

UK Biobank

Repeat Assessment: Participant Characteristics of responders vs. non-responders

Version 1.1

July 2014

<http://www.ukbiobank.ac.uk/>



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Introduction

A repeat assessment of 20,000 participants was carried out between August 2012 and June 2013 at the UK Biobank Co-ordinating Centre, Stockport, UK.

Participants who lived within an approximately 30m radius of the assessment centre were invited via email to attend and undergo a repeat assessment of all the baseline measures. This included information on their health and lifestyle, hearing and cognitive function, which was collected through a touchscreen questionnaire and a brief verbal interview. A range of physical measurements were also performed, which included: blood pressure; arterial stiffness; eye measures (visual acuity, refractometry, intraocular pressure, optical coherence tomography); body composition measures (including impedance); hand-grip strength; ultrasound bone densitometry; spirometry; and an exercise/fitness test with ECG. Samples of blood, urine and saliva were also collected.

The aim of this report is to compare the characteristics recorded at the baseline visit of participants who attended the repeat assessment visit with those who were invited but did not re-attend.

Summary of key findings of characteristics for re-attendees

Characteristics which did not differ across participants who were invited to attend the repeat assessment (whether they re-attended, declined the appointment or did not respond) include; gender, ethnic background, alcohol drinker status, and self-reporting of cancer and diabetes status at baseline.

- **Advanced Age**

Participants who attended the repeat assessment visit were more likely to be among the oldest participants recruited (28% of repeat assessment attendees were aged 60 to <65 at the baseline visit compared to 28% of participants who declined, cancelled or did not turn up to their appointment, and 22% of participants who did not respond to the invitation).

7.7% of repeat assessment attendees were aged 40 to <45 at the baseline visit compared to 7.6% of participants who declined, cancelled or did not turn up to their appointment, and 12.6% of participants who did not respond to the invitation.

- **Lower BMI**

Participants who attended the repeat assessment visit were more likely to have a lower BMI at the baseline visit compared with those who did not attend (38% of attendees had a BMI <25 kg/m² compared with 33% of participants who declined, cancelled or did not turn up to their appointment, and 29% of participants who did not respond to the invitation).

20% of participants who re-attended had BMI ≥30 kg/m² compared to 24% of participants who declined, cancelled or did not turn up to their appointment, and 27% of participants who did not respond to the invitation.

- **Less long-standing illness, disability or infirmity**

68% of participants who re-attended reported no long-standing illness, disability or infirmity compared to 64% of participants who declined, cancelled or did not turn up to their appointment, and 64% of participants who did not respond to the invitation.

- **Excellent overall health rating**

20% of participants who re-attended rated their health as 'excellent' compared to 16% of participants who declined, cancelled or did not turn up to their appointment, and 15% of participants who did not respond to the invitation.

- **Higher education**

72% of participants who re-attended were educated to degree/NVQ/HNC or other professional qualification level compared to 55% of participants who declined, cancelled or did not turn up to their appointment, and 60% of participants who did not respond to the invitation.

- **Less socio-economically deprived (Townsend score)**

62% of participants who re-attended were among the least socio-economically deprived (Townsend score <-2), compared to 56% of participants who declined, cancelled or did not turn up to their appointment, and 54% of participants who did not respond to the invitation.

Conversely, 10% of participants who re-attended were among the most deprived (Townsend score >2), compared to 13% of participants who declined, cancelled or did not turn up to their appointment, and 15% of participants who did not respond to the invitation.

- **Distance to repeat assessment centre**

Participants who re-attended lived, on average, closer to the UK Biobank Co-ordinating Centre (28% of participants who lived within 10 miles of the assessment centre re-attended compared to 11% of participants who declined, cancelled or did not turn up to their appointment, and 16% of participants who did not respond to the invitation).

22% of participants who lived over 30 miles from the assessment centre re-attended compared to 35% of participants who declined, cancelled or did not turn up to their appointment, and 34% of participants who did not respond to the invitation.

- **Never Smokers**

59% of participants who re-attended were never smokers at recruitment, compared to 54% of participants who declined, cancelled or did not turn up to their appointment, and 53% of participants who did not respond to the invitation.

Conversely, 6.3% of participants who re-attended were current smokers at baseline, compared to 9.1% of participants who declined, cancelled or did not turn up to their appointment, and 11% of participants who did not respond to the invitation.

Participant characteristics

A total of **103,514 participants** were invited to take part in the first UK Biobank repeat assessment (August 2012 – June 2013).

Age at recruitment (at the baseline visit)

- UK Biobank data-field [21003](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|---------------------------|------------------|--------------------------------------|---------------------|----------------|
| <45 years | 1,557 7.7 | 1,802 7.6 | 7,515 12.6 | 10,874 10.5 |
| 45 to <50 years | 2,176 10.7 | 2,532 10.7 | 9,377 15.8 | 14,085 13.6 |
| 50 to <55 years | 2,970 14.6 | 3,170 13.4 | 10,011 16.8 | 16,151 15.6 |
| 55 to <60 years | 4,539 22.3 | 4,418 18.7 | 10,496 17.6 | 19,453 18.8 |
| 60 to <65 years | 5,731 28.2 | 6,603 27.9 | 12,936 21.7 | 25,270 24.4 |
| 65+ years | 3,372 16.6 | 5,125 21.7 | 9,184 15.4 | 17,681 17.1 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Sex

- UK Biobank data-field [31](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|---------------|-------------------------|---|----------------------------|----------------------|
| Female | 10,405 51.1 | 13,921 58.9 | 30,341 51.0 | 54,667 52.8 |
| Male | 9,940 48.9 | 9,729 41.1 | 29,178 49.0 | 48,847 47.2 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Ethnic background

- UK Biobank data-field [21000](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------------------|-------------------------|---|----------------------------|----------------------|
| White | 19,852 97.6 | 23,085 97.6 | 56,698 95.3 | 99,635 96.3 |
| Other | 443 2.2 | 491 2.1 | 2,585 4.3 | 3,519 3.4 |
| Don't know | 2 0.01 | 6 0.03 | 14 0.02 | 22 0.02 |
| Prefer not to answer | 44 0.2 | 46 0.2 | 168 0.3 | 258 0.3 |
| Missing | 4 0.02 | 22 0.09 | 54 0.09 | 80 0.08 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Body Mass Index (BMI)

- UK Biobank data-field [21001](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------|------------------|--------------------------------------|---------------------|----------------|
| <25 | 7,629 37.5 | 7,862 33.2 | 17,198 28.9 | 32,689 31.6 |
| 25 to 30 | 8,590 42.2 | 10,007 42.3 | 26,090 43.8 | 44,687 43.2 |
| 30+ | 4,080 20.1 | 5,669 24.0 | 15,883 26.7 | 25,632 24.8 |
| Missing | 46 0.2 | 112 0.5 | 348 0.6 | 506 0.5 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Qualifications

- UK Biobank data-field [6138](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|---|------------------|--------------------------------------|---------------------|----------------|
| Degree/NVQ, HDN, HNC/Other prof. | 14,748 72.5 | 13,068 55.3 | 35,642 59.9 | 63,458 61.3 |
| A-level or equiv. | 1,060 5.2 | 1,218 5.2 | 2,977 5.0 | 5,255 5.1 |
| GCSE/CSE or equiv. | 2,648 13.0 | 4,500 19.0 | 10,632 17.9 | 17,780 17.2 |
| None of the above | 1,800 8.9 | 4,615 19.5 | 9,638 16.2 | 16,053 15.5 |
| Prefer not to answer | 85 0.4 | 228 1.0 | 581 1.0 | 894 0.9 |
| Missing | 4 0.02 | 21 0.09 | 49 0.08 | 74 0.07 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Townsend deprivation index

- UK Biobank data-field [189](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|------------------------------|------------------|--------------------------------------|---------------------|----------------|
| Least deprived <-2 | 12,544 61.7 | 13,433 56.8 | 32,257 54.2 | 58,234 56.3 |
| -2 to 2 | 5,707 28.1 | 7,218 30.5 | 18,110 30.4 | 31,035 30.0 |
| Most deprived 2+ | 2,083 10.2 | 2,977 12.6 | 9,084 15.3 | 14,144 13.7 |
| Missing | 11 0.05 | 22 0.09 | 68 0.1 | 101 0.1 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Home area population density - urban or rural

- UK Biobank data-field [20118](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|----------------|------------------|--------------------------------------|---------------------|----------------|
| Urban | 17,418 85.6 | 21,030 88.9 | 52,944 89.0 | 91,392 88.3 |
| Rural | 2,778 13.7 | 2,492 10.5 | 6,056 10.2 | 11,326 10.9 |
| Missing | 149 0.7 | 128 0.5 | 519 0.9 | 796 0.8 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Distance from home residence (at recruitment*) to repeat assessment centre

* A small number of participants would have changed address in the time between recruitment and the repeat assessment.

- Based on UK Biobank data-fields [20074](#) and [20075](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|---------------------------|-------------------------|---|----------------------------|----------------------|
| <10 miles | 5,670 27.9 | 2,675 11.3 | 9,533 16.0 | 17,878 17.3 |
| 10 to <20 miles | 5,180 25.5 | 5,208 22.0 | 11,177 18.8 | 21,565 20.8 |
| 20 to <30 miles | 4,938 24.3 | 7,309 30.9 | 17,929 30.1 | 30,176 29.2 |
| 30+ miles | 4,411 21.7 | 8,332 35.2 | 20,372 34.2 | 33,115 32.0 |
| Missing | 146 0.7 | 126 0.5 | 508 0.9 | 780 0.8 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Smoking status

- UK Biobank data-field [20116](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------------------|------------------|--------------------------------------|---------------------|----------------|
| Never | 11,971 58.8 | 12,876 54.4 | 31,612 53.1 | 56,459 54.5 |
| Previous | 7,042 34.6 | 8,520 36.0 | 20,868 35.1 | 36,430 35.2 |
| Current | 1,283 6.3 | 2,153 9.1 | 6,786 11.4 | 10,222 9.9 |
| Prefer not to answer | 45 0.2 | 86 0.4 | 206 0.4 | 337 0.3 |
| Missing | 4 0.02 | 15 0.06 | 47 0.08 | 66 0.06 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Alcohol drinker status

- UK Biobank data-field [20117](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------------------|------------------|--------------------------------------|---------------------|----------------|
| Never | 617 3.0 | 813 3.4 | 2,280 3.8 | 3,710 3.6 |
| Previous | 521 2.6 | 788 3.3 | 1,964 3.3 | 3,273 3.2 |
| Current | 19,197 94.4 | 22,017 93.1 | 55,171 92.7 | 96,385 93.1 |
| Prefer not to answer | 6 0.0 | 17 0.1 | 56 0.1 | 79 0.1 |
| Missing | 4 0.0 | 15 0.1 | 48 0.1 | 67 0.1 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Cancer diagnosed by doctor

- UK Biobank data-field [2453](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------------------|------------------|--------------------------------------|---------------------|----------------|
| No | 18,903 92.9 | 21,690 91.7 | 55,129 92.6 | 95,722 92.5 |
| Yes | 1,384 6.8 | 1,884 8.0 | 4,135 7.0 | 7,403 7.2 |
| Do not know | 47 0.2 | 48 0.2 | 173 0.3 | 268 0.3 |
| Prefer not to answer | 7 0.03 | 5 0.02 | 25 0.04 | 37 0.04 |
| Missing | 4 0.02 | 23 0.1 | 57 0.1 | 84 0.08 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Diabetes diagnosed by a doctor

- UK Biobank data-field [2443](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------------------|------------------|--------------------------------------|---------------------|----------------|
| No | 19,491 95.8 | 22,396 94.7 | 56,145 94.3 | 98,032 94.7 |
| Yes | 826 4.1 | 1,185 5.0 | 3,149 5.3 | 5,160 5.0 |
| Do not know | 22 0.1 | 42 0.2 | 150 0.3 | 214 0.2 |
| Prefer not to answer | 2 0.01 | 4 0.02 | 18 0.03 | 24 0.02 |
| Missing | 4 0.02 | 23 0.1 | 57 0.1 | 84 0.08 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Long-standing illness, disability or infirmity

- UK Biobank data-field [2188](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------------------|-------------------------|---|----------------------------|----------------------|
| No | 13,873 68.2 | 15,229 64.4 | 38,632 64.9 | 67,734 65.4 |
| Yes | 6,085 29.9 | 7,831 33.1 | 19,326 32.5 | 33,242 32.1 |
| Do not know | 370 1.8 | 525 2.2 | 1,412 2.4 | 2,307 2.2 |
| Prefer not to answer | 13 0.06 | 42 0.2 | 94 0.2 | 149 0.1 |
| Missing | 4 0.02 | 23 0.1 | 55 0.09 | 82 0.08 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Overall health rating

- UK Biobank data-field [2178](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|-----------------------------|------------------|--------------------------------------|---------------------|----------------|
| Excellent | 4,239 20.8 | 3,698 15.6 | 8,611 14.5 | 16,548 16.0 |
| Good | 12,267 60.3 | 13,986 59.1 | 34,456 57.9 | 60,709 58.7 |
| Fair | 3,266 16.1 | 4,849 20.5 | 13,122 22.1 | 21,237 20.5 |
| Poor | 523 2.6 | 1,004 4.3 | 2,997 5.0 | 4,524 4.4 |
| Do not know | 42 0.2 | 84 0.4 | 255 0.4 | 381 0.4 |
| Prefer not to answer | 4 0.02 | 6 0.03 | 23 0.04 | 33 0.03 |
| Missing | 4 0.02 | 23 0.1 | 55 0.09 | 82 0.08 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |

Episode(s) in hospital

- UK Biobank data-field [41083](#)

| | Attended n, % | Declined, cancelled, no show n, % | No response n, % | Total n, % |
|--------------|------------------|--------------------------------------|---------------------|----------------|
| Yes | 11,113 54.6 | 13,623 57.6 | 34,620 58.2 | 59,356 57.3 |
| No | 9,232 45.4 | 10,027 42.4 | 24,899 41.8 | 44,158 42.7 |
| Total | 20,345 | 23,650 | 59,519 | 103,514 |