

Online Supplementary Document

Dowman et al. Estimating the burden of rheumatoid arthritis in Africa: A systematic analysis

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Appendix 1: Data extracted from population-based studies

Appendix 2: Data extracted from hospital-based studies

Appendix 3: Data distribution by age-groups before weighting

Appendix 4: Graphs presenting data distribution

Appendix 5: Estimates of prevalence with 95% confidence intervals

Appendix 6: Burden of disease for African population using UNPD demographic data

Appendix 1: Data extracted from population-based studies

Truswell AS, Hansen JDL. (1968)				
Combined				
age distribution	mean age	cohort size	No. RA	prevalence
<20	10	72	0	0
20-60	40	68	0	0
60-72	66	15	0	0
total		154	0	0

Muller AS, Valkenburg HA, Greenwood BM. (1972)				
Combined. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
25-34	29.5	173	1	0.58
35-44	39.5	176	5	2.84
45-54	49.5	134	1	0.75
55+	62	124	8	6.35
total		607	15	2.47
Male. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
25-34	29.5	81	0	0
35-44	39.5	86	3	3.5
45-54	49.5	64	1	1.6
55+	62	64	5	7.8
total		295	9	3.1
Female. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
25-34	29.5	92	1	1.1
35-44	39.5	90	2	2.2
45-54	49.5	70	0	0
55+	62	60	3	5
total		312	6	1.9

Beighton P, Solomon L, Vakenburg HA. (1975)				
Combined. Rome				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	380	0	0
25-34	29.5	50	0	0
35-44	39.5	51	0	0
45-54	49.5	66	1	1.51
55-64	59.5	105	2	1.9
65-74	69.5	85	1	1.18
75+	77.5	64	3	4.69
total		801	7	0.87
Male. Rome				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	182	0	0
25-34	29.5	17	0	0
35-44	39.5	18	0	0
45-54	49.5	20	1	5
55-64	59.5	31	2	6.5
65-74	69.5	24	1	4.2
75+	77.5	19	1	5.3
total		311	5	1.6
Female. Rome				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	198	0	0
25-34	29.5	33	0	0
35-44	39.5	33	0	0
45-54	49.5	46	0	0
55-64	59.5	74	0	0
65-74	69.5	61	0	0
75+	77.5	45	2	4.4
total		490	2	0.4

Solomon L, Robin G, Valkenburg HA. (1975)				
Combined. Rome				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	179	0	0
25-34	29.5	99	0	0
35-44	39.5	65	2	3.08
45-54	49.5	52	2	3.85
55-64	59.5	67	4	6.25
65-74	69.5	64	8	12.5
75+	77.5	25	2	8
total		551	18	3.3
Male. Rome				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	70	0	0
25-34	29.5	34	0	0
35-44	39.5	25	2	8
45-54	49.5	16	1	6.3
55-64	59.5	23	0	0
65-74	69.5	21	2	9.5
75+	77.5	8	0	0
total		197	5	2.6
Female. Rome				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	109	0	0
25-34	29.5	65	0	0
35-44	39.5	40	0	0
45-54	49.5	36	1	2.8
55-64	59.5	44	4	9.1
65-74	69.5	43	6	14
75+	77.5	17	2	11.8
total		354	13	3.7

Meyers OL, Daynes G, Beighton P. (1977)				
Combined. Rome w/ ARA exclusion criteria				
age distribution	mean age	cohort size	No. RA	prevalence
18+	36	433	10	2.3
total		433	10	2.3

Meyers OL, Jessop S, Klemp P. (1982)				
Combined. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
65+	71.9	127	1	0.79
total		127	1	0.79

Meyers OL, Jessop S, Klemp P. (1982)				
Combined. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
65+	71.9	35	2	5.71
total		35	2	5.71

Moolenburgh JD, Valkenburg HA, Fourie PB. (1986)				
Combined. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	325	0	0
25-34	29.5	167	0	0
35-44	39.5	130	0	0
45-54	49.5	150	4	2.67
55-64	59.5	148	6	4.05
65-74	69.5	73	4	5.48
75+	82.1	60	2	8.33
total		1070	16	1.8
Male. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	96	0	0
25-34	29.5	19	0	0
35-44	39.5	27	0	0
45-54	49.5	37	0	0
55-64	59.5	50	2	4
65-74	69.5	25	0	0
75+	82.6	23	0	0
total		280	2	1.8
Female. ARA				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	229	0	0
25-34	29.5	150	0	0
35-44	39.5	103	0	0
45-54	49.5	113	4	3.5
55-64	59.5	98	4	4.1
65-74	69.5	58	4	6.9
75+	82.2	37	2	5.4
total		790	14	1.8

Brighton SW, de la Harpe AL, van Staden DJ, Badenhorst JH, Myers OL. (1988)				
Combined. Rome				
age distribution	mean age	cohort size	No. RA	prevalence
18-30	24	151	0	0
31-40	35.5	203	0	0
41-50	45.5	129	0	0
51+	57.5	60	0	0
total		543	0	0

Silman AJ, Ollier W, Holligan S, Birrell F, Adebajo A, Asuzu MC, Thomson W, Peeper L. (1994)				
Combined. ACR				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	574	0	0
25-34	29.5	369	0	0
35-44	39.5	293	0	0
45-54	49.5	258	0	0
55-64	59.5	134	0	0
65-74	69.5	192	0	0
75+	79.5	60	0	0
total		1994	0	0
Male. ACR				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	248	0	0
25-34	29.5	139	0	0
35-44	39.5	98	0	0
45-54	49.5	92	0	0
55-64	59.5	84	0	0
65-74	69.5	70	0	0
75+	79.1	23	0	0
total		757	0	0
Female. ACR				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	326	0	0
25-34	29.5	230	0	0
35-44	39.5	195	0	0
45-54	49.5	166	0	0
55-64	59.5	150	0	0
65-74	69.5	122	0	0
75+	79.7	37	0	0
total		1237	0	0

Abdel-Nasser A, Abdel-Tawab R, Mahmoud J, Sammy A, Abdel-Fattah M. (2009)				
Combined. ACR				
age distribution	mean age	cohort size	No. RA	prevalence
15+	37	5120	18	0.35
total		5120	18	0.35
Male. ACR				
age distribution	mean age	cohort size	No. RA	prevalence
15+	33.6	2558	3	0.12
total		2558	3	0.12
Female. ACR				
age distribution	mean age	cohort size	No. RA	prevalence
15+	39	2562	15	0.47
total		2562	15	0.47

Appendix 2: Data extracted from hospital-based studies

Shaper AG, Shaper L (1958) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	prevalence
30-44	37	2845	5	0.0018
total		2845	5	0.0018

Greenwood BM (1968) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	prevalence
15-44	29.5	41798	32	0.08
45-64	54.5	11421	10	0.09
total		98454*	42	0.04

* Total population includes age groups outside age distribution. Not broken down in separate age groups in study

Greenwood BM (1969) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	prevalence
	34.2	67377	35	0.05
total		67377	35	0.05

Anderson IF (1970) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	prevalence
21-30	25.5	10503	6	0.06
31-40	35.5	7827	7	0.09
41-50	45.5	5753	3	0.05
51-60	55.5	4014	3	0.07
61+	68.9	3680	4	0.11
total		66900*	23	0.03

* Total population includes age groups outside age distribution. Not broken down in separate age groups in study

Edginton ME, Hodkinson J, Seftel HC (1972) - Rural				
combined				
age distribution	mean age	cohort size	No. RA	prevalence
10-20	15.00	81	0	0
21-30	25.50	124	1	0.81
31-40	35.5	129	0	0
41-50	45.5	102	2	1.96
51-60	55.5	54	0	0
61+	68.9	43	0	0
total		533	3	0.56

Tsega E, Choremi H, Bottazzo GF, Doniach D (1980) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	prevalence
†	21.9	7966	19	0.24
total		7966	19	0.24

† Age groups not given. Estimation of mean age from UNPD data

Moolenburgh JD, Moore S, Valkenburg HA, Rasmus MG. (1984) - Rural				
combined				
age distribution	mean age	cohort size	No. RA	prevalence
15-24	19.5	5046	2	0.04
25-34	29.5	4698	8	0.17
35-44	39.5	2262	5	0.22
45-54	49.5	1566	8	0.51
55-64	59.5	1218	5	0.41
65+	72.8	1044	4	0.38
total		15834	32	0.2

Brighton SW, de la Harpe AL, van Staden DJ, Badenhorst JH, Myers OL (1988) - Rural				
combined				
age distribution	mean age	cohort size	No. RA	Prevalence
*	22.3	255740	14	0.0055
total		255740	14	0.0055

* Age groups not given. Estimation of mean age from UNPD data

Bwanahali K, Mbuyi M, Kapita B (1991) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	Prevalence
11-20	15.5	420	1	0.24
21-30	25.5	791	4	0.51
31-40	35.5	664	4	0.6
41-50	45.5	459	1	0.22
51-60	55.5	230	1	0.43
61-70	65.5	107	0	0
71+	75.6	30	0	0
total		2701	11	0.41
male				
age distribution	mean age	cohort size	No. RA	Prevalence
11-20	15.50	152	0	0
21-30	25.5	419	1	0.2
31-40	35.5	305	2	0.66
41-50	45.5	221	0	0
51-60	55.50	133	0	0
61-70	65.5	52	0	0
71+	72.5	13	0	0
total		1295	3	0.23
female				
age distribution	mean age	cohort size	No. RA	Prevalence
11-20	15.5	268	1	0.37
21-30	25.5	372	3	0.81
31-40	35.5	359	2	0.84
41-50	45.5	238	1	1.03
51-60	55.5	97	1	1.82
61-70	65.5	55	0	0
71+	75.7	17	0	0
total		1406	8	0.57

Bileckot R, Malonga AC (1998) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	Prevalence
23-65	43.5	3518	36	1.02
total		3518	36	1.02

Malemba JJ, Mbuyi-Muamba JM (2007) - Urban				
combined				
age distribution	mean age	cohort size	No. RA	Prevalence
*	45.3	19587	82	0.49
total		19587	82	0.49
male				
age distribution	mean age	cohort size	No. RA	Prevalence
*	44.3	9753	22	0.23
total		9753	22	0.23
FEMALE				
age distribution	mean age	cohort size	No. RA	Prevalence
*	46.5	9852	60	0.61
total		9852	60	0.61

* Age groups not given. Estimation of mean age from UNPD data

Appendix 3: Data distribution by age -groups before weighting

Population studies: both sexes

AGE	Prevalence	Cohort size
10	0	72
19.5	0	380*
19.5	0	179
19.5	0	325
19.5	0	574
24	0	151
29.5	0	167
29.5	0	99
29.5	0	50
29.5	0.58	173
29.5	0	369
35.5	0	203
36	2.3	433
37	0.35	5120
39.5	2.84	176
39.5	0	51
39.5	3.08	65
39.5	0	130
39.5	0	293
40	0	68
45.5	0	129
49.5	0.75	134
49.5	1.51	66
49.5	3.85	52
49.5	2.67	150
49.5	0	258
57.5	0	60
59.5	4.05	148
59.5	6.25	67
59.5	1.9	105
59.5	0	134
62	6.35	126
66	0	15
69.5	1.18	85
69.5	12.5	64
69.5	5.48	73
69.5	0	192
71.9	0.79	127

71.9	5.71	35
77.5	8	25
77.5	4.69	64
79.5	0	60
82.1	8.33	60

Population studies: females only

AGE	Prevalence	Cohort size
19.5	0	182
19.5	0	70
19.5	0	96
19.5	0	248
29.5	0	139
29.5	0	19
29.5	0	34
29.5	0	17
29.5	0	81
33.6	0.12	2558
39.5	0	27
39.5	3.5	86
39.5	0	18
39.5	8	25
39.5	0	98
49.5	0	92
49.5	6.3	16
49.5	5	20
49.5	1.6	64
49.5	0	37
59.5	4	50
59.5	6.5	31
59.5	0	23
59.5	0	84
62	7.8	64
69.5	4.2	24
69.5	9.5	21
69.5	0	25
69.5	0	70
77.5	0	8
77.5	5.3	19
79.1	0	23
82.6	13	23

Population studies: males only

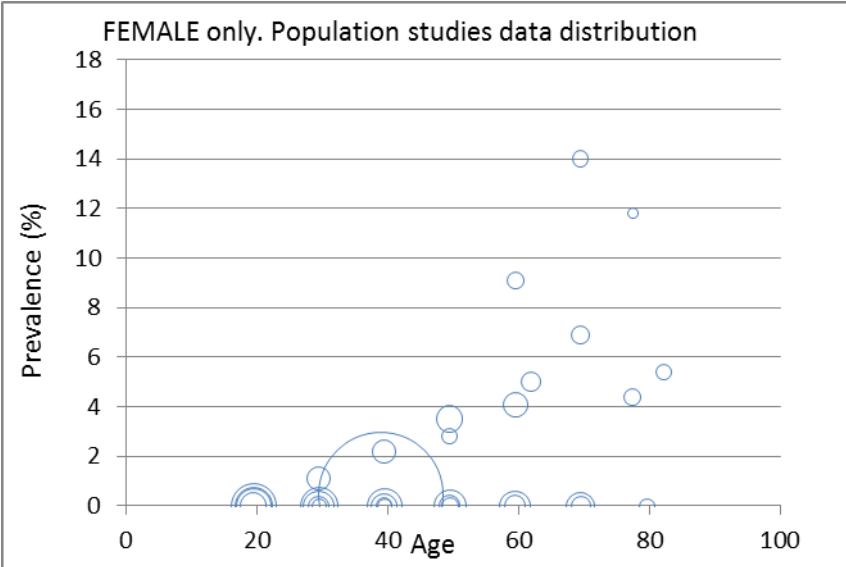
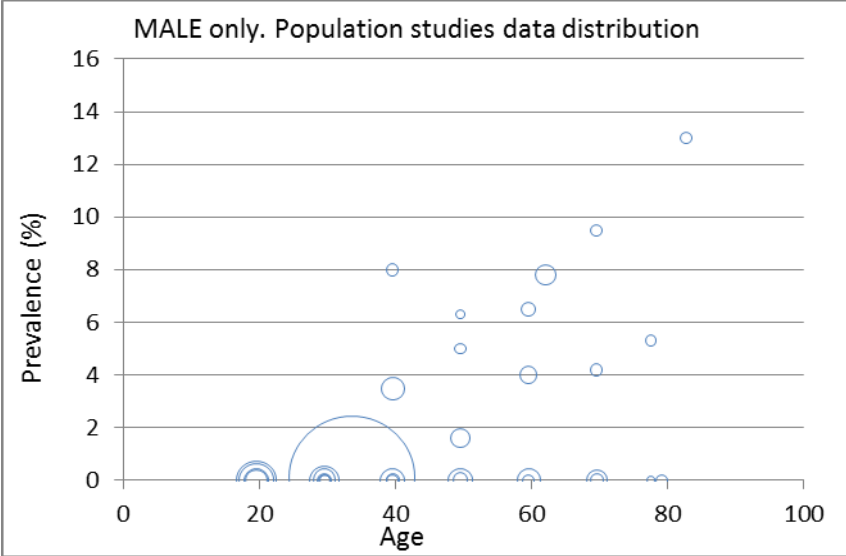
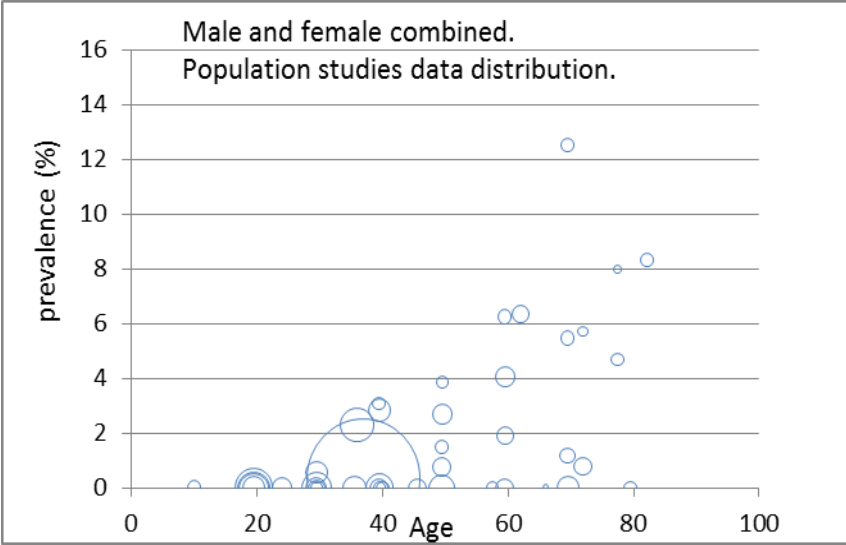
AGE	Prevalence	Cohort size
19.5	0	198
19.5	0	109
19.5	0	229
19.5	0	326
29.5	0	230
29.5	0	150
29.5	0	65
29.5	0	33
29.5	1.1	92
39	0.47	2562
39.5	2.2	90
39.5	0	33
39.5	0	40
39.5	0	103
39.5	0	195
49.5	0	166
49.5	3.5	113
49.5	2.8	36
49.5	0	46
49.5	0	70
59.5	0	74
59.5	9.1	44
59.5	4.1	98
59.5	0	150
62	5	60
69.5	0	122
69.5	0	61
69.5	14	43
69.5	6.9	58
77.5	11.8	17
77.5	4.4	45
79.7	0	37
82.2	5.4	37

Hospital studies: both sexes

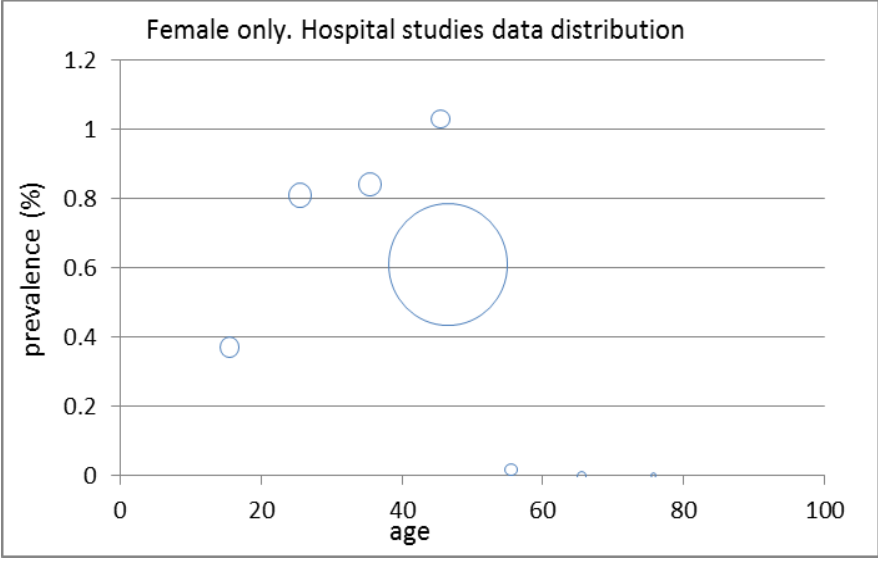
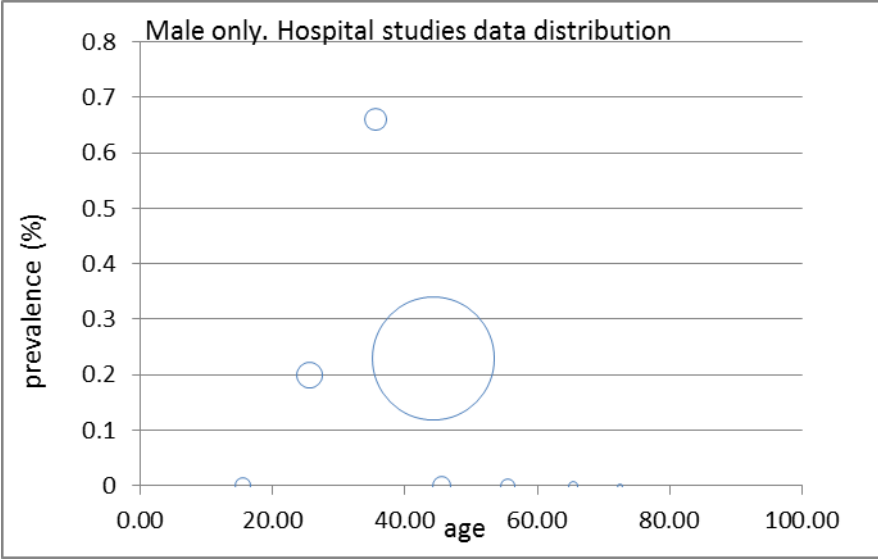
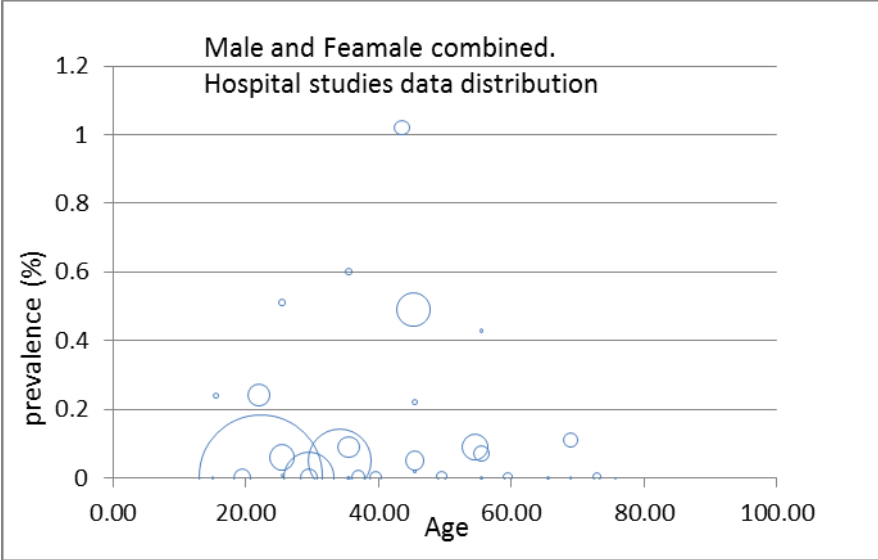
AGE	Prevalence	Cohort size
15.5	0.24	420
19.5	0	179
21.9	0.24	7966
25.5	0.06	10503
25.5	0.51	791
29.5	0	99
29.5	0.08%	41798
34.2	0.05	67377
35.5	0.6	664
35.5	0.09	7827
37	0.0018	2845
39.5	3.08	65
43.5	1.02	3518
45.3	0.49	19587
45.5	0.05	5753
45.5	0.22	459
49.5	3.85	52
54.5	0.09	11421
55.5	0.43	230
55.5	0.07	4014
59.5	6.25	67
65.5	0	107
68.9	0.11	3680
69.5	12.5	64
71.9	5.71	35
75.6	0	30
77.5	8	25

Appendix 4: Graphs presenting data distribution

Population studies:



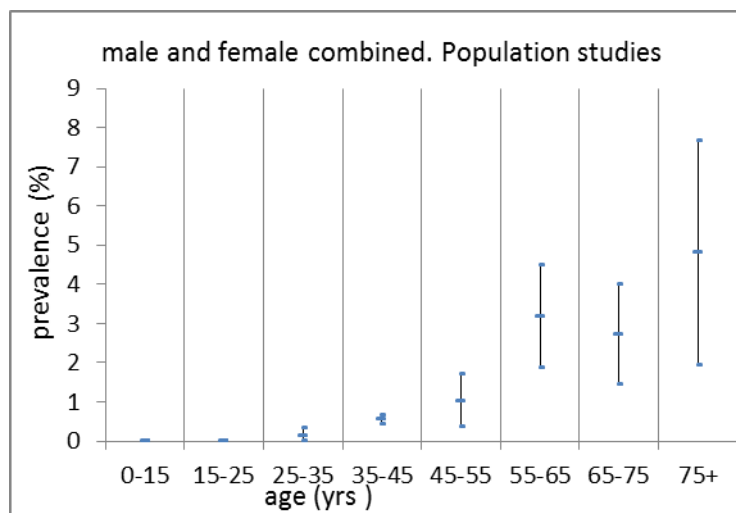
Hospital studies:



Appendix 5: Estimates of prevalence with 95% confidence intervals*

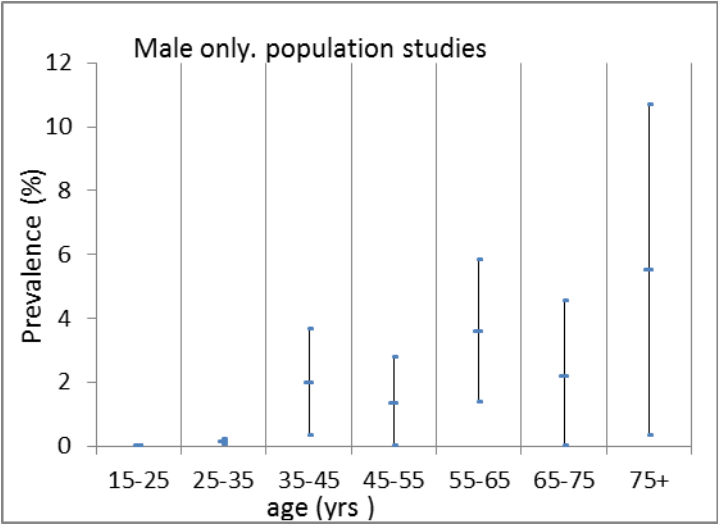
Population-based studies: both sexes

Age (years)	Prevalence (%)	cohort size	Confidence intervals 95%	
0-15	0	72	0	0
15-25	0	1609	0	0
25-35	0.117	858	0	0.305
35-45	0.533	6539	0.418	0.648
45-55	1.015	789	0.340	1.690
55-65	3.152	640	1.837	4.467
65-75	2.708	591	1.434	3.982
75+	4.784	209	1.917	7.651



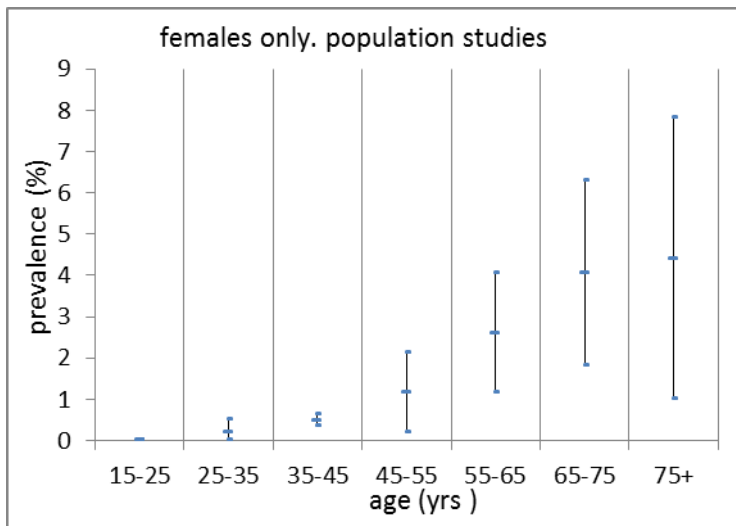
Population-based studies: males only

Age (years)	Prevalence (%)	cohort size	Confidence intervals 95%	
15-25	0	596	0	0
25-35	0.11	2848	0.04	0.18
35-45	1.97	254	0.31	3.63
45-55	1.32	229	0	2.76
55-65	3.57	252	1.35	5.79
65-75	2.15	140	0	4.51
75+	5.48	73	0.30	10.66



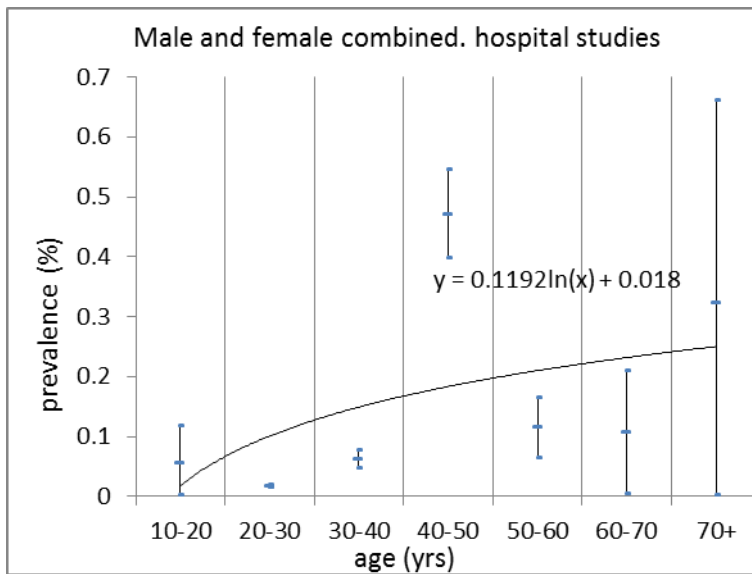
Age (years)	Prevalence (%)	cohort size	Confidence intervals 95%	
15-25	0	862	0	0
25-35	0.18	570	0	0.51
35-45	0.46	3023	0.35	0.63
45-55	1.15	431	0.18	2.12
55-65	2.59	426	1.14	4.04
65-75	4.04	284	1.81	6.27
75+	4.4	136	0.99	7.81

Population-based studies: females only



Hospital-based studies: both sexes

Age (years)	Prevalence (%)	cohort size	Confidence intervals 95%	
15-25	0	862	0	0
25-35	0.18	570	0	0.51
35-45	0.46	3023	0.35	0.63
45-55	1.15	431	0.18	2.12
55-65	2.59	426	1.14	4.04
65-75	4.04	284	1.81	6.27
75+	4.4	136	0.99	7.81



Appendix 6: Burden of disease for African population using UNPD demographic data

Burden of RA in the year 1990 - both sexes

age	burden of diseases	population of age group UNPD 1990
0-14	0	282,352,000
15-24	0	122,399,000
25-34	99,892	85,378,000
35-44	312,155	58,603,000
45-54	404,853	39,887,000
55-64	847,320	26,882,000
65-74	389,518	14,384,000
75+	258,383	5,401,000
total	2,311,124	635,287,000

Burden of RA in the year 2010 - both sexes

Age (years)	Burden of disease to the nearest 1000	Prevalence (%)	Population by UNPD 2010
0-14	0	0	411,728,000
15-24	0	0	205,355,000
25-34	179,000	0.117	153,166,000
35-44	537,000	0.533	100,750,000
45-54	705,000	1.015	69,492,000
55-64	1,443,000	3.152	45,793,000
65-74	683,000	2.708	25,213,000
75+	725,000	4.784	15,162,000
total	4,272,000	0.416	1,026,639,000