## Online Data Supplement

Arm Based on LEg blood pressures (ABLE-BP): Can systolic ankle blood pressure measurements predict systolic arm blood pressure? An individual participant data metaanalysis from the INTERPRESS-IPD Collaboration

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| Study                                                                                        | Total<br>participants<br>N | Total<br>participants<br>included in<br>ABLE BP<br>analyses;<br>n/N (%) | Female;<br>n/N (%) | Age (years);<br>mean (SD);<br>median<br>[min, max] | Systolic arm BP<br>(mmHg); mean<br>(SD); median<br>[min, max] | Diastolic<br>arm BP<br>(mmHg);<br>mean (SD);<br>median<br>[min, max] | Current<br>smoker;<br>n/N (%) | BMI <sup>2</sup> ;<br>mean<br>(SD),<br>n; median<br>[min,<br>max] | Total<br>cholesterol<br>(mmol/l);<br>mean (SD), n | HDL cholesterol<br>(mmol/l); mean<br>(SD), n |
|----------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------|--------------------|----------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------|
| Viborg Women<br>Cohort<br>(ViWoCo) <sup>1</sup>                                              | 1440                       | 1302/1440<br>(90)                                                       | 1302/1302<br>(100) | 66.3 (5.07);<br>66 [59, 77]                        | 147.5 (20.4);<br>146 [100, 237]                               | 80.5 (9.7);<br>80<br>[47, 133]                                       | 173/1302<br>(13)              | 26.2 (5.1)<br>1276;<br>25.3 [12.9,<br>64.5]                       | 5.83 (0.96),<br>1302                              | NR                                           |
| Epidemiology of<br>dementia in<br>Central Africa<br>(EPIDEMCA) <sup>2</sup>                  | 929                        | 697/929<br>(75)                                                         | 404/697<br>(58)    | 73.1 (6.61);<br>72 [65, 99]                        | 145.3 (27.1);<br>140 [85, 240]                                | 83.3 (14.7);<br>80 [35, 140]                                         | 82/694<br>(12)                | 21.2 (4.77)<br>684;<br>20 [11, 47]                                | 4.1 (0.97), 584                                   | NR                                           |
| Heinz Nixdorf<br>Recall Study <sup>3</sup>                                                   | 4736                       | 4391/4736<br>(93)                                                       | 2234/4391<br>(51)  | 59.3 (7.75);<br>60 [45, 76]                        | 137.2 (22.0);<br>134 [82, 251]                                | NR                                                                   | 995/4386<br>(23)              | 27.9 (4.55)<br>4370;<br>27 [17. 54]                               | 5.94 (1.01),<br>4372                              | 1.51 (0.44),<br>4370                         |
| Invecchiare in<br>Chianti<br>(InCHIANTI)⁴                                                    | 1258                       | 1106/1258<br>(88)                                                       | 629/1106<br>(57)   | 66.3 (15.62);<br>70 [21, 93]                       | 145.1 (21.6);<br>145 [90, 230]                                | 83.0 (9.5);<br>80<br>[60, 120)                                       | 195/1106<br>(18)              | 27.2 (4.11)<br>1075;<br>27 [18, 44]                               | 5.57 (1.03),<br>1102                              | 1.47 (0.38),<br>1102                         |
| Lifestyle<br>Interventions<br>and<br>Independence<br>for Elders (LIFE)<br>study <sup>5</sup> | 1603                       | 1336/1603<br>(83)                                                       | 889/1336<br>(67)   | 78.1 (5.12);<br>78 [70, 89]                        | 126.7 (17.5);<br>125 [80, 197]                                | 68.4 (10.1);<br>68 [40, 106]                                         | 27/1332<br>(2)                | 30.5 (5.98)<br>1336;<br>29.7 [16.3,<br>57.6]                      | 4.61 (1), 1262                                    | 1.58 (0.46),<br>1262                         |
| Lahoz 2013<br>(Fuencarral<br>Health Center) <sup>6</sup>                                     | 1103                       | 1092/1103<br>(99)                                                       | 709/1092<br>(65)   | 69.3 (5.24);<br>69 [60, 79]                        | 141.9 (18.2);<br>140 [95, 220]                                | NR                                                                   | 107/1092<br>(10)              | 29.1 (4.35)<br>1092;<br>29 [16, 48]                               | 5.56 (0.94),<br>1084                              | 1.52 (0.37),<br>1084                         |
| Action for<br>Health in<br>Diabetes (Look<br>AHEAD) <sup>7</sup>                             | 342                        | 321/342<br>(94)                                                         | 193/321<br>(60)    | 55.8 (6.97);<br>55 [45, 74]                        | 131.9 (17.3);<br>132 [61, 196]                                | 71.5 (9.7);<br>72<br>[38, 97]                                        | 16/320<br>(5)                 | 36.4 (5.83)<br>321;<br>36 [26, 64]                                | 5.11 (0.94),<br>321                               | 1.08 (0.28), 321                             |

# Table S1 – Study level baseline demographic and health characteristics

| Improving<br>interMediAte<br>RisK<br>management<br>(MARK) study <sup>8</sup>                                                           | 2490 | 2385/2490<br>(96) | 914/2385<br>(38)  | 61.3 (7.66);<br>62 [34, 74]   | 138.1 (17.4);<br>137 [87, 234]  | 84.5 (10.1);<br>84 [55, 129]   | 665/2385<br>(28)   | 29.2 (4.41)<br>2385;<br>28.6 [18.6,<br>57.3] | 5.85 (1.06),<br>2385         | 1.29 (0.33),<br>2382 |
|----------------------------------------------------------------------------------------------------------------------------------------|------|-------------------|-------------------|-------------------------------|---------------------------------|--------------------------------|--------------------|----------------------------------------------|------------------------------|----------------------|
| Multi Ethnic<br>Study of<br>Atherosclerosis<br>(MESA) <sup>9</sup>                                                                     | 6786 | 6498/6786<br>(96) | 3425/6498<br>(53) | 61.8 (10.13);<br>62 [44, 84]  | 126.5 (20.8);<br>124 [76, 229]  | 72.2 (10.2);<br>72 [41, 120]   | 811/6478<br>(13)   | 28.3 (5.46)<br>6498;<br>28 [15, 55]          | 5.03 (0.92),<br>6475         | 1.32 (0.38),<br>6472 |
| Second<br>Manifestations<br>of ARTerial<br>disease<br>(SMART) study <sup>10</sup>                                                      | 9095 | 7177/9095<br>(79) | 2512/7177<br>(35) | 55.8 (12.5);<br>57 [18, 82]   | 140.4 (20.3);<br>138 [87, 251]  | 82.9 (11.8);<br>81 [48, 210]   | 1663/712<br>0 (23) | 27.1 (4.43)<br>7171;<br>26.5 [14.3,<br>54]   | 4.93 (1.35),<br>7139         | 1.3 (0.39), 7126     |
| Surrogate<br>markers for<br>Micro- and<br>Macrovascular<br>hard endpoints<br>as Innovative<br>diabetes tools<br>(SUMMIT) <sup>11</sup> | 375  | 314/375<br>(84)   | 108/314<br>(34)   | 66 (8.7); 66<br>[43, 86]      | 140.3 (16.0);<br>139 [105, 189] | 78.2 (8.8);<br>77<br>[55, 108] | 17/314<br>(5)      | 29.1 (5.07)<br>314;<br>28.5 [18.4,<br>48.3]  | 4.47 (1.11),<br>306          | 1.42 (0.42), 292     |
| San Diego<br>Population<br>Study <sup>12</sup>                                                                                         | 2383 | 2295/2383<br>(96) | 1516/2295<br>(66) | 58.5 (11.32);<br>58 [29, 89]  | 134.2 (20.7);<br>132 [84, 241]  | NR                             | 127/2295<br>(6)    | 27 (5.22)<br>2289;<br>26.1 [16.2,<br>53.9]   | 5.43 (1.05),<br>2224         | 1.41 (0.44),<br>2224 |
| Vietnam<br>Experience<br>Study <sup>13</sup>                                                                                           | 4460 | 4367/4460<br>(98) | 0/4367<br>(0)     | 37.8 (2.53);<br>38 [31, 48]   | 125.4 (12.2);<br>125 [85, 200]  | 85.8 (9.4);<br>85<br>[55, 136] | 1877/436<br>3 (43) | 26.8 (4.42)<br>4366;<br>26.2 [15.7,<br>66.8] | 5.49 (1.07) <i>,</i><br>4367 | 1.16 (0.32),<br>4367 |
| Chicago Walking<br>and Leg<br>Circulation<br>Study (WALCS) <sup>14</sup>                                                               | 442  | 429/442<br>(97)   | 227/429<br>(53)   | 69.9 (8.1);<br>69<br>[55, 93] | 140.8 (19.5);<br>139 [97, 206]  | NR                             | 30/429<br>(7)      | 29 (6.14)<br>426;<br>28.3 [17,<br>59.6]      | 4.63 (1), 393                | 1.25 (0.47), 393     |

Note. NR = not reported, BP = blood pressure

| Study                                                                                        | Total<br>participants;<br>N | Total participants<br>included in ABLE-<br>BP analyses; n/N<br>(%) | Hypertension;<br>n/N (%) | Diabetes<br>mellitus;<br>n/N (%) | lschaemic<br>heart<br>disease;<br>n/N (%) | Cerebrovascular<br>disease; n/N (%) | Any<br>cardiovascular<br>disease; n/N<br>(%) | Renal<br>disease;<br>n/N (%) | Atrial fibrillation<br>/ flutter; n/N (%) |
|----------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------|--------------------------|----------------------------------|-------------------------------------------|-------------------------------------|----------------------------------------------|------------------------------|-------------------------------------------|
| Viborg Women<br>Cohort<br>(ViWoCo) <sup>1</sup>                                              | 1440                        | 1302/1440 (90)                                                     | 580/1301 (45)            | 91/1300<br>(7)                   | 73/1301<br>(6)                            | 66/1301 (5)                         | 128/1301<br>(10)                             | NR                           | 47/1302 (3.6)                             |
| Epidemiology of<br>dementia in<br>Central Africa<br>(EPIDEMCA) <sup>2</sup>                  | 929                         | 697/929<br>(75)                                                    | 450/697<br>(65)          | 78/695<br>(11)                   | NR                                        | 9/693 (1)                           | 9/693<br>(1)                                 | NR                           | NR                                        |
| Heinz Nixdorf<br>Recall Study <sup>3</sup>                                                   | 4736                        | 4391/4736 (93)                                                     | 2057/4383<br>(47)        | 312/4391<br>(7)                  | 245/4384<br>(6)                           | 104/4370 (2)                        | 330/4384<br>(8)                              | NR                           | 63/4308 (1.5)                             |
| Invecchiare in<br>Chianti<br>(InCHIANTI)⁴                                                    | 1258                        | 1106/1258 (88)                                                     | 813/1096 (74)            | 122/1106<br>(11)                 | 50/1090<br>(5)                            | 44/1090 (4)                         | 90/1090<br>(8)                               | 15/208<br>(7.3)              | 26/1104 (2.4)                             |
| Lifestyle<br>Interventions<br>and<br>Independence<br>for Elders (LIFE)<br>study <sup>5</sup> | 1603                        | 1336/1603 (83)                                                     | 1092/1334<br>(82)        | 339/1330<br>(25)                 | 257/1336<br>(19)                          | 139/1332 (10)                       | 303/1336<br>(23)                             | NR                           | 31/1335 (2.3)                             |
| Lahoz 2013<br>(Fuencarral<br>Health Center) <sup>6</sup>                                     | 1103                        | 1092/1103 (99)                                                     | 532/1092 (49)            | 158/1092<br>(14)                 | 5/1092<br>(0.4)                           | 3/1092 (0)                          | 8/1092<br>(1)                                | 237/664<br>(36)              | NR                                        |
| Action for<br>Health in<br>Diabetes (Look<br>AHEAD) <sup>7</sup>                             | 342                         | 321/342<br>(94)                                                    | 261/321<br>(81)          | 321/321<br>(100)                 | 34/321<br>(11)                            | 9/320 (3)                           | 40/321<br>(12)                               | 16/321 (5)                   | NR                                        |
| Improving<br>interMediAte<br>RisK<br>management<br>(MARK) study <sup>8</sup>                 | 2490                        | 2385/2490 (96)                                                     | 2027/2385<br>(85)        | 757/2384<br>(32)                 | 0/2385<br>(0)                             | 0/2385 (0)                          | 0/2385<br>(0)                                | 124/2362<br>(5.2)            | 41/2385 (1.7)                             |

#### Table S2. Distribution of morbidities at baseline for the ABLE-BP dataset

| Multi Ethnic<br>Study of<br>Atherosclerosis                                                                                            | 6786 | 6498/6786 (96)  | 3259/6498<br>(50) | 845/6475<br>(13)   | 0/6498<br>(0)      | 0/6498 (0)     | 0/6498<br>(0)     | 137/6473<br>(2.1) | 1/6451 (0.02) |
|----------------------------------------------------------------------------------------------------------------------------------------|------|-----------------|-------------------|--------------------|--------------------|----------------|-------------------|-------------------|---------------|
| Second<br>Manifestations<br>of ARTerial<br>disease                                                                                     | 9095 | 7177/9095 (79)  | 5539/7176<br>(77) | 1254/717<br>7 (17) | 4449/657<br>9 (68) | 1412/7177 (20) | 4451/6581<br>(68) | NR                | NR            |
| Surrogate<br>markers for<br>Micro- and<br>Macrovascular<br>hard endpoints<br>as Innovative<br>diabetes tools<br>(SUMMIT) <sup>11</sup> | 375  | 314/375<br>(84) | 197/314 (63)      | 197/314<br>(63)    | 93/314<br>(30)     | 32/314 (10)    | 119/314<br>(38)   | 3/314<br>(1)      | 0/314<br>(0)  |
| San Diego<br>Population<br>Study <sup>12</sup>                                                                                         | 2383 | 2295/2383 (96)  | 760/2292 (33)     | 129/2294<br>(6)    | 125/2295<br>(5)    | 56/2295 (2)    | 166/2295<br>(7)   | NR                | NR            |
| Vietnam<br>Experience<br>Study <sup>13</sup>                                                                                           | 4460 | 4367/4460 (98)  | 2318/4367<br>(53) | 219/4367<br>(5)    | 0/4367<br>(0)      | 0/4367 (0)     | 0/4367<br>(0)     | 0/4367 (0)        | NR            |
| Chicago Walking<br>and Leg<br>Circulation                                                                                              | 442  | 429/442<br>(97) | 306/429<br>(71)   | 95/429<br>(22)     | 143/429<br>(33)    | 26/429 (6)     | 153/429<br>(36)   | NR                | NR            |

Study (WALCS)<sup>14</sup>

Note. NR = not reported. Any cardiovascular disease is defined as individuals with ischaemic heart disease and/or cerebrovascular disease. Total participants, all participants with arm and leg blood pressure readings. Total participants included in ABLE-BP cohort, which excludes those with prior diagnosis of peripheral artery disease, ankle brachial index < 0.90 and leg systolic blood pressure < 70 mmHg.

## Table S3 - Study level outcomes and attrition, all participants

| Study name                                                                                   | Total<br>participants<br>N | Number of<br>participants with<br>all-cause mortality<br>and time to death;<br>n (%) | Number of<br>participants<br>with CVS<br>cause<br>mortality<br>and time to<br>death; n (%) | Number of<br>participants<br>who had at<br>least one CVS<br>cause event<br>and time to<br>event; n (%) | Duration of follow-<br>up to death or<br>censorship (years);<br>mean (SD), n;<br>median [min, 25th<br>centile, 75th<br>centile, max] | Number of<br>participants<br>with missing<br>mortality status<br>and/or time to<br>mortality; n (%) | Number of<br>participants<br>with missing<br>CVS cause<br>mortality status<br>and/or time to<br>mortality; n (%) | Number of<br>participants with<br>missing CVS event<br>status and/or time to<br>CVS event; n (%) |
|----------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Viborg Women<br>Cohort<br>(ViWoCo) <sup>1</sup>                                              | 1440                       | 32 (2.2)                                                                             | 5 (0.3)                                                                                    | 33 (2.3)                                                                                               | 3.44 (0.53), 1440;<br>3.30 [0.41, 2.96,<br>3.95, 4.22]                                                                               | 0 (0.0)                                                                                             | 0 (0.0)                                                                                                          | 0 (0.0)                                                                                          |
| Epidemiology of<br>dementia in<br>Central Africa<br>(EPIDEMCA) <sup>2</sup>                  | 1029                       | 110 (10.7)                                                                           | 44 (4.3)                                                                                   | NR                                                                                                     | 2.01 (0.37), 946;<br>2.05 [0.11, 1.98,<br>2.09, 2.69]                                                                                | 83 (8.1)                                                                                            | 83 (8.1)                                                                                                         | NR                                                                                               |
| Heinz Nixdorf<br>Recall Study <sup>3</sup>                                                   | 4814                       | 614 (12.8)                                                                           | 169 (3.5)                                                                                  | 588 (12.2)                                                                                             | 10.68 (2.36), 4814;<br>11.48 [0.05, 10.16,<br>12.30, 14.24]                                                                          | 0 (0.0)                                                                                             | 46 (1.0)                                                                                                         | 0 (0.0)                                                                                          |
| Invecchiare in<br>Chianti<br>(InCHIANTI)⁴                                                    | 1453                       | 402 (27.7)                                                                           | 184 (12.7)                                                                                 | NR                                                                                                     | 7.97 (2.38), 1317;<br>9.11 [0.10, 7.42,<br>9.31, 11.42]                                                                              | 136 (9.4)                                                                                           | 136 (9.4)                                                                                                        | NR                                                                                               |
| Lifestyle<br>Interventions<br>and<br>Independence<br>for Elders (LIFE)<br>study <sup>5</sup> | 1635                       | 133 (8.1)                                                                            | 48 (2.9)                                                                                   | 161 (9.8)                                                                                              | 3.37 (0.87), 1635;<br>3.48 [0.00, 3.07,<br>3.98, 4.52]                                                                               | 0 (0.0)                                                                                             | 0 (0.0)                                                                                                          | 0 (0.0)                                                                                          |
| Lahoz 2013<br>(Fuencarral<br>Health Center) <sup>6</sup>                                     | 1361                       | 72 (5.3)                                                                             | 13 (1.0)                                                                                   | 61 (4.5)                                                                                               | 4.26 (0.80), 1301;<br>4.39 [0.46, 3.78,<br>4.80, 6.23]                                                                               | 60 (4.4)                                                                                            | 61 (4.5)                                                                                                         | 65 (4.8)                                                                                         |
| Action for<br>Health in<br>Diabetes (Look<br>AHEAD) <sup>7</sup>                             | 342                        | 30 (8.8)                                                                             | 8 (2.3)                                                                                    | 54 (15.8)                                                                                              | 10.36 (1.69), 342;<br>10.90 [1.18, 10.76,<br>10.94, 11.05]                                                                           | 0 (0.0)                                                                                             | 0 (0.0)                                                                                                          | 0 (0.0)                                                                                          |

| Improving<br>interMediAte<br>RisK<br>management                                                                                        | 2495   | 26 (1.0)    | 3 (0.1)   | 96 (3.8)    | 3.10 (0.34), 2471;<br>3.03 [0.07, 3.00,<br>3.14, 5.22]      | 24 (1.0)    | 24 (1.0)    | 24 (1.0) |
|----------------------------------------------------------------------------------------------------------------------------------------|--------|-------------|-----------|-------------|-------------------------------------------------------------|-------------|-------------|----------|
| Multi Ethnic<br>Study of<br>Atherosclerosis<br>(MESA) <sup>9</sup>                                                                     | 6814   | 1161 (17.0) | 278 (4.1) | 911 (13.4)  | 12.47 (2.50), 6809;<br>13.20 [0.17, 12.66,<br>13.74, 14.46] | 5 (0.1)     | 5 (0.1)     | 5 (0.1)  |
| Second<br>Manifestations<br>of ARTerial<br>disease<br>(SMART) study <sup>10</sup>                                                      | 11,139 | 1766 (15.9) | 882 (7.9) | 1888 (16.9) | 7.84 (4.67), 11,139;<br>7.60 [0.00, 3.96,<br>11.31, 18.49]  | 0 (0.0)     | 0 (0)       | 0 (0.0)  |
| Surrogate<br>markers for<br>Micro- and<br>Macrovascular<br>hard endpoints<br>as Innovative<br>diabetes tools<br>(SUMMIT) <sup>11</sup> | 596    | 14 (2.3)    | 1 (0.2)   | 35 (5.9)    | 2.93 (0.34), 596;<br>2.98 [0.57, 2.74,<br>3.14, 4.08]       | 0 (0.0)     | 0 (0.0)     | 44 (7.4) |
| San Diego<br>Population<br>Study <sup>12</sup>                                                                                         | 2404   | 473 (19.7)  | NR        | NR          | 17.58 (4.36), 2404;<br>19.21 [0.12, 18.27,<br>19.91, 20.89] | 0 (0.0)     | NR          | NR       |
| Vietnam<br>Experience<br>Study <sup>13</sup>                                                                                           | 4462   | 250 (5.6)   | 56 (1.3)  | NR          | 13.13 (2.59), 1555;<br>13.91 [0.23, 13.54,<br>14.25, 15.35] | 2907 (65.2) | 2907 (65.2) | NR       |
| Chicago Walking<br>and Leg<br>Circulation                                                                                              | 442    | 45 (10.2)   | 12 (2.7)  | NR          | 3.98 (1.10), 431;<br>4.08 [0.16, 4.00,<br>4.42, 9.74]       | 11 (2.5)    | 11 (2.5)    | NR       |

Study (WALCS)14

Note. This table presents descriptive data for all reported events, and all durations of follow-up, within the dataset, before censorship at 10-year follow-up. NR = not reported. Any cardiovascular disease (CVS) is defined as individuals with ischaemic heart disease and/or cerebrovascular disease. Total participants, all participants with arm and leg blood pressure readings, which excludes those with prior diagnosis of peripheral artery disease, ankle brachial index < 0.90 and leg systolic blood pressure < 70 mmHg.

#### Table S4 – Characteristics of included studies

| Study name                                                                     | Period of<br>patient<br>recruitment<br>/Duration of<br>trial | Sample<br>size (n<br>enrolled<br>in study) | Country<br>of origin                                    | Eligibility<br>criteria                                                                                                               | Primary<br>outcome<br>measure                                                                                                                                    | Blood pressure<br>measurement<br>methods                                                                                                                                                                             | Intended<br>maximum<br>duration<br>of follow<br>up | Definition of<br>hypertension                                                     | Definition<br>of diabetes                                                                                  | Definition of cardiovascular<br>death and non-fatal<br>cardiovascular event                                                                                                                                                          |
|--------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Viborg<br>Women<br>Cohort<br>(ViWoCo) <sup>1</sup>                             | October<br>2011-<br>January 2013                             | 1428                                       | Denmark                                                 | Females<br>born in<br>1936,<br>1941,<br>1946 and<br>1951<br>living in<br>the<br>Municipal<br>of Viborg,<br>Denmark                    | Presence of<br>cardiovascul<br>ar disease<br>and diabetes<br>mellitus                                                                                            | One pair of<br>simultaneous BP<br>readings, using<br>Omron M2 devices,<br>with patients<br>supine, rounded to<br>nearest 2mmHg.<br>Ankle pressures<br>measured<br>synchronously with<br>arms using Doppler<br>probe. | Median<br>follow-up<br>3.3 years                   | SBP ≥140<br>mmHg or DBP<br>≥90 mmHg                                               | HbA1c ≥ 48<br>mmol/mol                                                                                     | Cardiovascular death:<br>Fatal event as below<br>Non-fatal event:<br>MI or ischaemic stroke leading<br>to hospitalisation                                                                                                            |
| Epidemiology<br>of dementia<br>in Central<br>Africa<br>(EPIDEMCA) <sup>2</sup> | November<br>2011-<br>December<br>2012                        | 880                                        | Central<br>African<br>Republic/<br>Republic<br>of Congo | Males and<br>females,<br>aged ≥ 65<br>years<br>living in<br>areas of<br>Central<br>African<br>Republic<br>and<br>Republic<br>of Congo | Diagnosis of<br>dementia<br>and<br>Alzheimer's<br>disease and<br>associated<br>risk factors                                                                      | Two sequences of<br>BP measurements<br>recorded using<br>standard mercury<br>sphygmomanomet<br>er, as part of ABI<br>protocol with<br>patients supine. BP<br>rounded to nearest<br>5 mmHg                            | 2-3 years                                          | Self-reported<br>BP lowering<br>treatment;<br>SBP ≥140<br>mmHg or DBP<br>≥90 mmHg | Self-<br>reported or<br>blood<br>glucose<br>>126<br>mg/dL<br>fasting or<br>>200<br>mg/dL in<br>non-fasting | Cardiovascular death:<br>Stroke, MI or other<br>cardiovascular or<br>cerebrovascular diseases –<br>based on interview of relatives<br>during verbal autopsy at<br>follow-up.<br>Non-fatal events: Stroke, MI,<br>other heart disease |
| Heinz Nixdorf<br>Recall Study <sup>3</sup>                                     | 2000-2003                                                    | 4617                                       | Germany                                                 | Males and<br>females,<br>aged 45-<br>74 years,<br>in an<br>unselecte<br>d urban<br>populatio<br>n from<br>the Ruhr<br>area            | Coronary<br>artery<br>calcium as<br>predictor for<br>fatal and<br>non-fatal MI.<br>Secondary<br>endpoints<br>included ABI<br>as a stroke<br>predictor<br>factors | BP measured<br>sequentially using<br>Doppler probe<br>(Logidop,<br>Kranzbuhler,<br>Germany) with<br>patients supine                                                                                                  | Mean<br>follow up:<br>109<br>months                | SBP<br>>140mmHg or<br>DBP<br>>90mmHg                                              | Existing<br>diagnosis<br>or use of<br>anti-<br>diabetic<br>medication                                      | Cardiovascular death or non-<br>fatal event:<br>First occurrence of MI based on<br>symptoms, ECG signs, and<br>enzymes, supported by<br>necropsy if fatal                                                                            |

| Invecchiare in<br>Chianti<br>(InCHIANTI) <sup>4</sup>                                        | August 1998-<br>March 2000 | 1091 | Italy | Males and<br>females,<br>aged ≥ 65<br>years,<br>living in<br>Greve and<br>Bagno                                                                                   | Physiological<br>factors<br>influencing<br>walking<br>ability                                               | Single pair of<br>sequential brachial<br>BP readings using<br>standard mercury<br>sphygmomanomet<br>er, with patients<br>supine. BP rounded<br>to nearest 5 mmHg.<br>Posterior tibial<br>arteries measured<br>twice with a<br>handheld Doppler<br>stethoscope (Parks<br>model 41-A; Parks<br>Medical<br>Electronics, Inc,<br>Aloha, Ore). | N/S                                 | Self-reported,<br>existing,<br>recorded<br>diagnosis or<br>use of BP<br>lowering<br>medication or<br>SBP ≥140<br>mmHg or DBP<br>≥90 mmHg | Self-<br>reported,<br>existing<br>recorded<br>diagnosis,<br>or use of<br>anti-<br>diabetic<br>medication,<br>or fasting<br>glucose<br>>7.0<br>mmol/L | Cardiovascular death:<br>Not defined.<br><i>Non-fatal events:</i><br>Diagnosis of heart disease, MI<br>or angina, stroke or TIA                                                                                                                                                                                                                      |
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| Lifestyle<br>Interventions<br>and<br>Independence<br>for Elders<br>(LIFE) study <sup>5</sup> | 2010-2011/<br>2.6 years    | 1588 | USA   | Ambulant<br>communit<br>y dwelling<br>individual<br>s, aged<br>70-89<br>years with<br>a<br>sedentary<br>lifestyle<br>(<20min<br>per week<br>physical<br>activity) | Major<br>mobility<br>disability<br>Secondary:<br>Association<br>between ABI<br>and<br>cognitive<br>function | Two pairs of<br>sequential<br>measurements<br>recorded in each<br>arm using handheld<br>Doppler, with<br>patients supine                                                                                                                                                                                                                  | 2 years                             | Self-reported<br>or<br>measurement                                                                                                       | Self-<br>reported                                                                                                                                    | Cardiovascular fatal or<br>non-fatal events:<br>MI, angina, stroke or TIA,<br>carotid artery disease,<br>congestive heart failure or PAD<br>requiring hospitalisation,<br>outpatient revascularisation for<br>PAD, ruptured abdominal aortic<br>aneurysm                                                                                             |
| Lahoz 2013<br>(Fuencarral<br>Health<br>Center) <sup>6</sup>                                  | 2003-2004                  | 1102 | Spain | Males and<br>females,<br>aged 60-<br>79 years,<br>with no<br>known<br>PAD                                                                                         | Low ABI and<br>incidence of<br>death due to<br>cardiovascul<br>ar causes                                    | BP measured<br>sequentially with<br>Doppler 8-MHz<br>probe (Hadeco,<br>Kawasaki, Japan)<br>and calibrated<br>mercury<br>sphygmomanomet<br>er with patient<br>supine                                                                                                                                                                       | Mean<br>follow-up<br>49.8<br>months | SBP ≥140<br>mmHg, DBP<br>≥90 mmHg or<br>use of BP<br>lowering<br>treatment                                                               | Baseline<br>glucose<br>≥126 mg/dl<br>(>7<br>mmol/L) on<br>2 occasions<br>or use of<br>antidiabetic<br>agents                                         | Cardiovascular death:<br>Fatal stroke, MI, sudden death<br>without other cause, death<br>after vascular surgery or<br>procedure, death attributed to<br>heart failure, bowel or limb<br>infarction, any other death not<br>categorically attributed to a<br>non-vascular cause<br><i>Non-fatal events</i> :<br>MI, stroke or cardiovascular<br>event |

| Action for<br>Health in<br>Diabetes<br>(Look<br>AHEAD) <sup>7</sup>             | June 2001-<br>March 2004 | 339  | USA   | Overweig<br>ht and<br>obese<br>individual<br>s with<br>type 2<br>diabetes<br>aged 45-<br>76 years,<br>and had a<br>body<br>mass<br>index, 25<br>kg/m2, or<br>≥27<br>kg/m2 if<br>taking<br>insulin                                                                                                           | A composite<br>cardiovascul<br>ar outcome:<br>cardiovascul<br>ar death,<br>non-fatal MI,<br>non-fatal<br>stroke,<br>hospitalized<br>angina<br>Secondary:<br>Cognitive<br>function | Two pairs of<br>sequential BP<br>measurements<br>recorded in each<br>arm, using<br>continuous wave<br>Doppler with a<br>standard mercury<br>sphygmomanomet<br>er,<br>with patients<br>supine | 4-5 year<br>follow up | SBP ≥140<br>mmHg, ≥DBP<br>> 90 mmHg or<br>taking BP<br>lowering<br>medication                              | Self-<br>reported<br>verified<br>from<br>medical<br>records,<br>current<br>treatment,<br>or fasting<br>glucose of<br>≥126<br>mg/dL | Cardiovascular death:<br>MI, congestive heart failure,<br>death after cardiovascular<br>intervention, surgery or due to<br>arrhythmia, stroke, presumed<br>cardiovascular death, rapid<br>unexplained cardiovascular<br>death.<br><i>Non-fatal events:</i><br>Stroke, MI, angina, coronary<br>artery bypass grafting or<br>percutaneous coronary<br>intervention, congestive heart<br>failure, carotid<br>endarterectomy, peripheral<br>arterial bypass or angioplasty |
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| Improving<br>interMediAte<br>RisK<br>management<br>(MARK)<br>study <sup>8</sup> | N/S                      | 2490 | Spain | Males and<br>females<br>living in 3<br>regions of<br>Spain,<br>aged 35-<br>74 years.<br>Free of<br>atheroscle<br>rotic<br>disease,<br>with an<br>intermedi<br>ate<br>cardiovas<br>cular risk<br>(10-year<br>coronary<br>risk of 5-<br>15% or<br>vascular<br>death risk<br>of 3-5%)<br>selected<br>at random | Incidence of<br>vascular<br>events                                                                                                                                                | Three pairs of BP<br>measurements in<br>each arm, using an<br>OMRON<br>705, with patients<br>seated. Legs<br>measured with<br>Vasera device VS-<br>1500 <sup>®</sup> (Fukuda<br>Denshi)      | 10 years              | Patient<br>reported, or<br>use of BP<br>lowering<br>medications<br>or SBP<br>≥140mmHg or<br>DBP<br>≥90mmHg | Patient<br>reported,<br>or use of<br>antidiabetic<br>treatment<br>or fasting<br>glucose ≥<br>126 mg/dL                             | Cardiovascular death:<br>not defined<br>Non-fatal events:<br>Stroke or TIA, MI, angina, or<br>revascularisation procedure                                                                                                                                                                                                                                                                                                                                              |

| Multi Ethnic<br>Study of<br>Atheroscleros<br>is (MESA) <sup>9</sup>                                                                        | 2000-2002                          | 6770 | USA                    | Males and<br>females,<br>aged 45-<br>84 years,<br>free of<br>clinical<br>cardiovas<br>cular<br>diagnoses<br>at<br>baseline                                                                                                             | Association<br>of subclavian<br>stenosis with<br>markers of<br>cardiovascul<br>ar disease                                                                                                              | Single pair of<br>sequential BP<br>measurements,<br>using hand-held<br>Doppler instrument<br>and 5-mHz probe,<br>with patients<br>supine | N/S                                | Self-reported<br>history with<br>use of BP<br>lowering<br>medications,<br>or SBP<br>≥140mmHg or<br>DBP ≥<br>90mmHg   | Fasting<br>blood<br>glucose<br>≥126 mg/dl<br>or use of<br>oral<br>hypoglyce<br>mic agents<br>or insulin                                                                                                                                                                                                                 | Cardiovascular death:<br>Death due to atherosclerotic<br>coronary heart disease, stroke,<br>other cardiovascular disease.<br><i>Non-fatal</i> events:<br>Stroke, TIA, MI, angina,<br>revascularisation procedure                                                               |
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| Second<br>Manifestation<br>s of ARTerial<br>disease<br>(SMART)<br>study <sup>10</sup>                                                      | January 2002<br>– February<br>2014 | 7600 | The<br>Netherla<br>nds | Males and<br>females,<br>aged 18-<br>80 years,<br>referred<br>to<br>University<br>Medical<br>Center<br>Utrecht,<br>for<br>treatment<br>of<br>clinically<br>manifest<br>vascular<br>disease or<br>cardiovas<br>cular<br>risk<br>factors | 3 point<br>MACE<br>(combinatio<br>n of non-<br>fatal<br>myocardial<br>infarction,<br>non-fatal<br>stroke and<br>death from<br>vascular<br>disease),<br>total<br>mortality<br>and vascular<br>mortality | Single pair of<br>sequential BP<br>measurements,<br>using a Vasoguard<br>Doppler probe,<br>with patients<br>supine                       | Mean<br>follow-<br>up:5.9<br>years | Blood<br>pressure<br>>140/90<br>mmHg at<br>baseline or<br>the use of<br>blood<br>pressure<br>lowering<br>medication. | Recorded<br>and self-<br>reported<br>diagnosis,<br>use of<br>blood<br>glucose<br>lowering<br>medication,<br>or fasting<br>glucose >7<br>mmol/L at<br>recruitmen<br>t combined<br>with<br>initiation of<br>glucose<br>lowering<br>medication<br>within first<br>year of<br>follow-up.<br>Type 1<br>diabetes<br>excluded. | Cardiovascular death:<br>Death from stroke, MI,<br>congestive heart failure,<br>rupture of abdominal aortic<br>aneurysm or vascular death<br>from other causes<br><i>Non-fatal events:</i><br>Stroke (infarction or<br>haemorrhagic), MI, retinal<br>infarction, heart failure |
| Surrogate<br>markers for<br>Micro- and<br>Macrovascula<br>r hard<br>endpoints as<br>Innovative<br>diabetes tools<br>(SUMMIT) <sup>11</sup> | November<br>2010 – June<br>2013    | 334  | England                | Adults<br>over 18<br>with and<br>without<br>diabetes<br>and/or<br>cardiovas<br>cular<br>disease                                                                                                                                        |                                                                                                                                                                                                        | 6 pairs of<br>simultaneous BP<br>readings using two<br>Omron 705 devices<br>swapped after 3<br>readings, with<br>patients supine         | N/S                                | Self-reported<br>history of<br>hypertension                                                                          | HbA1c ≥ 48<br>mmol/mol                                                                                                                                                                                                                                                                                                  | <i>Cardiovascular death:</i><br>Fatal MI                                                                                                                                                                                                                                       |

| San Diego<br>Population<br>Study <sup>12</sup>                                 | 1994-1998 | 2388 | USA | Males and<br>females,<br>aged 29-<br>91 years,<br>attending<br>a clinic for<br>assessme<br>nt of PAD<br>and<br>venous<br>disease                     | Prevalence<br>of PAD                                                                              | Two pairs of BP<br>measurements,<br>using a continuous-<br>wave Doppler<br>ultrasound, with<br>patients supine                                                                                                                                         | N/S                                    | SBP ≥140<br>mmHg or DBP<br>≥ 90 mmHg or<br>use of BP<br>lowering<br>medications | Self-<br>reported or<br>use of<br>antidiabetic<br>medication<br>s                                 | Cardiovascular death:<br>not defined<br>Non-fatal events:<br>MI, stroke, angina, coronary<br>angioplasty or bypass graft, or<br>carotid endarterectomy                                     |
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| Vietnam<br>Experience<br>Study <sup>13</sup>                                   | 1986      | 4394 | USA | Male US<br>army<br>veterans<br>who<br>participat<br>ed in the<br>Vietnam<br>war                                                                      | Inter-arm<br>differences,<br>all-cause and<br>cardiovascul<br>ar mortality                        | Two pairs of<br>sequential brachial<br>and ankle<br>measurements<br>using a Model<br>1010-LA Dual<br>Frequency<br>BiDirectional<br>Doppler (Parks<br>Medical<br>Electronics,<br>Beaverton, Oregon,<br>USA) doppler probe<br>with participant<br>supine | 15 years                               | SBP ≥140<br>mmHg, DBP<br>≥90 mmHg or<br>use of BP<br>lowering<br>medication     | Fasting<br>plasma<br>glucose ≥<br>7.0 mmol/l<br>and/or use<br>of<br>medication<br>for<br>diabetes | Cardiovascular death:<br>Death due to major<br>cardiovascular disease.                                                                                                                     |
| Chicago<br>Walking and<br>Leg<br>Circulation<br>Study<br>(WALCS) <sup>14</sup> | 1998-2000 | 440  | USA | Patients<br>without<br>lower<br>extremity<br>peripheral<br>artery<br>disease<br>who were<br>recruited<br>for the<br>non-PAD<br>comparat<br>or group. | Subclavian<br>stenosis as a<br>marker for<br>total and<br>cardiovascul<br>ar disease<br>mortality | Two sequences of<br>BP readings<br>recorded using a<br>12-cm pneumatic<br>cuff and a hand<br>held Doppler probe<br>(Nicolet Vascular<br>Pocket Dop II,<br>Golden, Colo) with<br>patient supine                                                         | Mean<br>follow-up<br>was 4.8<br>years. | Patient history<br>or use of BP<br>lowering<br>therapy                          | Patient<br>history or<br>use of oral<br>antidiabetic<br>drugs<br>and/or<br>insulin                | Cardiovascular death:<br>Any fatal cardiovascular cause.<br>Non-fatal events:<br>MI, stroke, TIA, coronary or<br>peripheral revascularisation,<br>congestive heart failure, PAD,<br>angina |

BP = BP, DBP = diastolic BP, IHD = ischaemic heart disease, MI = myocardial infarction, N/S = not stated, PAD = peripheral arterial disease, SBP = systolic BP, TIA = transient ischaemic attack, ECG = electrocardiogram

# Table S5. Ankle-arm systolic blood pressure prediction model using observed and imputed data (derivation cohort)

|                                                  |                   | Lower       |                |                       |
|--------------------------------------------------|-------------------|-------------|----------------|-----------------------|
|                                                  |                   | bound       | Upper          |                       |
|                                                  |                   | of 95%      | bound of       |                       |
|                                                  | Coefficient       | CI          | 95% CI         | P value               |
| Higher-reading ankle SBP (mmHg)                  | 0.60              | 0.59        | 0.60           | <0.001                |
| Age (years)                                      | 0.19              | 0.17        | 0.20           | <0.001                |
| Female                                           | 4.30              | 3.95        | 4.64           | <0.001                |
| Smoker                                           | 2.05              | 1.69        | 2.42           | <0.001                |
| BMI (Kg/m²)                                      | 0.02              | -0.01       | 0.05           | 0.15                  |
| Total cholesterol (mmol/L)                       | 0.74              | 0.60        | 0.89           | <0.001                |
| Hypertension                                     | 6.09              | 5.75        | 6.43           | <0.001                |
| Diabetes mellitus                                | 0.56              | 0.14        | 0.98           | 0.009                 |
| Cerebrovascular disease                          | 1.47              | 0.79        | 2.16           | <0.001                |
| Ischaemic heart disease                          | -2.87             | -3.50       | -2.24          | <0.001                |
| Ethnicity                                        |                   |             |                |                       |
| - African American                               | 2.45              | 1.90        | 3.00           |                       |
| - Hispanic American                              | -0.25             | -0.92       | 0.43           | <sup>1</sup> <0.001   |
| - Other                                          | 0.04              | -0.42       | 0.49           |                       |
| Constant                                         | 23.67             | 20.69       | 26.64          | <0.001                |
| Note. <sup>1</sup> Global p-value. Confidence in | nterval, CI; Syst | tolic blood | pressure, SBP; | Body mass index, BMI. |

Table S6 – Comparison of models' classification of estimated systolic blood pressure to observed systolic blood pressure at A) 140 mmHg and B) 160 mmHg thresholds

| A<br>Observed arm<br>SBP category | ABLE-BP model<br>Estimated arm<br>SBP category |                 | Arithmetic models<br>Estimated arm SBP<br>category |                  | Totals |
|-----------------------------------|------------------------------------------------|-----------------|----------------------------------------------------|------------------|--------|
|                                   | <140<br>mmHg                                   | ≥140<br>mmHg    | <140<br>mmHg                                       | ≥140<br>mmHg     |        |
| <140 mmHg                         | 14,694                                         | 3,523           | 14,432                                             | 3,785            | 18,217 |
| ≥140 mmHg                         | 45.14%<br>3,177                                | 9.76%<br>11,157 | 44.34%<br>3,545                                    | 11.63%<br>10,789 | 14,334 |
|                                   | 10.82%                                         | 34.28%          | 10.89%                                             | 33.14%           | 32,551 |
| N misclassified                   |                                                | 6,700           |                                                    | 7,330            |        |
| % misclassified                   |                                                | 20.6%           |                                                    | 22.5%            |        |
| В                                 | ABLE-BP model                                  |                 | Arithmetic models                                  |                  | Totals |
| Observed arm                      | Estimated arm                                  |                 | Estimated arm                                      |                  |        |
| SBP category                      | SBP category                                   |                 | SBP category                                       |                  |        |
|                                   | <160                                           | ≥160            | <160                                               | ≥160             |        |
|                                   | mmHg                                           | mmHg            | mmHg                                               | mmHg             |        |
| <160 mmHg                         | 26,351                                         | 1,136           | 25,297                                             | 2,190            | 27,487 |

| ≥160 mmHg                          | 2,589 | 2,475          | 2,160 | 2,904          |
|------------------------------------|-------|----------------|-------|----------------|
|                                    | 3.49% | 7.60%          | 6.64% | 8.92%          |
| N misclassified<br>% misclassified |       | 3,725<br>11.4% |       | 4,350<br>13.4% |

80.95% 7.95%

77.71%

6.73%

5,064

32,551



Figure S1. PRISMA flow chart for literature search



### a) Derivation dataset



## b) Validation dataset

Figure S2 – Calibration plots for observed arm systolic blood pressures against model derived expected arm systolic blood pressures for a) derivation and b) validation datasets

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