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Informing Policy with Evidence



# Informing prioritisation of the backlog for elective surgery: summary of a scoping review

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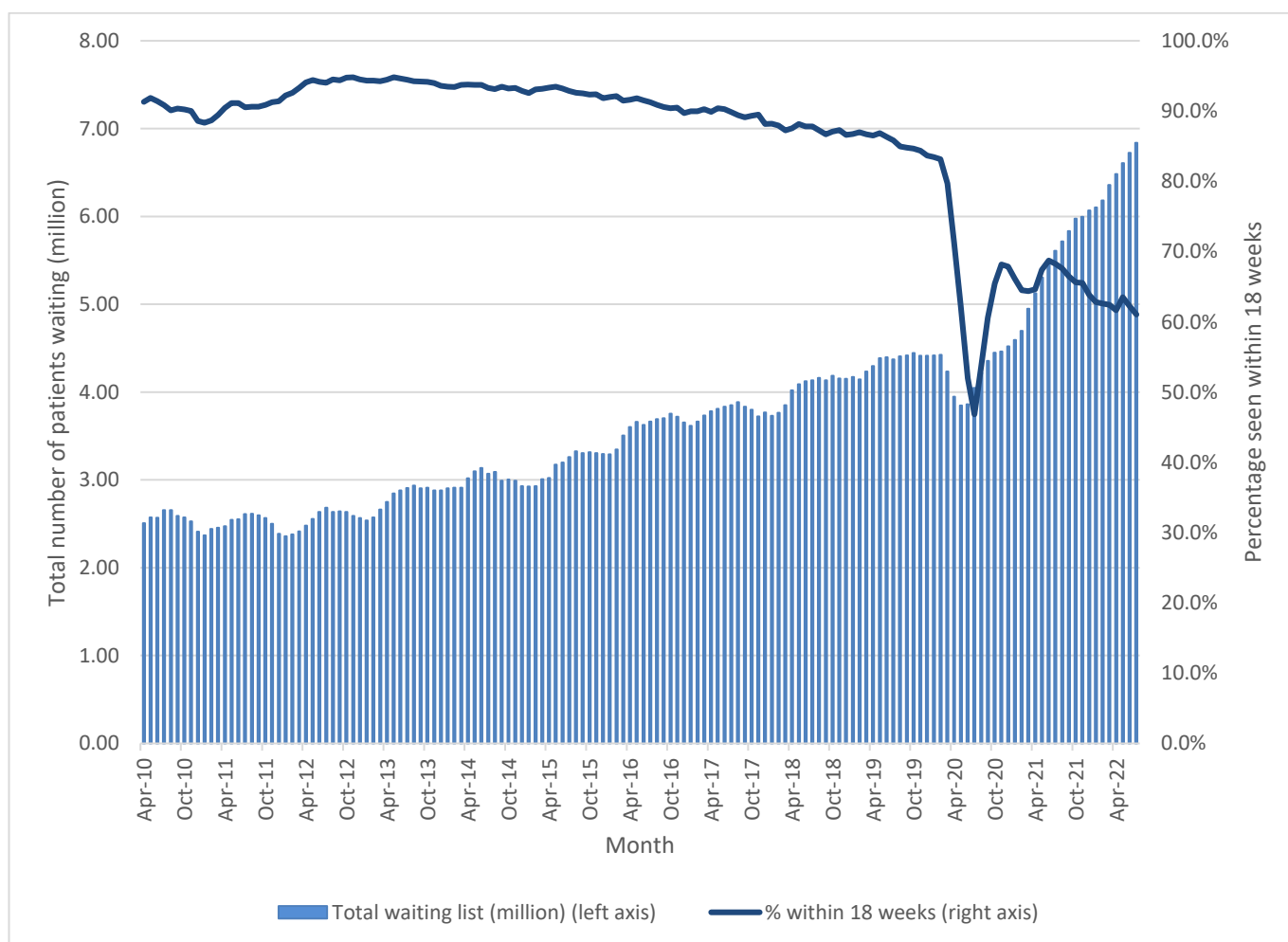
Researchers at the University of York, led by Dr Ana Castro and Veronica Dale, conducted this research, drafted the brief summary and created the associated interactive spreadsheet, with advice and contributions from Professor Trevor Sheldon (Queen Mary's University of London).

The interactive spreadsheet app was created by Joe Moss at York Health Economics consortium ([yhec.co.uk](http://yhec.co.uk)) using R Shiny.

# 1. Background, aims and objectives

In the autumn of 2022 the waiting list to start elective (planned) care numbered over 7.2 million people.<sup>1</sup> Waiting lists and times have been increasing steadily since 2010 but worsened considerably as a result of pent-up demand from the COVID-19 pandemic, during which many services operated at reduced capacity and patients did not seek care (Figure 1). Key waiting time standards (62 days for cancer treatment, 18 weeks for other planned hospital treatment) have not been met since 2015/16 but waiting times have increased sharply since the pandemic – one in 20 are waiting for more than a year (401,000 in September 2022, compared with 1,000 in July 2019) and over 50,000 are waiting more than 18 months.<sup>2</sup> Waiting lists and times vary substantially across the country, and people living in the most deprived areas are waiting longer for hospital treatment, exacerbating health inequalities.<sup>3</sup>

Figure 1: Referral to treatment waiting list and percentage seen within 18 weeks



Source: NHS England consultant-led referral to treatment waiting times data 2022-23<sup>1</sup>

Commentators estimate that it will take years to clear the backlog for NHS elective care. Waiting will result in inconvenience and discomfort for all patients, and considerably worsening health for some.<sup>4,5</sup> A recent ONS survey reported that 18% of people aged 50-65 who left work during the pandemic were currently on an NHS waiting list.<sup>6</sup>

### **1.1. Research aims and objectives**

In this situation, and in order to inform policy and practice on prioritising waiting lists, it is useful to consider the effects of waiting on both patient health and wider society. Our aim is to review existing literature to identify research evidence on the effects of waiting for health care.

Our review objectives are:

1. To assess the impact of longer elective waits on patient health (morbidity, mortality and wellbeing) and to what extent conditions deteriorate in ways that cannot be reversed by subsequent treatment.
2. To assess the impact of longer elective waits on wider society (e.g. on paid and unpaid production, ability to work, volunteer, or provide informal care).
3. To consider how these impacts differ between conditions – particularly those that require urgent intervention (e.g. cancers) and those that progress more slowly (e.g. osteoarthritis).

## 2. Methods

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We used systematic and scoping review methods to address the research objectives. As the volume of literature is high, we approached our research questions using a two-staged approach. First, we conducted a ‘review of reviews’ summarising evidence from existing systematic reviews of the effect of waiting on patient health outcomes (and wider societal outcomes where research existed), mapping the conditions where reviews existed on to a list of the clinical areas where patients are most likely to face waits for surgery (see table 1). This list includes the most common elective surgical procedures, and all treatments for cancer. In stage two, for clinical areas where no systematic review of the impact of waiting on outcomes was available, we conducted a systematic review of primary studies. In both reviews we searched for evidence not just on patient health outcomes but on broader societal outcomes, and noted a subset of studies where such evidence exists.

*Table 1: Interventions of interest: high-volume procedures where patients are likely to wait for treatment (as outlined by OECD)<sup>7</sup> and all cancer treatments*

Intervention
Hip replacement
Knee replacement
Cataract surgery
Hysterectomy
Prostatectomy
Cholecystectomy
Inguinal hernia repair
Femoral hernia repair
Percutaneous transluminal coronary angioplasty (PTCA)
Coronary artery bypass graft (CABG)
All cancer treatments

### 2.1. Search strategy, inclusion and exclusion criteria

#### 2.1.1. Stage 1: review of reviews

We used the following approach to searching in the initial review of reviews (see search strategy 1 in Appendix):

- Exposure: waiting times
- Outcome: health and non-health outcomes
- Study design: systematic reviews
- Restrictions: date limit 2011 onwards, no language restrictions
- Databases: MEDLINE and Embase

We used the following inclusion criteria:

- Systematic reviews
- Effect of early vs delayed intervention
- Elective procedures where the wait could be weeks or longer
- Health and non-health outcomes such as quality of life, survival, mortality, complications, cancer resection rate, ability to work.

And exclusion criteria:

- Emergency procedures or those which could have a waiting time of hours or days (e.g. aneurysm repair, hip fracture)
- Studies determining the optimal time for treatment
- Recommendations for practice during the COVID-19 pandemic, unless they provided relevant underlying evidence
- Descriptions of practical changes implemented during the pandemic.

### 2.1.2. Stage 2: review of primary studies

For clinical areas where waiting is common and no systematic reviews existed, we used the following approach to searching in the review of primary studies (see search strategy 2 in Appendix):

- Population: common waiting list conditions / treatments not already informed by stage 1 (review of reviews)
- Exposure: waiting time
- Outcome: health and non-health outcomes
- Study design: RCTs, quasi-experiments and well-designed observational studies
- Restrictions: date limit 2011 onwards, no language restrictions
- Databases: MEDLINE and Embase.

We used the following inclusion criteria:

- RCTs, quasi-experiments, observational studies
- Ten most common elective procedures (or part of their treatment pathway – e.g. rehabilitation before or after surgery.
- Effect of early vs delayed intervention
- Health and non-health outcomes such as quality of life, survival, mortality, complications, cancer resection rate, ability to work.

And exclusion criteria:

- Studies determining the optimal time for treatment
- Studies comparing clinical and sociodemographic features of patients with different waiting times
- Studies producing a predictive model to prioritise waiting lists.

## 2.2. Quality assessment

In stage 1 we assessed the quality of review studies using the AMSTAR II checklist, a critical appraisal tool for systematic reviews that include randomised and/or non-randomised studies.<sup>8</sup> In stage 2 we assessed the quality of a variety of primary studies (cohort studies, case-control studies, cross-sectional studies and economic studies and an RCT) using an appropriate critical appraisal checklist for each study design:

- For RCTs we used the Risk of Bias 2 tool from Cochrane (2019)<sup>9</sup>
- For cohort studies: Newcastle-Ottawa scale<sup>10</sup>
- For cross sectional studies: an adaptation of the Newcastle Ottawa scale<sup>11</sup>
- For the economic evaluations, a checklist published by the Swedish Institute for Health Technology Assessment.<sup>12</sup>

We converted each appraisal into a quality rating of low, moderate or high.

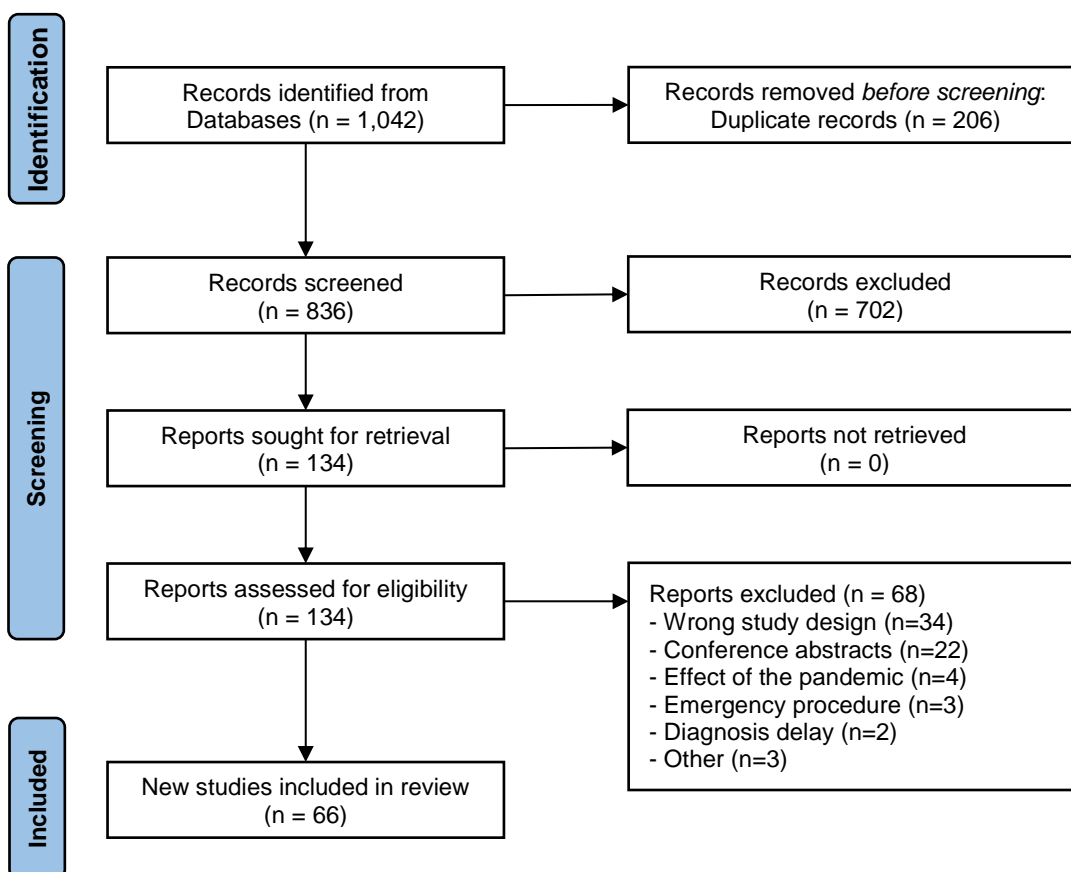
# 3. Findings

## 3.1. Studies included

We included 66 systematic review studies in stage 1 of our research and a further 43 primary studies in stage 2 (see figures 2 and 3).

A number of the reviews included more than one condition and treatment. Review evidence of the impact of delays on patient outcomes was far more common for cancers than for other conditions (see table 2). In stage 2, however, we found relevant evidence for many of the other high-volume elective procedures in primary studies (table 2).

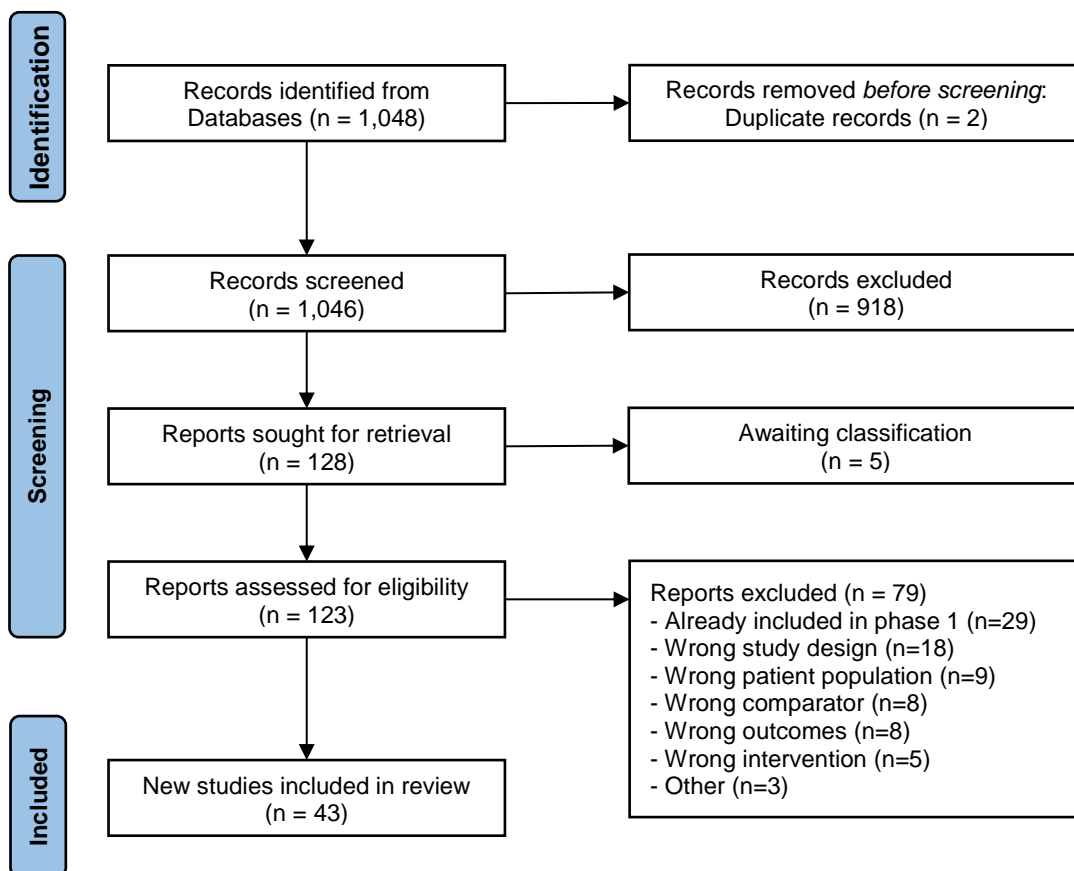
Figure 2: PRISMA flowchart for stage 1, review of reviews



The vast majority of studies reported health effects without measuring any non-health effects on patients or carers, or the impact of long waits on wider society. We did locate ten primary studies measuring wider societal impact – these are listed in box 1.



Figure 3: PRISMA flowchart for stage 2, review of primary studies



**Box 1: Primary studies exploring non-health outcomes and wider societal impact**

- Boyd 2020: Cataract surgery for falls prevention and improving vision: modelling the health gain, health system costs and cost-effectiveness in a high-income country*
- Hinde 2020: Quantifying the impact of delayed delivery of cardiac rehabilitation on patients' health*
- Mather 2014: Economic evaluation of access to musculoskeletal care: the case of waiting for total knee arthroplasty*
- Nikolova 2016: The Impact of Waiting Time on Health Gains from Surgery: Evidence from a National Patient-reported Outcome Dataset*
- 2022: Surgical and financial impact of delayed cholecystectomy in mild and moderate acute cholecystitis*
- Rolfson 2012: Costs related to hip disease in patients eligible for total hip arthroplasty*
- Rovers 2022: Development of a decision analytical framework to prioritise operating room capacity: lessons learnt from an empirical example on delayed elective surgeries during the COVID-19 pandemic in a hospital in the Netherlands*
- Traylor 2021: Impact of Surgical Wait Time to Hysterectomy for Benign Gynecologic Disease*
- Tuominen 2013: Cost-utility of waiting time in total joint replacements: a randomized clinical trial*
- Waqas 2014: Financial cost to institutions on patients waiting for gall bladder disease surgery*

Table 2: Studies assessing the impact of treatment delay: clinical areas and treatments

Condition / Treatment	No. of relevant comparisons from systematic reviews*	Number of relevant comparisons from primary studies**†
<b>Cancers</b>		
Prostate cancer	16	
Lung cancer	16	
Breast cancer	14	
Bladder & urothelial cancer	13	
Head and neck, oral and nasopharyngeal cancer	12	
Colorectal cancer	10	
Gastro-oesophageal cancer	9	
Renal cancer	5	
Cervical cancer	4	
Pancreatic cancer	4	
Brain cancer	3	
Skin cancer	3	
Ovarian cancer	3	
Testicular cancer	3	
Endometrial cancer	2	
Other cancers#	7	
<b>Common waiting list procedures</b>		
Hip and/or knee replacement	1	14
Prostatectomy		8
Hysterectomy		5
Cholecystectomy		6
Inguinal hernia repair	1	4
Cataract surgery	1	3
Coronary artery bypass graft (CABG)	2	3
(cardiac rehabilitation following CABG)		3
<b>Other conditions / treatments where systematic review evidence was obtained</b>		
Rotator cuff repair	1	
Paediatric neurosurgery	1	
Surgery for acromioclavicular joint dislocation	1	
Surgery for post-traumatic elbow stiffness	1	
Cataract surgery for macular degeneration	1	
Treatment for social anxiety disorder	1	
Clozapine for schizophrenia	1	
Paediatric cardiac transplantation	1	
Treatment of ischemia and diabetic foot ulcers	1	
Therapy for pulmonary hypertension	1	
Treatment for multiple sclerosis	1	
Surgery or lithotripsy for acute kidney stones	1	

\*studies may include more than one comparison.

† searches were restricted to the most common waiting list procedures

#cancers of children and young adults, liver cancer, leukaemia, lymphoma, myeloma, penile cancer, sarcoma, thyroid cancer

### 3.2. Interactive spreadsheet

The table illustrates the wide range of conditions and treatments under consideration. In addition, studies were carried out in very different settings and systems, and often focused on different condition subgroups and (particularly for studies of cancer) different stages of the clinical pathway (e.g. wait from diagnosis to surgery or from surgery to chemotherapy). In this situation we believed it unfeasible (and unhelpful) to attempt any overall synthesis of evidence, even a narrative synthesis. Instead, we have created an interactive app (available at [[https://shiny.york.ac.uk/Studies\\_Effect\\_of\\_Waiting\\_Review/](https://shiny.york.ac.uk/Studies_Effect_of_Waiting_Review/)]) which can be used to explore the volume, quality and findings of research evidence, from reviews where they exist and primary studies where they do not, for a variety of conditions and procedures.

The app, a form of interactive spreadsheet, contains information including:

- Author, title, date and DOI for each paper
- Broad condition category (cancer, musculoskeletal etc.)
- Specific conditions (colon cancer, hip osteoarthritis etc.) and subgroups
- Procedures (e.g. cancer treatment, hip replacement) and procedure sub-groups (e.g. chemotherapy) that patients are waiting for, and the stage of the care pathway addressed (e.g. waiting post-surgery for chemotherapy)
- Outcome measures reported (and whether broader non-health or societal outcomes are included)
- Comparisons, time cut-offs and definitions of 'early' and 'delayed' treatment
- Study type (review or primary) and (for reviews) whether a meta-analysis is available
- Quality assessment of each study (using appropriate critical appraisal tools, summarised as low, moderate or high quality).

Additional information includes:

From review studies	From primary studies
<b>Aims of the study</b>	Aims of the study
<b>Study designs included</b>	Study design
<b>Number of studies included</b>	Sample size
<b>Reported quality of the evidence</b>	Country
<b>Authors' conclusions</b>	Authors' conclusions

### 3.3. Using the app

In the app you can select studies on the basis of broad clinical categories (cancer, circulatory system, digestive system, endocrine, nutritional and metabolic, eye, genitourinary, mental and behavioural

disorders, musculoskeletal and nervous system). You can choose to select these broad categories, and/or conditions (and condition subgroups) or procedures (and procedure subgroups). Once you have used the filters to refine the tables, you will see a list of studies in the summary table, and more descriptive information on primary studies and reviews.

For example – to look at studies of the impact of delays on breast cancer outcomes you can filter on 1. Category (cancer) and 2. Condition (breast cancer). This reveals 14 papers and 16 comparisons (Bleicher 2018 includes findings on surgery, chemotherapy and radiotherapy). All are systematic reviews.

To look at the impact of delays in hip and knee replacements you can filter on 1. Category (musculoskeletal) and 2. Procedure (hip arthroplasty, hip/knee arthroplasty, knee arthroplasty). This reveals one systematic review (Morris 2018, including information on both hip and knee surgery) and an additional 12 primary studies and 13 comparisons (Rovers 2022 contains information on both hip and knee surgery).

### 3.4. Summary

The wide range of conditions, treatments and contextual factors covered by this scoping review makes a synthesis of evidence unfeasible. We hope instead that the interactive spreadsheet ([https://shiny.york.ac.uk/Studies\\_Effect\\_of\\_Waiting\\_Review/](https://shiny.york.ac.uk/Studies_Effect_of_Waiting_Review/)) will enable exploration of the impact of waiting for elective care for specific conditions and/or treatments, and that studies within this review can potentially provide parameter estimates for future research modelling the overall impact of treatment delays and prioritising clinical areas for investment.

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# Appendix: approach to literature searching

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Following scoping searches of the literature in MEDLINE and Embase we decided upon on a 2 stage targeted approach to manage the very large volume of literature on the impact of waiting times.

Stage 1 consists of broad searches for systematic reviews on the impact of waiting times and stage 2 consists of searches for primary studies focusing on the common elective procedures for which the OECD have published waiting time statistics.<sup>1</sup>

## Stage 1: Searching for Systematic Reviews

The search contained three facets:

Population = people waiting for elective procedures

Exposure = waiting time 7

Outcome = health and non-health outcomes.

We limited the search to systematic reviews at this stage using a pre-developed search filter. We imposed a date restriction of 2011 onwards, and no language restrictions. 1042 records were retrieved and entered into Endnote. After duplicates were removed we imported 836 records into Covidence for screening.

Database	Interface	Date Searched	Total Records Retrieved	Records with Publication Date 2011 onwards
Medline	OVID	1946 to February 02, 2022	768	506
Embase	OVID	1974 to 2022 February 02	630	536

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<sup>1</sup> <https://stats.oecd.org/FileView2.aspx?IDFile=cae608c4-fa81-4f56-8d7f-a0d4d609de80>

## Search strategy 1: Searching for Systematic Reviews

### Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <1946 to February 02, 2022>

1	Waiting Lists/	13101
2	Time Factors/	1224139
3	Time-to-Treatment/	9392
4	Time/	13972
5	1 and (or/2-4)	3082
6	(wait\$ adj2 time\$).ti,ab,ot,kf,kw.	15910
7	(long\$ adj2 wait\$).ti,ab,ot,kf,kw.	4858
8	(short\$ adj2 wait\$).ti,ab,ot,kf,kw.	1487
9	(reduc\$ adj2 wait\$).ti,ab,ot,kf,kw.	2270
10	(increas\$ adj2 wait\$).ti,ab,ot,kf,kw.	986
11	patient\$ wait\$.ti,ab,ot,kf,kw.	2908
12	men wait\$.ti,ab,ot,kf,kw.	22
13	women wait\$.ti,ab,ot,kf,kw.	146
14	(await\$ adj2 time\$).ti,ab,ot,kf,kw.	76
15	(chang\$ and waiting).ti.	83
16	(chang\$ adj5 waiting).ab,ot,kf,kw.	362
17	time to treatment.ti.	750
18	time to surgery.ti.	490
19	time interval.ti.	1049
20	treatment delay\$.ti,ab,ot,kf,kw.	4279
21	surger\$ delay\$.ti,ab,ot,kf,kw.	413
22	(delay or delays).ti.	28610
23	(impact adj2 delay\$).ab,ot,kf,kw.	765
24	((impact\$ or consequence\$ or effect\$ or outcome\$) adj5 (surg\$ or elective or treatment\$ or procedure\$) adj2 delay\$).ab,ot,kf,kw.	2524
25	reschedule.ti,ab,ot,kf,kw.	145
26	postpone\$.ti.	709
27	(postpone\$ adj5 (surg\$ or elective or treatment\$ or procedure\$)).ab,ot,kf,kw.	2181
28	(cancel or canelled or canceled or cancellation\$ or canceling or cancelling).ti.	1569
29	((cancel or canelled or canceled or cancellation\$ or canceling or cancelling) adj5 (surg\$ or elective or treatment\$ or procedure\$)).ti,ab,ot,kf,kw.	1350
30	or/5-29	64126
31	Elective Surgical Procedures/	16213
32	elective.ti.	16432
33	(elective adj2 surg\$).ti,ab,ot,kf,kw.	23824
34	(elective adj2 procedure\$).ti,ab,ot,kf,kw.	4691
35	non-urgent.ti,ab,ot,kf,kw.	1399
36	non-emerg\$.ti,ab,ot,kf,kw.	1623
37	planned care.ti,ab,ot,kf,kw.	162
38	(elective adj2 treatment\$).ti,ab,ot,kf,kw.	1615
39	elective care.ti,ab,ot,kf,kw.	107

40 elective healthcare.ti,ab,ot,kf,kw. 10  
 41 exp Arthroplasty, Replacement/ 64342  
 42 Orthognathic Surgery/ 926  
 43 Surgery, Plastic/ 27441  
 44 Thoracic Surgery/ 13228  
 45 exp bariatric surgery/ 30160  
 46 exp Cataract Extraction/ 35719  
 47 exp Reconstructive Surgical Procedures/ 233998  
 48 exp oral surgery/ 8887  
 49 exp Urologic Surgical Procedures/ 237705  
 50 exp Orthopedic Procedures/ 337295  
 51 Neurosurgery/16040  
 52 General Surgery/ 40148  
 53 exp Ophthalmologic Surgical Procedures/ 118393  
 54 exp Endocrine Surgical Procedures/ 127380  
 55 exp Cardiovascular Surgical Procedures/ 426444  
 56 exp Mastectomy/ or Vulvectomy/ or Thyroidectomy/ or exp Prostatectomy/ or  
 Pneumonectomy/ or Pancreaticoduodenectomy/ or Orchiectomy/ or Esophagectomy/ or exp  
 Nephrectomy/ or Anterior Temporal Lobectomy/ or Laryngectomy/ or exp Hysterectomy/ or  
 Hepatectomy/ or exp Gastrectomy/ or Cystectomy/ or exp Craniotomy/ or exp Colectomy/ 350121  
 57 exp Minimally Invasive Surgical Procedures/ 567136  
 58 exp Radiotherapy/ or exp Chemoprevention/ or exp Chemoradiotherapy/ or exp Chemotherapy,  
 Adjuvant/ or exp Consolidation Chemotherapy/ or exp Electrochemotherapy/ 254841  
 59 (abdominal surgeries or abdominal surgery or aesthetic surgeries or aesthetic surgery or bariatric  
 surgeries or bariatric surgery or breast surgeries or breast surgery or cancer surgeries or cancer surgery  
 or cardiovascular surgeries or cardiovascular surgery or cataract surgeries or cataract surgery or (ear  
 nose and throat surgeries) or (ear nose and throat surgery) or endocrine surgeries or endocrine surgery  
 or eye surgeries or eye surgery or general surgeries or general surgery or geriatric surgeries or geriatric  
 surgery or (head and neck surgeries) or (head and neck surgery) or hip surgeries or hip surgery or knee  
 surgeries or knee surgery or neurosurgeries or neurosurgery or pharynx surgeries or pharynx surgery or  
 oral surgeries or oral surgery or orthognathic surgeries or orthognathic surgery or orthopedic surgeries  
 or orthopedic surgery or pelvis surgeries or pelvis surgery or throat surgeries or throat surgery or plastic  
 surgeries or plastic surgery or reconstructive surgeries or reconstructive surgery or thorax surgeries or  
 thorax surgery or urologic surgeries or urologic surgery).ti. 74595  
 60 (Mastectomy or Vulvectomy or Thyroidectomy or Prostatectomy or Pneumonectomy or  
 Pancreaticoduodenectomy or Orchiectomy or Esophagectomy or Oesophagectomy or Nephrectomy or  
 Lobectomy or Laryngectomy or Hysterectomy or Hepatectomy or Gastrectomy or Cystectomy or  
 Craniotomy or Colectomy).ti. 116922  
 61 Surgical Procedures, Operative/ 56652  
 62 ((hip or knee or total) adj2 replacement).ti. 12448  
 63 ((hip or knee or total) adj2 arthroplasty).ti. 39127  
 64 (radiotherapy or chemotherapy).ti. 175659  
 65 radiation therap\$.ti. 27134  
 66 cancer.ti. and su.fs. 128947  
 67 carcinoma.ti. and su.fs. 67545  
 68 cancer treatment\$.ti. 11793  
 69 dialysis.ti. 41836



70 Dialysis/ 12736  
71 nonemerg\$.ti,ab,ot,kf,kw. 1604  
72 nonurgent.ti,ab,ot,kf,kw. 842  
73 (planned adj2 surg\$.ti,ab,ot,kf,kw. 3377  
74 or/31-73 2571945  
75 exp Treatment Outcome/ 1172724  
76 exp Outcome Assessment, Health Care/ 1261535  
77 Health Status/ 87201  
78 "Quality of Life"/ 232557  
79 exp Disease Progression/ 199786  
80 prognostic.ti. 102635  
81 (prognostic adj (factor\$ or role or value or implications or significance)).ab,ot,kf,kw. 173266  
82 deteriorat\$.ti,ab,ot,kf,kw. 141973  
83 (disease adj2 progress\$.ti,ab,ot,kf,kw. 135693  
84 pain.ti,ab,ot,kf,kw. 700840  
85 (function\$ adj2 outcome\$.ti,ab,ot,kf,kw. 59272  
86 function\$.ti. 792381  
87 discomfort.ti,ab,ot,kf,kw. 50776  
88 quality of life.ti,ab,ot,kf,kw. 330614  
89 morbidity.ti,ab,ot,kf,kw. 414664  
90 waiting lists/mo 768  
91 mortality.ti. 142686  
92 death.ti. 124736  
93 wellbeing.ti,ab,ot,kf,kw. 22638  
94 survival.ti. 157830  
95 ((increas\$ or decreas\$) adj survival).ab,ot,kf,kw. 21601  
96 utility loss.ti,ab,ot,kf,kw. 81  
97 quality of life.ti,ab,ot,kf,kw. 330614  
98 (patient adj2 outcome\$.ab,ot,kf,kw.99570  
99 (health adj2 outcome\$.ab,ot,kf,kw. 71651  
100 (impact or impacts).ti.294768  
101 health impact.ab,ot,kf,kw. 9761  
102 consequence\$.ti. 47441  
103 outcome\$.ti. 395098  
104 effect.ti. 964564  
105 relapse.ti. 17083  
106 recurrence.ti. 44102  
107 exp Recurrence/ 194430  
108 neoplasms, second primary/ 15713  
109 Survival/ 4894  
110 exp Survival Analysis/ 325279  
111 or/75-110 5696781  
112 ec.fs. 441086  
113 (unpaid work or paid work).ti,ab,ot,kf,kw. 1493  
114 (caregiver\$ or carer\$.ti,ab,ot,kf,kw. 92495  
115 return to work.ti,ab,ot,kf,kw. 10409

116 (wage or wages or income\$ or salary or salaries or welfare or employment or unemployment or job or career\$).ti,ab,ot,kf,kw. 361393  
 117 exp work/ 68113  
 118 Caregivers/ 44151  
 119 exp private sector/ or public sector/ 12853  
 120 exp "Salaries and Fringe Benefits"/ 33042  
 121 economics/ 27414  
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 124 work.ti. 95417  
 125 Social Welfare/ 9568  
 126 employment/ or career mobility/ or employment, supported/ or return to work/ or unemployment/ 69496  
 127 social change/ 17322  
 128 work disabilit\$.ti,ab,ot,kf,kw. 2224  
 129 (social adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or change\$)).ti,ab,ot,kf,kw. 35559  
 130 (societ\$ adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or change\$)).ti,ab,ot,kf,kw. 5357  
 131 unemployed.ti,ab,ot,kf,kw. 9993  
 132 or/112-131 1097243  
 133 111 or 132 6543176  
 134 30 and 74 and 133 6522  
 135 ((impact or impacts or consequence\$ or effect\$ or outcome\$ or survival or mortality) and (surg\$ or elective or treatment\$ or procedure\$ or cancer) and (delay\$ or wait\$)).ti. 2082  
 136 (((impact or impacts or consequence\$ or effect\$ or outcome\$ or survival or mortality) and (surg\$ or elective or treatment\$ or procedure\$ or cancer) and (increas\$ or longer)) adj2 time).ti. 53  
 137 134 or 135 or 136 8178  
 138 (((systematic or state-of-the-art or scoping or literature or umbrella) adj (review\* or overview\* or assessment\*)) or "review\* of reviews" or meta-analy\* or metaanaly\* or ((systematic or evidence) adj1 assess\*) or "research evidence" or metasynthe\* or meta-synthe\*).tw. or exp Review Literature as Topic/ or exp Review/ or Meta-Analysis as Topic/ or Meta-Analysis/ or "systematic review"/ 3208741  
 139 137 and 138 768  
 140 limit 139 to yr="2011 -Current" 506

## Embase <1974 to 2022 February 02>

1 hospital admission/ 232284  
 2 Time Factor/ 43441  
 3 time to treatment/ 21542  
 4 Time/ 323111  
 5 1 and (or/2-4) 4282  
 6 (wait\$ adj2 time\$).ti,ab,ot,kf,kw. 26035

7 (long\$ adj2 wait\$).ti,ab,ot,kf,kw. 7698  
8 (short\$ adj2 wait\$).ti,ab,ot,kf,kw. 2410  
9 (reduc\$ adj2 wait\$).ti,ab,ot,kf,kw. 4034  
10 (increas\$ adj2 wait\$).ti,ab,ot,kf,kw. 1759  
11 patient\$ wait\$.ti,ab,ot,kf,kw. 5109  
12 men wait\$.ti,ab,ot,kf,kw. 29  
13 women wait\$.ti,ab,ot,kf,kw. 211  
14 (await\$ adj2 time\$).ti,ab,ot,kf,kw. 139  
15 (chang\$ and waiting).ti. 109  
16 (chang\$ adj5 waiting).ab,ot,kf,kw. 551  
17 time to treatment.ti. 1232  
18 time to surgery.ti. 653  
19 time interval.ti. 1313  
20 treatment delay\$.ti,ab,ot,kf,kw. 7299  
21 surger\$ delay\$.ti,ab,ot,kf,kw. 655  
22 ((impact or impacts) adj2 delay\$).ab,ot,kf,kw. 1396  
23 (delay or delays).ti. 34800  
24 ((impact\$ or consequence\$ or effect\$ or outcome\$) adj5 (surg\$ or elective or treatment\$ or  
procedure\$) adj2 delay\$).ab,ot,kf,kw. 3805  
25 reschedule.ti,ab,ot,kf,kw. 289  
26 postpone\$.ti. 785  
27 (postpone\$ adj5 (surg\$ or elective or treatment\$ or procedure\$)).ab,ot,kf,kw. 3413  
28 (cancel or canelled or canceled or cancellation\$ or canceling or cancelling).ti. 1659  
29 ((cancel or canelled or canceled or cancellation\$ or canceling or cancelling) adj5 (surg\$ or  
elective or treatment\$ or procedure\$)).ti,ab,ot,kf,kw. 2113  
30 or/5-29 92103  
31 elective surgery/ 40590  
32 elective.ti. 22246  
33 (elective adj2 surg\$).ti,ab,ot,kf,kw. 33706  
34 (elective adj2 procedure\$).ti,ab,ot,kf,kw. 7102  
35 non-urgent.ti,ab,ot,kf,kw. 2325  
36 non-emerg\$.ti,ab,ot,kf,kw. 2840  
37 planned care.ti,ab,ot,kf,kw. 215  
38 (elective adj2 treatment\$).ti,ab,ot,kf,kw. 2228  
39 elective care.ti,ab,ot,kf,kw. 138  
40 elective healthcare.ti,ab,ot,kf,kw. 13  
41 exp arthroplasty/ 89847  
42 exp orthognathic surgery/ 10677  
43 exp plastic surgery/ 279680  
44 exp thorax surgery/ 651766  
45 exp bariatric surgery/ 50208  
46 exp cataract extraction/ 49953  
47 reconstructive surgery/ 14248  
48 exp oral surgery/ 53598  
49 exp urologic surgery/ 607051  
50 exp orthopedic surgery/ 525617  
51 exp neurosurgery/ 276972

52 general surgery/ 17940

53 exp eye surgery/ 158859

54 exp endocrine surgery/ 113122

55 exp cardiovascular surgery/ 779984

56 exp mastectomy/ or vulvectomy/ or thyroidectomy/ or exp prostatectomy/ or lung resection/ or pancreaticoduodenectomy/ or orchiectomy/ or esophagus resection/ or exp nephrectomy/ or temporal lobectomy/ or laryngectomy/ or exp hysterectomy/ or exp liver resection/ or exp gastrectomy/ or cystectomy/ or exp craniotomy/ or exp colon resection/ 649922

57 minimally invasive surgery/ 47832

58 electrochemotherapy/ or consolidation chemotherapy/ or exp adjuvant chemotherapy/ or exp chemoradiotherapy/ or chemoprophylaxis/ or exp radiotherapy/ 659599

59 (abdominal surgeries or abdominal surgery or aesthetic surgeries or aesthetic surgery or bariatric surgeries or bariatric surgery or breast surgeries or breast surgery or cancer surgeries or cancer surgery cardiovascular surgeries or cardiovascular surgery or cataract surgeries or cataract surgery or (ear nose and throat surgeries) or (ear nose and throat surgery) or endocrine surgeries or endocrine surgery or eye surgeries or eye surgery or general surgeries or general surgery or geriatric surgeries or geriatric surgery or (head and neck surgeries) or (head and neck surgery) or hip surgeries or hip surgery or knee surgeries or knee surgery or neurosurgeries or neurosurgery or pharynx surgeries or pharynx surgery or oral surgeries or oral surgery or orthognathic surgeries or orthognathic surgery or orthopedic surgeries or orthopedic surgery or pelvis surgeries or pelvis surgery or throat surgeries or throat surgery or plastic surgeries or plastic surgery or reconstructive surgeries or reconstructive surgery or thorax surgeries or thorax surgery or transplant surgeries or transplant surgery or urologic surgeries or urologic surgery).ti. 80608

60 (Mastectomy or Vulvectomy or Thyroidectomy or Prostatectomy or Pneumonectomy or Pancreaticoduodenectomy or Orchiectomy or Esophagectomy or Oesophagectomy or Nephrectomy or Lobectomy or Laryngectomy or Hysterectomy or Hepatectomy or Gastrectomy or Cystectomy or Craniotomy or Colectomy).ti. 154754

61 surgery/ 630914

62 ((hip or knee or total) adj2 replacement).ti. 15814

63 ((hip or knee or total) adj2 arthroplasty).ti. 43983

64 (radiotherapy or chemotherapy).ti. 247155

65 radiation therap\$.ti. 41166

66 cancer.ti. and su.fs. 191358

67 carcinoma.ti. and su.fs. 96776

68 cancer treatment\$.ti. 16218

69 exp cancer surgery/ 401565

70 dialysis.ti. 53749

71 exp dialysis/ 204711

72 nonemerg\$.ti,ab,ot,kf,kw. 1893

73 nonurgent.ti,ab,ot,kf,kw. 1045

74 (planned adj2 surg\$).ti,ab,ot,kf,kw. 5595

75 or/31-74 4400451

76 exp treatment outcome/ 1908027

77 exp outcome assessment/ 646706

78 exp health status/ 270667

79 exp "quality of life"/ 565493

80 disease exacerbation/148489

81 prognostic.ti. 146610  
82 (prognostic adj (factor\$ or role or value or implications or significance)).ab,ot,kf,kw. 268079  
83 deteriorat\$.ti,ab,ot,kf,kw. 201785  
84 (disease adj2 progress\$).ti,ab,ot,kf,kw. 237805  
85 pain.ti,ab,ot,kf,kw. 1043617  
86 (function\$ adj2 outcome\$).ti,ab,ot,kf,kw. 85944  
87 function\$.ti. 909855  
88 discomfort.ti,ab,ot,kf,kw. 76787  
89 quality of life.ti,ab,ot,kf,kw. 523208  
90 morbidity.ti,ab,ot,kf,kw. 615220  
91 mortality.ti. 182071  
92 death.ti. 141916  
93 wellbeing.ti,ab,ot,kf,kw. 33657  
94 survival.ti. 215397  
95 ((increas\$ or decreas\$) adj survival).ab,ot,kf,kw. 32660  
96 utility loss.ti,ab,ot,kf,kw. 127  
97 quality of life.ti,ab,ot,kf,kw. 523208  
98 (patient adj2 outcome\$).ab,ot,kf,kw. 156267  
99 (health adj2 outcome\$).ab,ot,kf,kw. 93151  
100 (impact or impacts).ti. 420329  
101 health impact.ab,ot,kf,kw. 11516  
102 consequence\$.ti. 54939  
103 outcome\$.ti. 607432  
104 effect.ti. 1034392  
105 relapse.ti. 26082  
106 recurrence.ti. 63211  
107 recurrent disease/ 194803  
108 second cancer/ 14290  
109 exp survival/ 1269496  
110 survival analysis/ 33337  
111 Dialysis/ 55135  
112 or/76-111 8078568  
113 ec.fs. 5852296  
114 (unpaid work or paid work).ti,ab,ot,kf,kw. 1809  
115 (caregiver\$ or carer\$).ti,ab,ot,kf,kw. 130497  
116 return to work.ti,ab,ot,kf,kw. 13569  
117 (wage or wages or income\$ or salary or salaries or welfare or employment or unemployment or  
job or career\$).ti,ab,ot,kf,kw. 441042  
118 exp work/ 390790  
119 caregiver/ 96142  
120 private sector/ 3459  
121 public sector/ 3042  
122 exp "salary and fringe benefit"/ 34360  
123 economics/ 243339  
124 job loss\$.ti,ab,ot,kf,kw. 1446  
125 (financial adj2 (ramification\$ or impact\$ or consequence\$ or outcome\$ or  
effect\$)).ti,ab,ot,kf,kw. 9007

126 work.ti. 94292  
 127 welfare/ or social welfare/ 28284  
 128 exp employment/ 110244  
 129 career mobility/ 10783  
 130 exp employment status/ 39591  
 131 social change/ 13106  
 132 work disabilit\$.ti,ab,ot,kf,kw. 3073  
 133 (social adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or change\$)).ti,ab,ot,kf,kw. 41454  
 134 (societ\$ adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or change\$)).ti,ab,ot,kf,kw. 6633  
 135 unemployed.ti,ab,ot,kf,kw. 14040  
 136 or/113-135 7083806  
 137 112 or 136 13476851  
 138 30 and 75 and 137 15517  
 139 ((impact or impacts or consequence\$ or effect\$ or outcome\$ or survival) and (surg\$ or elective or treatment\$ or procedure\$ or cancer) and (delay\$ or wait\$)).ti. 2824  
 140 (((impact or impacts or consequence\$ or effect\$ or outcome\$ or survival) and (surg\$ or elective or treatment\$ or procedure\$ or cancer) and (increas\$ or longer)) adj2 time).ti. 78  
 141 138 or 139 or 140 17564  
 142 (((systematic or state-of-the-art or scoping or literature or umbrella) adj (review\* or overview\* or assessment\*)) or "review\* of reviews" or meta-analy\* or metaanaly\* or ((systematic or evidence) adj1 assess\*) or "research evidence" or metasynthe\* or meta-synthe\*).tw. or systematic review/ or "systematic review (topic)"/ or meta analysis/ or "meta analysis (topic)"/ 731012  
 143 141 and 142 630  
 144 limit 143 to yr="2011 -Current" 536

## Stage 2: Searching for Primary Studies

The seven elective procedures we focused on for the primary studies search are: cataract surgery, percutaneous transluminal coronary angioplasty (PTCA), coronary bypass, prostatectomy, hysterectomy, hip replacement and knee replacement. We searched for terms for these procedures in conjunction with Exposure = waiting time and Outcome = health and non-health outcomes. We searched both MEDLINE and Embase.

After stage 1, of the common waiting list conditions, the following areas remained uninformed:

Coronary bypass, PTCA

Hysterectomy

Hernia repair

Cholecystectomy

Prostatectomy

A further two areas were informed by limited evidence from one systematic review;

Cataract surgery

Hip and knee replacement

We imposed a date restriction of 2011 onwards, and no language restrictions. We excluded where possible letters, editorials and commentaries as well as conference papers. 1506 records were retrieved and entered into Endnote. After duplicates were removed we imported 1048 records into Covidence for screening.

Database	Interface	Date Searched	Records with Publication Date 2011 onwards
Medline	OVID	1946 to May 05, 2022	569
Embase	OVID	1974 to 2022 May 05	937

## Search strategy 2: Searching for Primary Studies

### Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <1946 to May 05, 2022>

- 1 Waiting Lists/ (13324)
- 2 Time Factors/ (1227272)
- 3 Time-to-Treatment/ (9625)
- 4 Time/ (14067)
- 5 1 and (or/2-4) (3107)
- 6 (wait\$ adj2 time\$).ti,ab,ot,kf,kw. (16266)
- 7 (long\$ adj2 wait\$).ti,ab,ot,kf,kw. (4985)
- 8 (short\$ adj2 wait\$).ti,ab,ot,kf,kw. (1516)
- 9 (reduc\$ adj2 wait\$).ti,ab,ot,kf,kw. (2321)
- 10 (increas\$ adj2 wait\$).ti,ab,ot,kf,kw. (1014)
- 11 patient\$ wait\$.ti,ab,ot,kf,kw. (2975)
- 12 men wait\$.ti,ab,ot,kf,kw. (22)
- 13 women wait\$.ti,ab,ot,kf,kw. (151)
- 14 (await\$ adj2 time\$).ti,ab,ot,kf,kw. (77)
- 15 (chang\$ and waiting).ti. (84)
- 16 (chang\$ adj5 waiting).ab,ot,kf,kw. (369)
- 17 time to treatment.ti. (765)
- 18 time to surgery.ti. (499)
- 19 time interval.ti. (1057)
- 20 treatment delay\$.ti,ab,ot,kf,kw. (4404)
- 21 surger\$ delay\$.ti,ab,ot,kf,kw. (428)
- 22 (delay or delays).ti. (29059)
- 23 (impact adj2 delay\$).ab,ot,kf,kw. (783)
- 24 ((impact\$ or consequence\$ or effect\$ or outcome\$) adj5 (surg\$ or elective or treatment\$ or procedure\$) adj2 delay\$).ab,ot,kf,kw. (2576)
- 25 reschedule.ti,ab,ot,kf,kw. (147)
- 26 postpone\$.ti. (716)
- 27 (postpone\$ adj5 (surg\$ or elective or treatment\$ or procedure\$)).ab,ot,kf,kw. (2239)
- 28 (cancel or canelled or canceled or cancellation\$ or canceling or cancelling).ti. (1591)

29 ((cancel or cancelled or canceled or cancellation\$ or canceling or cancelling) adj5 (surg\$ or elective  
 or  
 treatment\$ or procedure\$)).ti,ab,ot,kf,kw. (1391)  
 30 or/5-29 (65334)  
 31 exp Treatment Outcome/ (1193665)  
 32 exp Outcome Assessment, Health Care/ (1284334)  
 33 Health Status/ (87893)  
 34 "Quality of Life"/ (241472)  
 35 exp Disease Progression/ (202452)  
 36 prognostic.ti. (105308)  
 37 (prognostic adj (factor\$ or role or value or implications or significance)).ab,ot,kf,kw. (177378)  
 38 deteriorat\$.ti,ab,ot,kf,kw. (144812)  
 39 (disease adj2 progress\$).ti,ab,ot,kf,kw. (138784)  
 40 pain.ti,ab,ot,kf,kw. (714177)  
 41 (function\$ adj2 outcome\$).ti,ab,ot,kf,kw. (61003)  
 42 function\$.ti. (803193)  
 43 discomfort.ti,ab,ot,kf,kw. (51758)  
 44 quality of life.ti,ab,ot,kf,kw. (339511)  
 45 morbidity.ti,ab,ot,kf,kw. (421767)  
 46 waiting lists/mo (782)  
 47 mortality.ti. (145633)  
 48 death.ti. (126183)  
 49 wellbeing.ti,ab,ot,kf,kw. (24029)  
 50 survival.ti. (160498)  
 51 ((increas\$ or decreas\$) adj survival).ab,ot,kf,kw. (21931)  
 52 utility loss.ti,ab,ot,kf,kw. (83)  
 53 quality of life.ti,ab,ot,kf,kw. (339511)  
 54 (patient adj2 outcome\$).ab,ot,kf,kw. (103308)  
 55 (health adj2 outcome\$).ab,ot,kf,kw. (74176)  
 56 (impact or impacts).ti. (303580)  
 57 health impact.ab,ot,kf,kw. (10001)  
 58 consequence\$.ti. (48021)  
 59 outcome\$.ti. (405754)  
 60 effect.ti. (975095)  
 61 relapse.ti. (17360)  
 62 recurrence.ti. (45012)  
 63 exp Recurrence/ (196287)  
 64 Survival/ (4907)  
 65 exp Survival Analysis/ (329451)  
 66 or/31-65 (5783594)  
 67 ec.fs. (442102)  
 68 (unpaid work or paid work).ti,ab,ot,kf,kw. (1529)  
 69 (caregiver\$ or carer\$).ti,ab,ot,kf,kw. (95184)  
 70 return to work.ti,ab,ot,kf,kw. (10640)  
 71 (wage or wages or income\$ or salary or salaries or welfare or employment or unemployment or job  
 or  
 career\$).ti,ab,ot,kf,kw. (370641)



72 exp work/ (68682)  
73 Caregivers/ (45577)  
74 exp private sector/ or public sector/ (12951)  
75 exp "Salaries and Fringe Benefits"/ (33257)  
76 economics/ (27447)  
77 job loss\$.ti,ab,ot,kf,kw. (1283)  
78 (financial adj2 (ramification\$ or impact\$ or consequence\$ or outcome\$ or effect\$)).ti,ab,ot,kf,kw.  
(6178)  
79 work.ti. (96534)  
80 Social Welfare/ (9620)  
81 employment/ or career mobility/ or employment, supported/ or return to work/ or  
unemployment/ (70132)  
82 social change/ (17364)  
83 work disabilit\$.ti,ab,ot,kf,kw. (2252)  
84 (social adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or  
change\$)).ti,ab,ot,kf,kw. (36516)  
85 (societ\$ adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or  
change\$)).ti,ab,ot,kf,kw. (5511)  
86 unemployed.ti,ab,ot,kf,kw. (10236)  
87 or/67-86 (1112471)  
88 66 or 87 (6640380)  
89 30 and 88 (23845)  
90 Angioplasty, Balloon, Coronary/ (35987)  
91 ptca.ti,ab,ot,kf,kw. (6574)  
92 coronary angioplasty.ti,ab,ot,kf,kw. (13216)  
93 exp Coronary Artery Bypass/ (55613)  
94 (coronary adj2 bypass).ti,ab,ot,kf,kw. (51699)  
95 aortocoronary bypass.ti,ab,ot,kf,kw. (2412)  
96 exp Prostatectomy/ (34708)  
97 Prostatectom\$.ti,ab,ot,kf,kw. (34321)  
98 exp Hysterectomy/ (32915)  
99 hysterectom\$.ti,ab,ot,kf,kw. (40980)  
100 Herniorrhaphy/ (10397)  
101 Herniorrhaph\$.ti,ab,ot,kf,kw. (2644)  
102 hernioplasty.ti,ab,ot,kf,kw. (1686)  
103 (hernia adj3 repair\$).ti,ab,ot,kf,kw. (14699)  
104 hernia operation\$.ti,ab,ot,kf,kw. (425)  
105 hernia surg\$.ti,ab,ot,kf,kw. (2071)  
106 (Gallbladder adj2 removal).ti,ab,ot,kf,kw. (190)  
107 Cholecystectom\$.ti,ab,ot,kf,kw. (31935)  
108 exp Cholecystectomy/ (30093)  
109 gallbladder surg\$.ti,ab,ot,kf,kw. (669)  
110 gallbladder operation\$.ti,ab,ot,kf,kw. (37)  
111 exp Cataract Extraction/ (36064)  
112 cataract extraction\$.ti,ab,ot,kf,kw. (9357)  
113 cataract surger\$.ti,ab,ot,kf,kw. (21547)  
114 Arthroplasty, Replacement, Hip/ (32139)

- 115 hip replacement\$.ti,ab,ot,kf,kw. (13751)
- 116 hip arthroplast\$.ti,ab,ot,kf,kw. (28310)
- 117 (hip prosthesis adj2 implantation\$.ti,ab,ot,kf,kw. (82)
- 118 Arthroplasty, Replacement, Knee/ (29077)
- 119 knee replacement\$.ti,ab,ot,kf,kw. (10932)
- 120 knee arthroplast\$.ti,ab,ot,kf,kw. (29535)
- 121 or/90-120 (394488)
- 122 89 and 121 (1127)
- 123 limit 122 to yr="2011 -Current" (602)
- 124 123 not (letter or editorial or news or comment or case reports).pt. (569)

**Database: Embase <1974 to 2022 May 05>**

- 1 hospital admission/ (239245)
- 2 Time Factor/ (44614)
- 3 time to treatment/ (22486)
- 4 Time/ (323872)
- 5 1 and (or/2-4) (4421)
- 6 (wait\$ adj2 time\$.ti,ab,ot,kf,kw. (26625)
- 7 (long\$ adj2 wait\$.ti,ab,ot,kf,kw. (7875)
- 8 (short\$ adj2 wait\$.ti,ab,ot,kf,kw. (2454)
- 9 (reduc\$ adj2 wait\$.ti,ab,ot,kf,kw. (4147)
- 10 (increas\$ adj2 wait\$.ti,ab,ot,kf,kw. (1810)
- 11 patient\$ wait\$.ti,ab,ot,kf,kw. (5195)
- 12 men wait\$.ti,ab,ot,kf,kw. (29)
- 13 women wait\$.ti,ab,ot,kf,kw. (215)
- 14 (await\$ adj2 time\$.ti,ab,ot,kf,kw. (141)
- 15 (chang\$ and waiting).ti. (111)
- 16 (chang\$ adj5 waiting).ab,ot,kf,kw. (558)
- 17 time to treatment.ti. (1263)
- 18 time to surgery.ti. (670)
- 19 time interval.ti. (1327)
- 20 treatment delay\$.ti,ab,ot,kf,kw. (7488)
- 21 surger\$ delay\$.ti,ab,ot,kf,kw. (678)
- 22 ((impact or impacts) adj2 delay\$.ab,ot,kf,kw. (1440)
- 23 (delay or delays).ti. (35398)
- 24 ((impact\$ or consequence\$ or effect\$ or outcome\$) adj5 (surg\$ or elective or treatment\$ or procedure\$) adj2 delay\$.ab,ot,kf,kw. (3894)
- 25 reschedule.ti,ab,ot,kf,kw. (293)
- 26 postpone\$.ti. (804)
- 27 (postpone\$ adj5 (surg\$ or elective or treatment\$ or procedure\$)).ab,ot,kf,kw. (3516)
- 28 (cancel or canelled or canceled or cancellation\$ or canceling or cancelling).ti. (1686)
- 29 ((cancel or canelled or canceled or cancellation\$ or canceling or cancelling) adj5 (surg\$ or elective or treatment\$ or procedure\$)).ti,ab,ot,kf,kw. (2190)
- 30 or/5-29 (94032)

31 exp treatment outcome/ (1972794)  
32 exp outcome assessment/ (689716)  
33 exp health status/ (276802)  
34 exp "quality of life"/ (578573)  
35 disease exacerbation/ (154063)  
36 prognostic.ti. (149814)  
37 (prognostic adj (factor\$ or role or value or implications or significance)).ab,ot,kf,kw. (273288)  
38 deteriorat\$.ti,ab,ot,kf,kw. (205462)  
39 (disease adj2 progress\$).ti,ab,ot,kf,kw. (243200)  
40 pain.ti,ab,ot,kf,kw. (1062871)  
41 (function\$ adj2 outcome\$).ti,ab,ot,kf,kw. (88297)  
42 function\$.ti. (923290)  
43 discomfort.ti,ab,ot,kf,kw. (78122)  
44 quality of life.ti,ab,ot,kf,kw. (535225)  
45 morbidity.ti,ab,ot,kf,kw. (626078)  
46 mortality.ti. (186075)  
47 death.ti. (143849)  
48 wellbeing.ti,ab,ot,kf,kw. (35157)  
49 survival.ti. (218884)  
50 ((increas\$ or decreas\$) adj survival).ab,ot,kf,kw. (33176)  
51 utility loss.ti,ab,ot,kf,kw. (130)  
52 quality of life.ti,ab,ot,kf,kw. (535225)  
53 (patient adj2 outcome\$).ab,ot,kf,kw. (161398)  
54 (health adj2 outcome\$).ab,ot,kf,kw. (96107)  
55 (impact or impacts).ti. (431710)  
56 health impact.ab,ot,kf,kw. (11841)  
57 consequence\$.ti. (55623)  
58 outcome\$.ti. (623148)  
59 effect.ti. (1047419)  
60 relapse.ti. (26529)  
61 recurrence.ti. (64416)  
62 recurrent disease/ (198128)  
63 exp survival/ (1292864)  
64 survival analysis/ (35655)  
65 or/31-64 (8198897)  
66 ec.fs. (5949893)  
67 (unpaid work or paid work).ti,ab,ot,kf,kw. (1866)  
68 (caregiver\$ or carer\$).ti,ab,ot,kf,kw. (133813)  
69 return to work.ti,ab,ot,kf,kw. (13892)  
70 (wage or wages or income\$ or salary or salaries or welfare or employment or unemployment or job  
or  
career\$).ti,ab,ot,kf,kw. (452266)  
71 exp work/ (397696)  
72 caregiver/ (98516)  
73 private sector/ (3659)  
74 public sector/ (3167)  
75 exp "salary and fringe benefit"/ (34814)

76 economics/ (243670)  
 77 job loss\$.ti,ab,ot,kf,kw. (1504)  
 78 (financial adj2 (ramification\$ or impact\$ or consequence\$ or outcome\$ or effect\$)).ti,ab,ot,kf,kw.  
 (9228)  
 79 work.ti. (95727)  
 80 welfare/ or social welfare/ (28654)  
 81 exp employment/ (112740)  
 82 career mobility/ (10846)  
 83 exp employment status/ (40781)  
 84 social change/ (13156)  
 85 work disabilit\$.ti,ab,ot,kf,kw. (3131)  
 86 (social adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or  
 change\$)).ti,ab,ot,kf,kw. (42536)  
 87 (societ\$ adj2 (impact or impacts or consequence\$ or effect\$ or outcome\$ or  
 change\$)).ti,ab,ot,kf,kw. (6800)  
 88 unemployed.ti,ab,ot,kf,kw. (14353)  
 89 or/66-88 (7203484)  
 90 65 or 89 (13682547)  
 91 30 and 90 (45868)  
 92 exp percutaneous coronary intervention/ (116493)  
 93 ptca.ti,ab,ot,kf,kw. (9108)  
 94 coronary angioplast\$.ti,ab,ot,kf,kw. (17538)  
 95 coronary artery bypass graft/ (80762)  
 96 (coronary adj2 bypass).ti,ab,ot,kf,kw. (70420)  
 97 aortocoronary bypass.ti,ab,ot,kf,kw. (2800)  
 98 exp Prostatectomy/ (64326)  
 99 Prostatectom\$.ti,ab,ot,kf,kw. (55304)  
 100 exp Hysterectomy/ (80537)  
 101 hysterectom\$.ti,ab,ot,kf,kw. (63221)  
 102 hernioplasty/ (19557)  
 103 Herniorrhaph\$.ti,ab,ot,kf,kw. (3210)  
 104 hernioplasty.ti,ab,ot,kf,kw. (2291)  
 105 (hernia adj3 repair\$).ti,ab,ot,kf,kw. (21474)  
 106 hernia operation\$.ti,ab,ot,kf,kw. (523)  
 107 hernia surg\$.ti,ab,ot,kf,kw. (2447)  
 108 (Gallbladder adj2 removal).ti,ab,ot,kf,kw. (278)  
 109 Cholecystectom\$.ti,ab,ot,kf,kw. (44107)  
 110 exp Cholecystectomy/ (54792)  
 111 gallbladder surg\$.ti,ab,ot,kf,kw. (334)  
 112 gallbladder operation\$.ti,ab,ot,kf,kw. (40)  
 113 exp cataract extraction/ (50804)  
 114 cataract extraction\$.ti,ab,ot,kf,kw. (8699)  
 115 cataract surger\$.ti,ab,ot,kf,kw. (26385)  
 116 exp hip Arthroplasty/ (32932)  
 117 hip replacement\$.ti,ab,ot,kf,kw. (18416)  
 118 hip arthroplast\$.ti,ab,ot,kf,kw. (33328)  
 119 (hip prosthesis adj2 implantation\$).ti,ab,ot,kf,kw. (67)

120 exp knee Arthroplasty/ (36398)  
121 knee replacement\$.ti,ab,ot,kf,kw. (15401)  
122 knee arthroplast\$.ti,ab,ot,kf,kw. (34462)  
123 or/92-122 (611269)  
124 91 and 123 (2169)  
125 limit 124 to yr="2011 -Current" (1504)  
126 125 not (letter or editorial or chapter or book or note).pt. (1453)  
127 126 not conference.pt. (937)

**P** **R** **↙** **Partnership for**  
**E** **P** **A** **REsponsive**  
**L** **R** **E** **Policy**  
**Analysis and**  
**REsearch**