

Supplementary File - The Burden of Osteoporosis in Saudi Arabia: A Scorecard and Economic Model

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Appendix S1: Database Search Strategies

Ovid Multifile

Database: Embase <1988 to 2018 Week 01>, Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) <1946 to Present>

Search Strategy:

-
- 1 exp Osteoporosis/ (165703)
 - 2 osteoporo*.tw,kf. (169279)
 - 3 bone loss*.tw,kf. (58197)
 - 4 Bone Density/ (133563)
 - 5 (bone? adj3 densit*).tw,kf. (120995)
 - 6 bmd.tw,kf. (70147)
 - 7 Bone Diseases, Metabolic/ (9391)
 - 8 Bone Demineralization, Pathologic/ (2467)
 - 9 (bone? adj3 (calcifi* or deminerali*)).tw,kf. (9768)
 - 10 or/1-9 [OSTEOPOROSIS] (347408)
 - 11 Saudi Arabia/ (28321)
 - 12 saudi arabia?.tw,kf,cp,gc,hw,in. (153849)
 - 13 United Arab Emirates/ (4284)
 - 14 (Emirates or United Arab Emirat* or UAE).tw,kf,cp,gc,hw,in. (55876)
 - 15 (Abu Dhabi or Ajman or Dubai or Fujairah or Ras al-Khaimah or Sharjah or Trucial State? or Umm al-Quwain).tw,kf,cp,gc,hw,in. (15757)
 - 16 Morocco/ (11102)
 - 17 (Morocco or Moroccan).tw,kf,cp,gc,hw,in. (41918)
 - 18 Ifni.tw,kf,cp,gc,hw,in. (50)
 - 19 Turkey/ (36193)
 - 20 (Turkey or Turkish).tw,kf,cp,gc,hw,in. (618411)
 - 21 Istanbul.tw,kf,cp,gc,hw,in. (143020)
 - 22 Egypt/ (30137)
 - 23 Egypt*.tw,kf,cp,gc,hw,in. (200657)
 - 24 United Arab Republic.tw,kf,cp,gc,hw,in. (42)
 - 25 or/11-24 [COUNTRIES OF INTEREST] (1038726)
 - 26 10 and 25 [OSTEOPOROSIS - COUNTRIES OF INTEREST] (9873)
 - 27 exp ANIMALS/ not (exp ANIMALS/ and HUMANS/) (13910517)
 - 28 26 not 27 [ANIMAL-ONLY REMOVED] (6356)
 - 29 (comment or editorial or news or newspaper article).pt. (1815743)
 - 30 (letter not (letter and randomized controlled trial)).pt. (1927924)
 - 31 28 not (29 or 30) [OPINION PIECES REMOVED] (6127)
 - 32 limit 31 to english (5750)
 - 33 32 use ppez [MEDLINE RECORDS] (3189)
 - 34 exp osteoporosis/ (165703)
 - 35 osteoporo*.tw,kw. (175483)
 - 36 bone loss*.tw,kw. (58607)
 - 37 bone density/ (133563)
 - 38 (bone? adj3 densit*).tw,kw. (122233)
 - 39 bmd.tw,kw. (70408)
 - 40 metabolic bone disease/ (11697)

41 bone demineralization/ (2370)
 42 (bone? adj3 (calcifi* or deminerali*)).tw,kw. (9830)
 43 or/34-42 [OSTEOPOROSIS] (350563)
 44 Saudi Arabia/ (28321)
 45 saudi arabia?.tw,kw,cp,gc,hw,in. (153852)
 46 exp United Arab Emirates/ (4683)
 47 (Emirates or United Arab Emirat* or UAE).tw,kw,cp,gc,hw,in. (55907)
 48 (Abu Dhabi or Ajman or Dubai or Fujairah or Ras al-Khaimah or Sharjah or Trucial State? or Umm al-
 Quwain).tw,kw,cp,gc,hw,in. (15761)
 49 Morocco/ (11102)
 50 (Morocco or Moroccan).tw,kw,cp,gc,hw,in. (41923)
 51 Ifni.tw,kw,cp,gc,hw,in. (50)
 52 "Turkey (republic)"/ (30754)
 53 (Turkey or Turkish).tw,kw,cp,gc,hw,in. (618448)
 54 Istanbul.tw,kw,cp,gc,hw,in. (143022)
 55 Egypt/ (30137)
 56 Egypt*.tw,kw,cp,gc,hw,in. (200677)
 57 United Arab Republic.tw,kw,cp,gc,hw,in. (42)
 58 or/44-57 [COUNTRIES OF INTEREST] (1038813)
 59 43 and 58 [OSTEOPOROSIS - COUNTRIES OF INTEREST] (9978)
 60 exp animal experimentation/ or exp animal model/ or exp animal experiment/ or nonhuman/ or
 exp vertebrate/ (43229928)
 61 exp human/ or exp human experimentation/ or exp human experiment/ (34673113)
 62 60 not 61 (8558015)
 63 59 not 62 [ANIMAL-ONLY REMOVED] (8934)
 64 editorial.pt. (1007428)
 65 letter.pt. not (letter.pt. and randomized controlled trial/) (1923323)
 66 63 not (64 or 65) [OPINION PIECES REMOVED] (8624)
 67 conference abstract.pt. (2834045)
 68 66 not 67 [CONFERENCE ABSTRACTS REMOVED] (7214)
 69 limit 68 to english (6707)
 70 69 use emed [EMBASE RECORDS] (3517)
 71 33 or 70 [BOTH DATABASES] (6706)
 72 limit 71 to yr="2010-current" (4062)
 73 remove duplicates from 72 (2647) [TOTAL UNIQUE RECORDS]
 74 73 use ppez [MEDLINE UNIQUE RECORDS] (1675)
 75 73 use emed [EMBASE UNIQUE RECORDS] (972)

Cochrane Library

Search Name: Osteoporosis - Arab Countries

Date Run: 03/01/18 00:48:04.49

Description: 2018 Jan 2 – Final - Conference abstracts removed

ID	Search	Hits
#1	[mh Osteoporosis]	3593
#2	osteoporo*:ti,ab,kw	7544
#3	(bone next loss*):ti,ab,kw	3432
#4	[mh "Bone Density"]	4545
#5	(bone* near/3 densit*):ti,ab,kw	8563

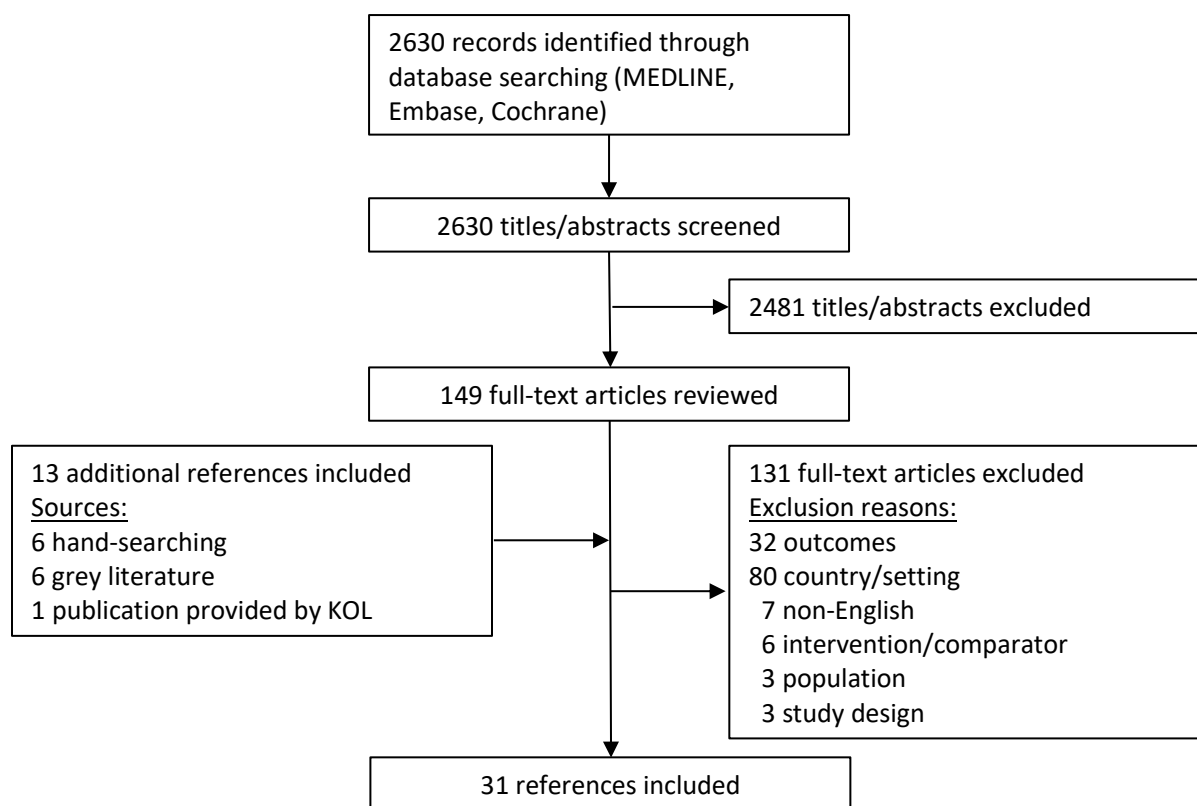
#6 bmd:ti,ab,kw 4038
 #7 [mh ^"Bone Diseases, Metabolic"] 327
 #8 [mh ^"Bone Demineralization, Pathologic"] 12
 #9 (bone* near/3 (calcifi* or deminerali*)):ti,ab,kw 300
 #10 {or #1-#9} 13699
 #11 [mh "Saudi Arabia"] 156
 #12 (saudi next arabia*):ti,ab,kw 547
 #13 [mh "United Arab Emirates"] 20
 #14 (Emirates or ("United Arab" next Emirat*) or UAE):ti,ab,kw 391
 #15 ("Abu Dhabi" or Ajman or Dubai or Fujairah or "Ras al-Khaimah" or Sharjah or (Trucial next State?) or "Umm al-Quwain"):ti,ab,kw 26
 #16 [mh Morocco] 34
 #17 (Morocco or Moroccan):ti,ab,kw 97
 #18 Ifni:ti,ab,kw 0
 #19 [mh Turkey] 706
 #20 (Turkey or Turkish):ti,ab,kw 2052
 #21 Istanbul:ti,ab,kw 213
 #22 [mh Egypt] 315
 #23 Egypt*:ti,ab,kw 1214
 #24 "United Arab Republic":ti,ab,kw 0
 #25 {or #11-#24} 4258
 #26 #10 and #25 30
 #27 Conference Abstract:pt 96419
 #28 #26 not #27 Publication Year from 2010 to 2017 18

DSR – 1

CENTRAL – 17

Appendix S2: PRISMA

Figure S1. PRISMA flow diagram of study selection



Appendix S3: Model Inputs

Additional inputs used in the burden of illness model are listed below along with the primary references for each input. Note, the costs have been inflated and are shown in both 2019 Saudi Riyal (SR) and United States Dollars (\$ USD).

Table S1. Input values and references for Saudi Arabia burden of illness model

Input Description	Input Value	Reference
Hospital per diem	SR974 \$260 USD	World Health Organization 2008 ¹
Hospital length of stay (hip fractures)	23.28 days	Sadat-Ali et al. 2015 ²
Hospital length of stay (vertebral fractures)	10.8 days	Joestl et al. 2017 ³
Hospital length of stay (wrist fractures)	1 day	Opinion Leaders, assumption of same day discharge
Hospital length of stay (other fractures)	3 days	Opinion Leaders
Testing cost	SR3,257 \$869 USD	Bubshait & Sadat-Ali 2007 ^{4*}
Surgery cost	SR18,567 \$4,951 USD	Bubshait & Sadat-Ali 2007 ^{4*}
Prescription drug cost per patient	SR5,733 \$1,529 USD	Bubshait & Sadat-Ali 2007 ^{4*}

* Due to its publication date (2007), this BOI investigation was not captured in our initial database search which excluded publications prior to 2010.⁴ However, through hand-searching, this BOI investigation was determined to be the most reliable source of primary cost data for Saudi Arabia.⁴ Thus, we decided to include it in our final review.⁴ We believe this is justified as it is well recognized that the model development process generates multiple complex information needs that require information drawn from a wide range of sources to be fulfilled.⁵

References

- ¹World Health Organization (2008). *Country-specific unit costs*. Available online at: http://www.who.int/choice/country/country_specific/en/. Accessed: March 29, 2018.
- ²Sadat-Ali M, Al-Dakheel DA, Azam MQ, Al-Bluwi MT, Al-Farhan MF et al. (2015) Reassessment of osteoporosis-related femoral fractures and economic burden in Saudi Arabia. *Arch Osteoporos* 10 (37).
- ³Joestl J, Lang N, Bukaty A, Tiefenboeck TM, Platzer P (2017) Osteoporosis associated vertebral fractures-Health economic implications. *PLoS One* 12 (5): e0178209.
- ⁴Bubshait D, Sadat-Ali M (2007) Economic implications of osteoporosis-related femoral fractures in Saudi Arabian society. *Calcif Tissue Int* 81 (6): 455-458.
- ⁵Kaltenthaler E, Tappende P, Paisley S, Squires H (2011). *NICE DSU Technical Support Document 13: Identifying and reviewing evidence to inform the conceptualisation and population of cost-effectiveness models*. Sheffield, UK Available online at: <http://nicedsu.org.uk/wp-content/uploads/2016/03/TSD-13-model-parameters.pdf>. Accessed: January 8, 2019.