to have had cancer than heterosexual women (OR=0.69 (95% CI=0.56–0.84), p=0.0003, l^2 =67%). The differences on the subgroup level were also reflected by the significance of the test for subgroup differences (χ^2 =11.02, df=2, p=0.0004). There was only one study on SMW, indicating no significant difference (OR=1.20 (95% CI=0.92–1.56), p=0.18). Again, heterogeneity for cancer was the highest in meta-analysis across subgroups compared to within subgroups.

Neurological disorders

Regarding neurological disorders, comparisons were only found for headache disorders: meta-analysis (Figure 8) showed a significant overall effect indicating higher prevalence of headache disorders in sexual minority compared to heterosexual women across subgroups (OR=1.54 (95% CI=1.26–1.88), p < 0.0001, $l^2=0\%$). There were not enough studies to perform meta-analyses within subgroups. However, the two studies comparing SMW and heterosexual women consistently showed significantly higher prevalence ratios for SMW for both severe headaches/migraines⁶¹ and migraine headaches.⁷²

Nutritional deficiencies

A single study concerned with low iron did not find significant differences.³⁸

Other infectious diseases

Meta-analysis (Figure 9) on hepatitis revealed a significant overall effect indicating higher prevalence of hepatitis in sexual minority compared to heterosexual women across subgroups (OR=4.43 (95% CI=2.06–9.52), p=0.0001, $l^2=66\%$). Meta-analysis within subgroups showed that bisexual women were significantly over eight times more likely to suffer from hepatitis than heterosexual women (OR=8.32 (95% CI=1.42–48.76), p=0.02, $l^2=85\%$). However, for lesbian women, meta-analysis did not show a significant difference (OR=1.83 (95% CI=0.71–4.69), p=0.21, $l^2=0\%$). Especially with regard to bisexual women, large confidence intervals and high heterogeneity were found.

Other non-communicable diseases

With one exception (one study found that prevalence of polycystic ovarian syndrome (PCOS) was about three times higher in lesbian women),²⁶ no further significant differences were revealed for neither lesbian nor bisexual women compared to heterosexual women concerning gynecological conditions (fibroids,²⁶ endometriosis,^{26,38} PCOS).^{47,71}

Regarding oral disorders, we found one study on periodontitis that showed significantly higher prevalence in both lesbian and bisexual compared to heterosexual women.³⁹ There was one study examining urinary diseases: bisexual women were significantly almost twice as likely as heterosexual women to suffer from urinary tract infections (UTIs), whereas lesbian women were non-significantly less likely to have UTI.³⁸

Skin and Subcutaneous diseases

The one study that was found on skin and subcutaneous diseases showed that lesbian women were significantly more than three times as likely to have acne as heterosexual women.²⁶

Risk of bias

Detailed CASP checklist results are provided in Supplementary Table S3. Overall, since 86.67% (39/45) of the included samples rely on large representative health surveys, risk of bias can be considered low.

Comparison of AORs and ORs

Apart from CASP checklist results, one notable result was the considerably greater share of AORs (compared to ORs) indicating higher prevalence in SMW than in heterosexual women across all categories (except for the category diabetes and chronic kidney diseases) (Supplementary Table S2). Particularly large differences (ORs vs AORs) were found for CVDs, musculoskeletal disorders, and neoplasms. This finding suggests that older, financially disadvantaged, and less educated SMW may have been underrepresented in some samples since most common variables adjusted for were age, income, and education (Supplementary Table S1).

Discussion

Discussion of main findings

The aim was to provide a comprehensive systematic review on the prevalence of physical health conditions, comparing lesbian or/and bisexual women or SMW (lesbian and bisexual aggregated) to heterosexual women.

The main results are as follows: (1) most striking differences by sexual identity were found for chronic respiratory diseases, particularly asthma: overall, SMW across all subgroups and in almost all studies were significantly 1.5-2 times more likely to suffer from asthma and other chronic respiratory diseases than heterosexual women; (2) evidence of higher prevalence in sexual minority compared to heterosexual women was also found regarding back pain, headaches/migraines, hepatitis B/C, oral disorders, urinary tract infections, and acne; (3) in contrast, lower prevalence in sexual minority compared to heterosexual women was found for heart attacks, hypertension, diabetes, and cancer; (4) concerning strokes, chronic kidney diseases and digestive diseases, maternal and nutritional disorders, sexual minority, and heterosexual women were about equally affected; (5) across categories, we found a trend of bisexual women being more affected than lesbian women by some of the stress-related conditions, such as asthma and headache disorders; and (6) some of the findings rely on only a few comparisons or small samples of SMW.

Findings on asthma are consistent with a previous systematic review (overall higher odds of similar magnitudes),¹⁷ underscoring the robustness of the effect sizes. Previous research has emphasized the importance of psychosocial stress on asthma: interpersonal stress as well as divorce/separation was shown to have strong associations with asthma.⁷⁷ Non-heterosexual identity and the associated risk of being discriminated against or offended, interpreted as a psychosocial stressor, has to be considered a risk factor for asthma. As mentioned before, a previous metaanalysis concluded that discrimination is associated with mental and physical health both *directly* as well as *indi*rectly via heightened stress responses and participation in unhealthy behaviors.¹¹ Smoking, known to be an unhealthy behavior more common in sexual minority than in heterosexual individuals,^{13,78} might be a further mediating factor regarding respiratory conditions: a representative study found that minority stressors were independently associated with a higher likelihood of current smoking in US sexual minority adults.⁷⁹ Another systematic review of the etiology of tobacco disparities for sexual minorities identified risk factors for smoking that might be considered unique to sexual minorities, including internalized homophobia and reactions to sexual orientation disclosure.⁸⁰ In addition, environmental injustice may also contribute: a cross-sectional study found respiratory risk from hazardous air pollutants was nearly 25% greater for same-sex than for heterosexual partners, most likely due to the higher likelihood of sexual minority individuals to live in inner-city neighborhoods with more severe air pollution.⁸¹

As mentioned before, previous research has identified psychosocial stress as a risk factor for asthma. Similar mechanisms might explain the overall greater odds for SMW to suffer significantly more from back pain as well as headaches/migraine. For lower back pain, harassment, discrimination,⁸² social isolation as well as social conflicts and perceived long-term stress⁸³ have been found to be relevant psychosocial risk factors. Previous research indicated that in women in general, lower perceived social status (including self-rated standing in community) is linked to heightened odds of migraines.³³ Due to sexual minority group status, lesbian- and bisexual-identifying women may perceive their social status as lower, increasing their risk for headaches/migraines. In addition, it has also been shown that SMW are at risk of having a lower socioeconomic status.⁸⁴ Similar to asthma, the likelihood of headache/ migraine has also been found to be elevated due to adverse life circumstances.85,86 Severe mental illness-at least partially-accounted for the excess burden of severe headaches and migraines among SMW in one of the included studies,⁶¹ providing empirical evidence for Lick et al.1 minority stress model, which includes psychological stress responses as a mediating factor for physical health disparities.

Although hypertension as well as diabetes are also known to be stress-related diseases, we found lower prevalence of hypertension and diabetes in SMW compared to heterosexual women. However, it should be noted that for diabetes, differences in prevalence could not be found in those studies that explicitly excluded prediabetes and gestational diabetes. Up to 10% of all pregnant women develop gestational diabetes during pregnancy (with 50% of those subsequently developing diabetes type 2).⁸⁷ Since previous studies showed that heterosexual women are pregnant considerably more often than non-heterosexual women,⁸⁸ this might explain the greater odds of diabetes for heterosexual women, when diabetes assessment includes gestational diabetes.

Hypertension is even more likely to occur during pregnancy: it is estimated that up to 13% of all pregnant women develop hypertension during pregnancy^{89,90}. The only study that collected data on hypertension *during* and *other* than pregnancy separately, accordingly found heterosexual women to have considerably higher prevalence of hypertension *during* pregnancy, but in contrast, for lesbian women, the ORs for hypertension *other than* pregnancy were (non-significantly) 1.5 times higher.³⁸ This evidence challenges the overall findings of greater odds for hypertension in studies aggregating both forms of hypertension, especially since meta-analyses found that pregnancy is almost 90% less likely for lesbian and 50% less likely for bisexual women compared to heterosexual women.⁸⁸

We found evidence that bisexual women have lower prevalence of cancer compared to heterosexual women. The median age at cancer diagnosis is 66 years⁹¹ (and about 50–60 years for hypertension⁹² and diabetes),⁹³ whereas, for example, asthma can occur throughout the entire lifespan, often as early as childhood and adolescence.⁹⁴ A similar pattern is known for headaches and migraines (average onset at younger ages).⁹⁵ Since older sexual minority adults are particularly hard to reach and, therefore, might be underrepresented in various studies, there is a higher risk of bias in diseases whose likelihood of occurrence increases with age. This assumption is supported by another finding: studies examining only older adults (\geq 50 years) in many cases were the only studies showing (significantly) higher prevalence in SMW regarding some of the diseases (cancer,^{45,60} heart attack,⁵⁶ stroke).⁵⁶ The differences in average age of onset may explain why more pronounced differences were found for some diseases as opposed to others. This especially applies to unweighted samples and (A)ORs not adjusted for age. Since we found hints that older, financially disadvantaged, and less educated SMW may have been underrepresented in some samples (comparisons of AORs and ORs), prevalence rates might be (even) higher in SMW in several cases. The fact that disparities between AORs and ORs were the largest for CVDs, musculoskeletal disorders, and neoplasms, which are diseases typically known for later onsets, strongly supports this hypothesis.

Socioeconomic status, lower income levels, and limited health insurance might have impacted some results found: previous studies have shown that SMW are at risk of having a lower socioeconomic status,⁸⁴ and sexual minority individuals have poorer access to healthcare as well as less insurance coverage (in the USA).¹⁵ There is ample research that these factors adversely affect health outcomes,^{96,97} underscoring their possible impact on results that were not adjusted for these factors.

There are hints from previous studies that there are higher mean testosterone levels in sexual minority compared to heterosexual women,^{98,99} which might be a reason for the elevated acne rates in lesbian compared to heterosexual women. However, it has to be considered that a systematic review on sex hormone levels in lesbian, bisexual, and heterosexual women concluded that data are too scarce to make definitive statements regarding differing hormone levels by sexual identity.⁹⁸

Across categories, we found a trend of bisexual women being more affected than lesbian women by some of the stress-related conditions (e.g. asthma, back pain, headache disorders). In their review on bisexuality, minority stress, and health, Feinstein and Dyar demonstrate¹⁰⁰ how research consistently found bisexual individuals to have more mental health problems compared to monosexual individuals.^{2,29,101,102} For example, bisexual individuals were more than four times more likely to have seriously considered suicide than gay, lesbian, or heterosexual individuals.¹⁰¹ Although all sexual minority individuals face the risk of discrimination and hostility; bisexual individuals experience unique stressors that can impose an additional burden.¹⁰⁰ They are frequently confronted with negative attitudes from multiple sources since both heterosexual as well as gay/lesbian individuals may have resentments against them (e.g. denial of legitimacy of bisexuality as a valid and stable sexual identity, refusal of (intimate) relations with bisexual people).¹⁰⁰ Therefore, safe spaces of belonging and full acceptance

may be more difficult to find, resulting in more pronounced minority stress¹⁰⁰ which in turn may manifest in more physical health conditions among bisexual women, as found in this systematic review with regard to some of the stress-related conditions.

Limitations

To minimize loss of information, we chose to include both weighted and unweighted data in the systematic review, which may reduce comparability to some extent. However, in order to rely on the most representative data available in the statistical summaries, only weighted data were included in the meta-analyses.

Furthermore, the vast majority of reported comparisons rely on self-reports only. The one study³¹ that included comparisons of both self-reported and examination-based diagnoses revealed that self-reported and examination-based diagnoses may vary. Since sexual minority individuals are likely to have poorer access to healthcare,¹⁵ they are more likely to be underdiagnosed and hence to report fewer diagnoses.

Regarding cancer, four studies^{65,70,73,74} gave specific information on the type of cancer (breast cancer,^{73,74} skin cancer^{65,70}), the remaining studies reported a pooled cancer category.^{9,28,38,44,45,50,58-60,67-70} Hence, in the meta-analysis, different cancer types were aggregated, and therefore, the results should be interpreted with caution.

The studies included data only on lesbian, bisexual, and heterosexual women. However, data on, for example, pansexual, queer, or asexual women were not considered. Therefore, our review is limited to some SMW and does not cover the full diversity of SMW who are at risk for health disparities.

Post data-analysis evaluation revealed that the databases CINAHL and CENTRAL did not yield additional hits beyond those in the other databases. Consequently, the search strategy is updated for follow-up projects, also with regard to sexual identity.

Finally, 39 (of 44) included studies were from the United States, and the other five also stem from Western, industrialized countries (the United Kingdom, Australia, Belgium). The generalizability is therefore limited to a few parts of the world.

Strengths

To the best of our knowledge, this is the most comprehensive systematic review on physical health conditions in lesbian- and/or bisexual-identified compared to heterosexual women. The very detailed search string and utilization of five databases yielded a high number of studies, so there is a high probability that we found the vast majority of relevant studies. In addition, we requested data from authors to work with the most accurate primary data possible. We are aware that classifications of diseases always remain arbitrary to some degree. However, using the GBD classification, we relied on a classification established by globally renowned health institutions (WHO, Harvard University) and therefore probably represent one of the most solid common grounds globally.

Regardless of dimension (identity/attraction/behavior), each individual with a minoritized sexual orientation is prone to experience minority stress. However, due to both self-perception and perception of society, the degree of minority stress may vary depending on the dimension of sexual orientation. In the framework of Lick et al.,¹ varying levels of minority stress may affect an individual's mental and physical health. To be as systematic as possible, we therefore considered different dimensions of sexual orientation as distinct units of analysis. Hence, we concentrated on one of them (identity), enhancing the precision of our findings.

Furthermore, the vast majority of samples rely on large, representative health surveys providing a solid database. The sampling weights used to account for the complex survey designs in most studies increase the likelihood of a racially and ethnically diverse sample rather than an almost entirely white sample of SMW. However, we hope for more future studies that explicitly promote intersectional approaches.

Implications for future research

This review may encourage further research, especially regarding different subgroups. Why do bisexual women tend to be at higher risk for some of the stress-related conditions such as asthma? Is higher minority stress the main cause, and what alternative explanations are there? Longitudinal studies may provide answers. We mostly found higher heterogeneity in meta-analyses across than within subgroups, underscoring the need to look at the subgroups separately. The results on hypertension and diabetes revealed the importance of accounting for diverse realities of life, for example, by collecting data on pregnancy-related conditions separately. We suggest further exploring of underlying mechanisms: are the lungs particularly at risk of suffering from minority stress? We have mentioned smoking and stress as potential influencing factors. However, these factors are also known to increase CVDs and we did not find elevated CVD rates in SMW. We question the specific mechanisms behind the elevated asthma rates and advocate for further research on this issue. Would the results resemble or differ if other dimensions of sexual orientation (attraction/behavior) were considered? Prior studies identified sexual identity as the primary measure associated with discrimination.²² However, it has also been shown that this measure misses individuals with same-sex attraction/behavior, who also face discrimination.²² Thus, we advocate for systematic

reviews on attraction and behavior, especially for specific conditions where data on sexual identity was scarce (e.g. oral disorders, acne). Large differences, but only from a single study each, were found for some conditions (e.g. periodontitis, acne)-more comparisons are needed to provide more reliable statements. Regarding acne, we have pointed out the potential higher testosterone levels in SMW as a possible explanatory factor. It might be useful to explore how testosterone levels could also be influencing some of the other results found. There were two studies^{40,63} that explicitly took ethnicity into account: we need more studies that include intersectional approaches, that account for multiple dimensions of discrimination that some SMW face, such as race, ethnicity, class, or gender identity. Also, more data on, for example, pansexual, asexual, and queer women would be desirable.

Conclusion

This systematic review and meta-analyses found evidence of physical health disparities by sexual identity. Since some of the findings only rely on a few comparisons, this review is intended to be a vehement plea for routinely including sexual identity assessment in health research. A more detailed picture may ultimately reduce health disparities and ensure optimal medical care with consideration of non-heterosexual sexual identity as a potential risk factor for some diseases.

Declarations

Ethics approval and consent to participate

Not applicable (systematic review with meta-analyses).

Consent for publication

Not applicable (systematic review with meta-analyses).

Author contribution(s)

Lena Haarmann: Conceptualization; Formal analysis; Investigation; Methodology; Project administration; Visualization; Writing – original draft.

Ann-Kristin Folkerts: Conceptualization; Investigation; Methodology; Writing – review & editing.

Emma Lieker: Investigation; Methodology; Writing – review & editing.

Kai Eichert: Formal analysis; Investigation; Writing – review & editing.

Marlene Neidlinger: Formal analysis; Investigation; Writing – review & editing.

Ina Monsef: Methodology; Software; Writing – review & editing.

Nicole Skoetz: Methodology; Software; Writing – review & editing.

Birgit Träuble: Conceptualization; Supervision; Writing – review & editing.

Elke Kalbe: Conceptualization; Methodology; Supervision; Writing – review & editing.

Acknowledgements

The authors thank all authors who kindly replied to the data requests.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Competing interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Availability of data and material

Not applicable (systematic review with meta-analyses).

ORCID iDs

Lena Haarmann (D https://orcid.org/0000-0002-1427-151X Emma Lieker (D https://orcid.org/0000-0001-6887-3412 Marlene Neidlinger (D https://orcid.org/0000-0002-1173-905X

Supplemental material

Supplemental material for this article is available online.

References

- Lick DJ, Durso LE and Johnson KL. Minority stress and physical health among sexual minorities. *Perspect Psychol Sci* 2013; 8(5): 521–548.
- Semlyen J, King M, Varney J, et al. Sexual orientation and symptoms of common mental disorder or low wellbeing: combined meta-analysis of 12 UK population health surveys. *BMC Psychiatry* 2016; 16: 1–9.
- King M, Semlyen J, Tai SS, et al. A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry* 2008; 8: 1–17.
- Miller GE and Chen E. Harsh family climate in early life presages the emergence of a proinflammatory phenotype in adolescence. *Psychol Sci* 2010; 21(6): 848–856.
- Segerstrom SC and Miller GE. Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. *Psychol Bull* 2004; 130(4): 601–630.
- Cohen S, Tyrrell DA and Smith AP. Psychological stress and susceptibility to the common cold. *N Engl J Med* 1991; 325: 606–612.
- DeLongis A, Folkman S and Lazarus RS. The impact of daily stress on health and mood: psychological and social resources as mediators. *J Pers Soc Psychol* 1988; 54(3): 486–495.
- Cohen S, Janicki-Deverts D and Miller GE. Psychological stress and disease. JAMA 2007; 298: 1685–1687.
- Cochran SD and Mays VM. Physical health complaints among lesbians, gay men, and bisexual and homosexually experienced heterosexual individuals: results from the California Quality of Life Survey. *Am J Public Health* 2007; 97(11): 2048–2055.
- Frost DM, Lehavot K and Meyer IH. Minority stress and physical health among sexual minority individuals. J Behav Med 2015; 38: 1–8.

- Pascoe EA and Smart Richman L. Perceived discrimination and health: a meta-analytic review. *Psychol Bull* 2009; 135(4): 531–554.
- Case P, Austin SB, Hunter DJ, et al. Sexual orientation, health risk factors, and physical functioning in the Nurses' Health Study II. *J Womens Health* 2004; 13(9): 1033– 1047.
- Fredriksen-Goldsen KI, Kim HJ, Barkan SE, et al. Health disparities among lesbian, gay, and bisexual older adults: results from a population-based study. *Am J Public Health* 2013; 103(10): 1802–1809.
- Fredriksen-Goldsen KI, Emlet CA, Kim HJ, et al. The physical and mental health of lesbian, gay male, and bisexual (LGB) older adults: the role of key health indicators and risk and protective factors. *Gerontologist* 2013; 53(4): 664–675.
- Dahlhamer JM, Galinsky AM, Joestl SS, et al. Barriers to health care among adults identifying as sexual minorities: a US national study. *Am J Public Health* 2016; 106(6): 1116–1122.
- Eliason MJ. Chronic physical health problems in sexual minority women: review of the literature. *LGBT Health* 2014; 1(4): 259–268.
- Meads C, Martin A, Grierson J, et al. Systematic review and meta-analysis of diabetes mellitus, cardiovascular and respiratory condition epidemiology in sexual minority women. *BMJ Open* 2018; 8: e020776.
- Simoni JM, Smith L, Oost KM, et al. Disparities in physical health conditions among lesbian and bisexual women: a systematic review of population-based studies. *J Homosex* 2017; 64(1): 32–44.
- Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA Statement. *Open Med* 2009; 3: e123–e130.
- Haarmann L, et al. Higher Risk of Physical Health Conditions in Sexual Minority Men: Comprehensive Review and Meta-Analysis in Gay- and Bisexual-Identified Men Compared with Heterosexual-Identified Men. *LGBT Health*. (2023, in press). https://doi.org/10.1089/ lgbt.2023.0084
- Washington School of Medicine tIfHMaEI. GBD Compare, https://vizhub.healthdata.org/gbd-compare/ (2020, accessed 10 February, 2023).
- 22. Geary RS, Tanton C, Erens B, et al. Sexual identity, attraction and behaviour in Britain: the implications of using different dimensions of sexual orientation to estimate the size of sexual minority populations and inform public health interventions. *PLoS ONE* 2018; 13(1): e0189607.
- Review Manager (RevMan) [Computer program]. Version 5.4. The Cochrane Collaboration, 2020.
- 24. Higgins J and Green S. Cochrane handbook of systematic reviews of interventions. Chichester: Wiley-Blackwell, 2008.
- Gray M. CASP Checklists, https://casp-uk.net/casp-toolschecklists/ (2023, accessed 13 June, 2023).
- Agrawal R, Sharma S, Bekir J, et al. Prevalence of polycystic ovaries and polycystic ovary syndrome in lesbian women compared with heterosexual women. *Fertil Steril* 2004; 82(5): 1352–1357.
- 27. Austin A, Herrick H and Proescholdbell S. Adverse childhood experiences related to poor adult health among les-

bian, gay, and bisexual individuals. *Am J Public Health* 2016; 106(2): 314–320.

- 28. Boehmer U, Miao X, Linkletter C, et al. Health conditions in younger, middle, and older ages: are there differences by sexual orientation. *LGBT Health* 2014; 1(3): 168–176.
- Brennan DJ, Ross LE, Dobinson C, et al. Men's sexual orientation and health in Canada. *Can J Public Health* 2010; 101(3): 255–258.
- 30.Brown MJ and Patterson R. Subjective cognitive decline among sexual and gender minorities: results from a U.S. *J Alzheimers Dis* 2020; 73(2): 477–487.
- Caceres BA, Brody AA, Halkitis PN, et al. Cardiovascular disease risk in sexual minority women (18-59 years old): findings from the National Health and Nutrition Examination Survey (2001-2012). Womens Health Issues 2018; 28(4): 333–341.
- 32. Gupta N and Sheng Z. Disparities in the hospital cost of cardiometabolic diseases among lesbian, gay, and bisexual Canadians: a population-based cohort study using linked data. *Can J Public Health* 2020; 111(3): 417–425.
- Hammond NG and Stinchcombe A. Health behaviors and social determinants of migraine in a Canadian populationbased sample of adults aged 45-85 years: findings from the CLSA. *Headache* 2019; 59(9): 1547–1564.
- Jacka B, Roy É, Høj S, et al. Sexual behaviour as a risk factor for hepatitis C virus infection among people who inject drugs in Montreal, Canada. *J Viral Hepat* 2019; 26(12): 1413–1422.
- Landers SJ, Mimiaga MJ and Conron KJ. Sexual orientation differences in asthma correlates in a population-based sample of adults. *Am J Public Health* 2011; 101(12): 2238–2241.
- Operario D, Gamarel KE, Grin BM, et al. Sexual minority health disparities in adult men and women in the United States: National Health and Nutrition Examination Survey, 2001-2010. *Am J Public Health* 2015; 105(10): e27–e34.
- Garland-Forshee RY, Fiala SC, Ngo DL, et al. Sexual orientation and sex differences in adult chronic conditions, health risk factors, and protective health practices, Oregon, 2005-2008. *Prev Chronic Dis* 2014; 11: E136.
- McNair R, Szalacha LA and Hughes TL. Health status, health service use, and satisfaction according to sexual identity of young Australian women. *Womens Health Issues* 2011; 21(1): 40–47.
- Schwartz SB, Sanders AE, Lee JY, et al. Sexual orientation-related oral health disparities in the United States. J Public Health Dent 2019; 79: 18–24.
- Trinh MH, Agenor M, Austin SB, et al. Health and healthcare disparities among U.S. women and men at the intersection of sexual orientation and race/ethnicity: a nationally representative cross-sectional study. *BMC Public Health* 2017; 17: 1–11.
- 41. Wolstein J, Charles SA, Babey SH, et al. Disparities in health care access and health among lesbians, gay men, and bisexuals in California. *Policy Brief UCLA Cent Health Policy Res* 2018; 2018(9): 1–8.
- Beach LB, Elasy TA and Gonzales G. Prevalence of selfreported diabetes by sexual orientation: results from the 2014 behavioral risk factor surveillance system. *LGBT Health* 2018; 5(2): 121–130.

- Blosnich JR, Farmer GW, Lee JG, et al. Health inequalities among sexual minority adults: evidence from ten U.S. States, 2010. *Am J Prev Med* 2014; 46: 337–349.
- Boehmer U, Miao X and Ozonoff A. Cancer survivorship and sexual orientation. *Cancer* 2011; 117: 3796–3804.
- Brown R, McNair R, Szalacha L, et al. Cancer risk factors, diagnosis and sexual identity in the Australian Longitudinal Study of Women's Health. *Womens Health Issues* 2015; 25(5): 509–516.
- 46. Clark CJ, Borowsky IW, Salisbury J, et al. Disparities in long-term cardiovascular disease risk by sexual identity: the National Longitudinal Study of Adolescent to Adult Health. *Prev Med* 2015; 76: 26–30.
- Dai H and Hao J. Sleep deprivation and chronic health conditions among sexual minority adults. *Behav Sleep Med* 2019; 17(3): 254–268.
- De Sutter P, Dutré T, Vanden Meerschaut F, et al. PCOS in lesbian and heterosexual women treated with artificial donor insemination. *Reprod Biomed Online* 2008; 17(3): 398–402.
- Diamant AL and Wold C. Sexual orientation and variation in physical and mental health status among women. *J Womens Health* 2003; 12(1): 41–49.
- Diamant AL, Wold C, Spritzer K, et al. Health behaviors, health status, and access to and use of health care: a population-based study of lesbian, bisexual, and heterosexual women. *Arch Fam Med* 2000; 9(10): 1043–1051.
- 51. Dibble SL, Roberts SA and Nussey B. Comparing breast cancer risk between lesbians and their heterosexual sisters. *Womens Health Issues* 2004; 14(2): 60–68.
- Dibble SL, Roberts SA, Robertson PA, et al. Risk factors for ovarian cancer: lesbian and heterosexual women. *Oncol Nurs Forum* 2002; 29(1): E1–E7.
- 53. Dilley JA, Simmons KW, Boysun MJ, et al. Demonstrating the importance and feasibility of including sexual orientation in public health surveys: health disparities in the Pacific Northwest. *Am J Public Health* 2010; 100(3): 460–467.
- 54. Eliason MJ, Sanchez-Vaznaugh EV and Stupplebeen D. Relationships between sexual orientation, weight, and health in a population-based sample of California women. *Womens Health Issues* 2017; 27(5): 600–606.
- 55. Fredriksen-Goldsen KI, Kim HJ and Barkan SE. Disability among lesbian, gay, and bisexual adults: disparities in prevalence and risk. *Am J Public Health* 2012; 102(1): e16–e21.
- Fredriksen-Goldsen KI, Kim HJ, Shui C, et al. Chronic health conditions and key health indicators among lesbian, gay, and bisexual older US adults, 2013-2014. *Am J Public Health* 2017; 107: 1332–1338.
- Gao J and Mansh M. Sexual orientation disparities in the prevalence of asthma and allergic rhinitis among US adults. *Ann Allergy Asthma Immunol* 2016; 117(4): 435–437.
- Gonzales G and Henning-Smith C. Health disparities by sexual orientation: results and implications from the behavioral risk factor surveillance system. *J Community Health* 2017; 42(6): 1163–1172.
- Gonzales G and Zinone R. Cancer diagnoses among lesbian, gay, and bisexual adults: results from the 2013-2016 National Health Interview Survey. *Cancer Causes Control* 2018; 29(9): 845–854.

- 60.Han BH, Duncan DT, Arcila-Mesa M, et al. Co-occurring mental illness, drug use, and medical multimorbidity among lesbian, gay, and bisexual middle-aged and older adults in the United States: a nationally representative study. *BMC Public Health* 2020; 20: 1–9.
- Heslin KC. Explaining disparities in severe headache and migraine among sexual minority adults in the United States, 2013-2018. *J Nerv Ment Dis* 2020; 208(11): 876– 883.
- 62. Hutchcraft ML, Teferra AA, Montemorano L, et al. Differences in health-related quality of life and health behaviors among lesbian, bisexual, and heterosexual women surviving cancer from the 2013 to 2018 National Health Interview Survey. *LGBT Health* 2021; 8(1): 68–78.
- Kim HJ and Fredriksen-Goldsen KI. Hispanic lesbians and bisexual women at heightened risk for [corrected] health disparities. *Am J Public Health* 2012; 102(1): e9–e15.
- Newlin Lew K, Dorsen C, Melkus GD, et al. Prevalence of obesity, prediabetes, and diabetes in sexual minority women of diverse races/ethnicities: findings from the 2014-2015 BRFSS Surveys. *Diabetes Educ* 2018; 44(4): 348–360.
- Mansh M, Katz KA, Linos E, et al. Association of skin cancer and indoor tanning in sexual minority men and women. *JAMA Dermatol* 2015; 151: 1308–1316.
- Matthews DD and Lee JG. A profile of North Carolina lesbian, gay, and bisexual health disparities, 2011. Am J Public Health 2014; 104(6): e98–e105.
- Patterson JG and Jabson JM. Sexual orientation measurement and chronic disease disparities: National Health and Nutrition Examination Survey, 2009-2014. *Ann Epidemiol* 2018; 28(2): 72–85.
- Saunders CL, Meads C, Abel GA, et al. Associations between sexual orientation and overall and site-specific diagnosis of cancer: evidence from two National Patient Surveys in England. *J Clin Oncol* 2017; 35: 3654–3661.
- Simenson AJ, Corey S, Markovic N, et al. Disparities in chronic health outcomes and health behaviors between lesbian and heterosexual adult women in Pittsburgh: a longitudinal study. *J Womens Health* 2020; 29(8): 1059– 1067.
- Singer S, Tkachenko E, Hartman RI, et al. Association between sexual orientation and lifetime prevalence of skin cancer in the United States. *JAMA Dermatol* 2020; 156: 441–445.
- Smith HA, Markovic N, Matthews AK, et al. A comparison of polycystic ovary syndrome and related factors between lesbian and heterosexual women. *Womens Health Issues* 2011; 21(3): 191–198.
- Strutz KL, Herring AH and Halpern CT. Health disparities among young adult sexual minorities in the U.S. *Am J Prev Med* 2015; 48(1): 76–88.
- Williams AD, Bleicher RJ and Ciocca RM. Breast cancer risk, screening, and prevalence among sexual minority women: an analysis of the National Health Interview Survey. *LGBT Health* 2020; 7(2): 109–118.
- Zaritsky E and Dibble SL. Risk factors for reproductive and breast cancers among older lesbians. *J Womens Health* 2010; 19(1): 125–131.
- 75. Jackson CL, Agenor M, Johnson DA, et al. Sexual orientation identity disparities in health behaviors, outcomes, and

services use among men and women in the United States: a cross-sectional study. *BMC Public Health* 2016; 16: 1–11.

- Farmer GW, Blosnich JR, Jabson JM, et al. Gay acres: sexual orientation differences in health indicators among rural and nonrural individuals. *J Rural Health* 2016; 32(3): 321–331.
- Lietzén R, Virtanen P, Kivimäki M, et al. Stressful life events and the onset of asthma. *Eur Respir J* 2011; 37(6): 1360–1365.
- Job SA, Kaniuka AR, Reeves KM, et al. Interactions of sexual orientation and gender identity with race/ethnicity in prevalence of lifetime and current asthma diagnosis. *LGBT Health* 2023; 10(5): 372–381.
- Gordon AR, Fish JN, Kiekens WJ, et al. Cigarette smoking and minority stress across age cohorts in a national sample of sexual minorities: results from the generations study. *Ann Behav Med* 2021; 55: 530–542.
- Blosnich J, Lee JG and Horn K. A systematic review of the aetiology of tobacco disparities for sexual minorities. *Tob Control* 2013; 22(2): 66–73.
- Collins TW, Grineski SE and Morales DX. Environmental injustice and sexual minority health disparities: a national study of inequitable health risks from air pollution among same-sex partners. *Soc Sci Med* 2017; 191: 38–47.
- Yang H, Lu ML, Haldeman S, et al. Psychosocial risk factors for low back pain in US workers: data from the 2002-2018 quality of work life survey. *Am J Ind Med* 2023; 66(1): 41–53.
- Puschmann AK, Drießlein D, Beck H, et al. Stress and self-efficacy as long-term predictors for chronic low back pain: a prospective longitudinal study. *J Pain Res* 2020; 13: 613–621.
- Conron KJ, Goldberg SK and Halpern CT. Sexual orientation and sex differences in socioeconomic status: a population-based investigation in the National Longitudinal Study of Adolescent to Adult Health. *J Epidemiol Community Health* 2018; 72(11): 1016–1026.
- Burch RC, Buse DC and Lipton RB. Migraine: epidemiology, burden, and comorbidity. *Neurol Clin* 2019; 37(4): 631–649.
- Martin PR. Stress and primary headache: review of the research and clinical management. *Curr Pain Headache Rep* 2016; 20(7): 45–48.
- Centers for Disease Control and Prevention. Gestational diabetes, https://www.cdc.gov/diabetes/basics/gestational. html (2022, accessed 10 February, 2023).
- Hodson K, Meads C and Bewley S. Lesbian and bisexual women's likelihood of becoming pregnant: a systematic review and meta-analysis. *BJOG* 2017; 124(3): 393–402.
- 89. Ford NDC, Shanna C, Ko JY, et al. Hypertensive disorders in pregnancy and mortality at delivery hospitalization

---United States, 2017–2019. https://www.cdc.gov/mmwr/volumes/71/wr/mm7117a1.htm (2022, accessed 10 February, 2023).

- Dunietz GL, Strutz KL, Holzman C, et al. Moderately elevated blood pressure during pregnancy and odds of hypertension later in life: the POUCHmoms longitudinal study. *BJOG* 2017; 124: 1606–1613.
- Morgan KK. Cancer incidence rates by age, https://www. webmd.com/cancer/guide/cancer-incidence-age (2020, accessed 10 February, 2023).
- Johns Hopkins Medicine. Hypertension: what you need to know as you age, https://www.hopkinsmedicine.org/ health/conditions-and-diseases/high-blood-pressurehypertension/hypertension-what-you-need-to-know-asyou-age (2022, accessed 10 February, 2023).
- Helmer J. How age relates to type 2 diabetes, https://www. webmd.com/diabetes/diabetes-link-age (2022, accessed 10 February, 2023).
- Mirabelli MC, Beavers SF, Chatterjee AB, et al. Age at asthma onset and subsequent asthma outcomes among adults with active asthma. *Respir Med* 2013; 107(12): 1829–1836.
- Mayoclinic. Migraine, https://www.mayoclinic.org/diseases-conditions/migraine-headache/symptoms-causes/ syc-20360201 (2022, accessed 10 February, 2023).
- Chen E and Miller GE. Socioeconomic status and health: mediating and moderating factors. *Annu Rev Clin Psychol* 2013; 9: 723–749.
- 97. National Center for Health Statistics U. *Health, United States, 2010.* Hyattsville, MD: National Center for Health Statistics, 2011.
- Harris A, Bewley S and Meads C. Sex hormone levels in lesbian, bisexual, and heterosexual women: systematic review and exploratory meta-analysis. *Arch Sex Behav* 2020; 49(7): 2405–2420.
- Macdowall WG, Clifton S, Palmer MJ, et al. Salivary testosterone and sexual function and behavior in men and women: findings from the Third British National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *J Sex Res* 2022; 59(2): 135–149.
- 100. Feinstein BA and Dyar C. Bisexuality, minority stress, and health. *Curr Sex Health Rep* 2017; 9(1): 42–49.
- Conron KJ, Mimiaga MJ and Landers SJ. A populationbased study of sexual orientation identity and gender differences in adult health. *Am J Public Health* 2010; 100(10): 1953–1960.
- 102. Jorm AF, Korten AE, Rodgers B, et al. Sexual orientation and mental health: results from a community survey of young and middle-aged adults. *Br J Psychiatry* 2002; 180: 423–427.