

Table S3: Characteristics of studies included

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| Author | Afzal 2014 |
| Design | cohort |
| Cohort name | Copenhagen City Heart Study & Copenhagen General Population Study |
| Number of cohorts | 2 |
| Country | Denmark |
| Enrollment year | <i>Copenhagen City Heart Study 1976-1978</i> <i>Copenhagen General Population Study 2003</i> |
| Baseline year | <i>Copenhagen City Heart Study 1981-1983</i> <i>Copenhagen General Population Study 2004-2005</i> |
| No. Enrolled | <i>Copenhagen City Heart Study</i> |
| Total participants included (% females) | No. of enrolled 10116 Total included 10116 (F 56,2%) <i>Copenhagen General Population Study</i> No. of enrolled 8391 Total included 8391 (F 53%) |
| Mean age (range / SD) | <i>Copenhagen City Heart Study</i> Age 58 (47 - 64) <i>Copenhagen General Population Study</i> Age 56 (46 - 66) |
| Follow-up (years) | <i>Copenhagen City Heart Study</i> 20 years from baseline <i>Copenhagen General Population Study</i> 5 years from baseline |
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| Author | Afzal 2013 |
| Design | cohort |
| Cohort name | Copenhagen City Heart Study |
| Number of cohorts | 1 |

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| Country | Denmark |
| Enrollment year | 1981–1983 |
| Baseline year | 1981–1983 |
| No. Enrolled | No. of enrolled 10060 |
| Total participants included (% females) | Total included 10060 (F 56,2%) |
| Mean age (range / SD) | Age 58 (48 - 65) |
| Follow-up (years) | 20 years from baseline |
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| Author | Al-khalidi 2019 |
| Design | cohort |
| Cohort name | Third National Health and Nutrition Examination Survey (NHANES III) |
| Number of cohorts | 1 |
| Country | USA |
| Enrollment year | 1988-1994 |
| Baseline year | 1988–1994 |
| No. Enrolled | No. of enrolled 33994 |
| Total participants included (% females) | Total included 6896 (F n.a.) |
| Mean age (range / SD) | Age 61.1 (13.9) |
| Follow-up (years) | 17.9 years from baseline |
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| Author | Arabi 2012 |
| Design | cohort |
| Cohort name | Lebanese cohort |
| Number of cohorts | 1 |
| Country | Lebanon |
| Enrollment year | 2002-2003 |
| Baseline year | 2002-2003 |
| No. Enrolled | No. of enrolled 195 |
| Total participants included (% females) | Total included 192 (F 66,7%) |
| Mean age (range / SD) | Age 72.3 (5.1) |

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| Follow-up (years) | 4 years from baseline |
| Author | Aregbesola 2013 |
| Design | cohort |
| Cohort name | Kuopio Ischaemic Heart Disease Risk Factor Study (KIHD) |
| Number of cohorts | 2 |
| Country | Finland |
| Enrollment year | 1516 men aged 42, 48, 54 or 60 years enrolled in 1986–1989 + random sample of 920 postmenopausal women aged 53–73 years from the same area |
| Baseline year | 1998-2001 |
| No. Enrolled | No. of enrolled 2436 |
| Total participants included (% females) | Total included 1421 (F 49,1%) |
| Mean age (range / SD) | Age 62.5 (53-73) |
| Follow-up (years) | 9.8 years from baseline |
| Author | Barrett-Connor 2012 |
| Design | cohort |
| Cohort name | Osteoporotic Fractures in Men Study (MrOS) |
| Number of cohorts | 1 |
| Country | USA |
| Enrollment year | 2000-2002 |
| Baseline year | 2000-2002 |
| No. Enrolled | No. of enrolled 5994 |
| Total participants included (% females) | Total included 1468 (F 0%) |
| Mean age (range / SD) | Age 74 (5.7) |
| Follow-up (years) | 4.7 years from baseline |
| Author | Brøndum-Jacobsen 2012 |
| Design | cohort |

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| Cohort name | Copenhagen City Heart Study |
| Number of cohorts | 1 |
| Country | Denmark |
| Enrollment year | 1976-1978 |
| Baseline year | 1981–1983 |
| No. Enrolled | No. of enrolled 12698 |
| Total participants included (% females) | Total included 10170 (F 56%) |
| Mean age (range / SD) | Age 57 (49-66) |
| Follow-up (years) | 21 years from baseline |
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| Author | Cauley 2010 |
| Design | case-cohort |
| Cohort name | Osteoporotic Fractures in Men Study (MrOS) |
| Number of cohorts | 1 |
| Country | USA |
| Enrollment year | 2000-2002 |
| Baseline year | 2000-2002 |
| No. Enrolled | No. of enrolled 5995 |
| Total participants included (% females) | Total included 1606 (F 0%) Total sample for the non-spine fracture analysis (1929 men, 1494 subcohort and 435 fracture cases) Total sample for hip fracture analysis (1665 men, 1584 subcohort and 81 hip fracture cases) |
| Mean age (range / SD) | Age 73.8 (5.9) |
| Follow-up (years) | 5.3 years from baseline |
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| Author | Heath 2017 |
| Design | case-cohort |
| Cohort name | Melbourne Collaborative Cohort Study (MCCS) |
| Number of cohorts | 1 |
| Country | Australia |
| Enrollment year | 1990-1994 |

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| Baseline year | 1990-1994 |
| No. Enrolled | No. of enrolled 41514 |
| Total participants included (% females) | Total included 4964 (F 46,5%) Cases 2410 Sub-cohort of controls 2996 |
| Mean age (range / SD) | Age 54.5 (40-69) |
| Follow-up (years) | 13.7 years from baseline |
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| Author | Hirani 2018 |
| Design | cohort |
| Cohort name | Concord Health and Aging in Men Project (CHAMP) |
| Number of cohorts | 1 |
| Country | Australia |
| Enrollment year | 2005-2007 |
| Baseline year | 2005-2007 |
| No. Enrolled | No. of enrolled 1705 |
| Total participants included (% females) | Total included 1705 (F 0%) |
| Mean age (range / SD) | Age 77.8 (4.6) |
| Follow-up (years) | 5 years from baseline |
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| Author | Holmberg 2017 |
| Design | nested case-control |
| Cohort name | Swedish farmers study |
| Number of cohorts | 1 |
| Country | Sweden |
| Enrollment year | 1989 |
| Baseline year | 1990-1991 |
| No. Enrolled | No. of enrolled 2350 |
| Total participants included (% females) | Total included 529 (F 0%) Cases 276 |

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| | Controls 276 |
| Mean age (range / SD) | Age 51.5 (n.a.) |
| Follow-up (years) | 20 years from baseline |
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| Author | Jassal 2010 |
| Design | cohort |
| Cohort name | The Rancho Bernardo Study |
| Number of cohorts | 1 |
| Country | USA |
| Enrollment year | 1972 |
| Baseline year | 1997-1999 |
| No. Enrolled | No. of enrolled 2062 |
| Total participants included (% females) | Total included 1073 (F 61,7%) |
| Mean age (range / SD) | Age 74 (10) |
| Follow-up (years) | 6.8 years from baseline |
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| Author | Khaw 2014 |
| Design | cohort |
| Cohort name | EPIC cohort |
| Number of cohorts | 1 |
| Country | UK |
| Enrollment year | 1993-1997 |
| Baseline year | 1997-2000 |
| No. Enrolled | No. of enrolled 25639 |
| Total participants included (% females) | Total included 14641 (F 55,7%) |
| Mean age (range / SD) | Age 62.9 (9) |
| Follow-up (years) | 13 years from baseline |
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| Author | Licher 2017 |

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| Design | cohort |
| Cohort name | The Rotterdam Study (RS-I-3) & The Rotterdam Study (RS-II-1) |
| Number of cohorts | 2 |
| Country | Netherland |
| Enrollment year | <i>The Rotterdam Study (RS-I-3)</i> 1990 <i>The Rotterdam Study (RS-II-1)</i> 2000 |
| Baseline year | <i>The Rotterdam Study (RS-I-3)</i> 1997-1999 <i>The Rotterdam Study (RS-II-1)</i> 2000-2001 |
| No. Enrolled | <i>The Rotterdam Study (RS-I-3)</i> |
| Total participants included (% females) | No. of enrolled 7983 Total included 3043,5 (F 56,9%) <i>The Rotterdam Study (RS-II-1)</i> No. of enrolled 3011 Total included 3043,5 (F 56,9%) |
| Mean age (range / SD) | Age 69.2 (8.2) |
| Follow-up (years) | 15 years from baseline |
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| Author | Liu 2012 |
| Design | cohort |
| Cohort name | Third National Health and Nutrition Examination Survey (NHANES III) |
| Number of cohorts | 1 |
| Country | USA |
| Enrollment year | 1988-1994 |
| Baseline year | 1988-1994 |
| No. Enrolled | No. of enrolled n.a |
| Total participants included (% females) | Total included 13131 (F 53,3%) |
| Mean age (range / SD) | Age 55 (n.a.) |
| Follow-up (years) | 8 years from baseline |
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| Author | Looker 2013 |

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| Design | cohort |
| Cohort name | NHANES III & NHANES 2000-2004 |
| Number of cohorts | 2 |
| Country | USA |
| Enrollment year | <i>NHANES III</i> 1988- 1994 <i>NHANES 2000-2004</i> 2000-2004 |
| Baseline year | <i>NHANES 2000-2004</i> 2000-2004 |
| No. Enrolled | <i>NHANES III</i> |
| Total participants included (% females) | No. of enrolled 8303 Total included 2946 (F 78,6%) <i>NHANES 2000-2004</i> No. of enrolled 4189 Total included 1803 (F 128,5%) |
| Mean age (range / SD) | Age 74 (n.a.) |
| Follow-up (years) | 7 years from baseline |
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| Author | Marques-Vidal 2015 |
| Design | cohort |
| Cohort name | Cohorte Lausannoise (CoLaus) study |
| Number of cohorts | 1 |
| Country | Switzerland |
| Enrollment year | 2003-2006 |
| Baseline year | 2003-2006 |
| No. Enrolled | No. of enrolled 6733 |
| Total participants included (% females) | Total included 3841 (F 57,6%) |
| Mean age (range / SD) | Age 52.2 (10.5) |
| Follow-up (years) | 5.5 years from baseline |
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| Author | Mursu 2015 |
| Design | cohort |

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|--|---|
| Cohort name | Kuopio Ischaemic Heart Disease Risk Factor Study (KIHD) |
| Number of cohorts | 1 |
| Country | Finland |
| Enrollment year | 1984-1989 |
| Baseline year | 1984-1989 |
| No. Enrolled | No. of enrolled 2682 |
| Total participants included (% females) | Total included 1892 (F 0%) |
| Mean age (range / SD) | Age (42- 60) |
| Follow-up (years) | 26 years from baseline |

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|--|---|
| Author | Olsson 2017 |
| Design | cohort |
| Cohort name | Uppsala Longitudinal Study of Adult men |
| Number of cohorts | 1 |
| Country | Sweden |
| Enrollment year | 1970 |
| Baseline year | 1991-1995 |
| No. Enrolled | No. of enrolled 2322 |
| Total participants included (% females) | Total included 1182 (F 0%) |
| Mean age (range / SD) | Age 71 (69- 74) |
| Follow-up (years) | 18 years from baseline |

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| Author | Platz 2004 |
| Design | nested case-control |
| Cohort name | Health Professionals Follow-up Study |
| Number of cohorts | 1 |
| Country | USA |
| Enrollment year | 1986 |
| Baseline year | 1993-1995 |
| No. Enrolled | No. of enrolled 51529 |

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| Total participants included (% females) | Total included 920 (F 0%) Cases 460 Controls 460 |
| Mean age (range / SD) | Age 66.5 (7.4) |
| Follow-up (years) | 5 years from baseline |
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| Author | Shimizu 2015 |
| Design | cohort |
| Cohort name | Otasha-Kenshin study |
| Number of cohorts | 1 |
| Country | Japan |
| Enrollment year | 2008 |
| Baseline year | 2008 |
| No. Enrolled | No. of enrolled 1399 |
| Total participants included (% females) | Total included 1393 (F 100%) |
| Mean age (range / SD) | Age 78.6 (75-90) |
| Follow-up (years) | 1 years from baseline |
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| Author | Swanson 2015 |
| Design | cohort |
| Cohort name | Osteoporotic Fractures in Men Study (MrOS) |
| Number of cohorts | 1 |
| Country | USA |
| Enrollment year | 2000-2002 |
| Baseline year | 2000-2002 |
| No. Enrolled | No. of enrolled 5994 |
| Total participants included (% females) | Total included 1000 (F 0%) |
| Mean age (range / SD) | Age 74.6 (6.2) |
| Follow-up (years) | 5.1 years from baseline |

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|--|---|
| Author | Umehara 2017 |
| Design | cohort |
| Cohort name | Hisayama study |
| Number of cohorts | 1 |
| Country | Japan |
| Enrollment year | 1961 |
| Baseline year | 2002-2003 |
| No. Enrolled | No. of enrolled 3328 |
| Total participants included (% females) | Total included 3292 (F 57,2%) |
| Mean age (range / SD) | Age 62 (12.5) |
| Follow-up (years) | 9.5 years from baseline |
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| Author | Vàzquez-Oliva 2018 |
| Design | case-cohort |
| Cohort name | REGICOR (Registre Gironí del COR) population cohort study |
| Number of cohorts | 1 |
| Country | Spain |
| Enrollment year | 2005 |
| Baseline year | 2005 |
| No. Enrolled | No. of enrolled 6352 |
| Total participants included (% females) | Total included 775 (F 50,2%) Cases 105 Random sub-cohort controls 667 |
| Mean age (range / SD) | Age 53.7 (10.6) |
| Follow-up (years) | 5 years from baseline |