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Chapter 16: Investigating the Use of Nurse Paradata in Understanding Nonresponse to Biological Data Collection.

Appendix 16

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Chapter 16: Investigating the Use of Nurse Paradata in Understanding Nonresponse to Biological
Data Collection

Appendix 16

Fiona Pashazadeh, Alexandru Cernat, and Joseph W. Sakshaug

Full book reference:

Olson, K., J. D. Smyth, J. Dykema, A. L. Holbrook, F. Kreuter, B. T. West. 2020. *Interviewer Effects from a Total Survey Error Perspective*. Boca Raton: CRC Press.

Appendix 16A: Descriptive statistics for available call records

Figure A16A.1 Histograms of wave 2 nurse visit call length by call status with outlier of 691 minutes removed from the 'any interviewing done' category

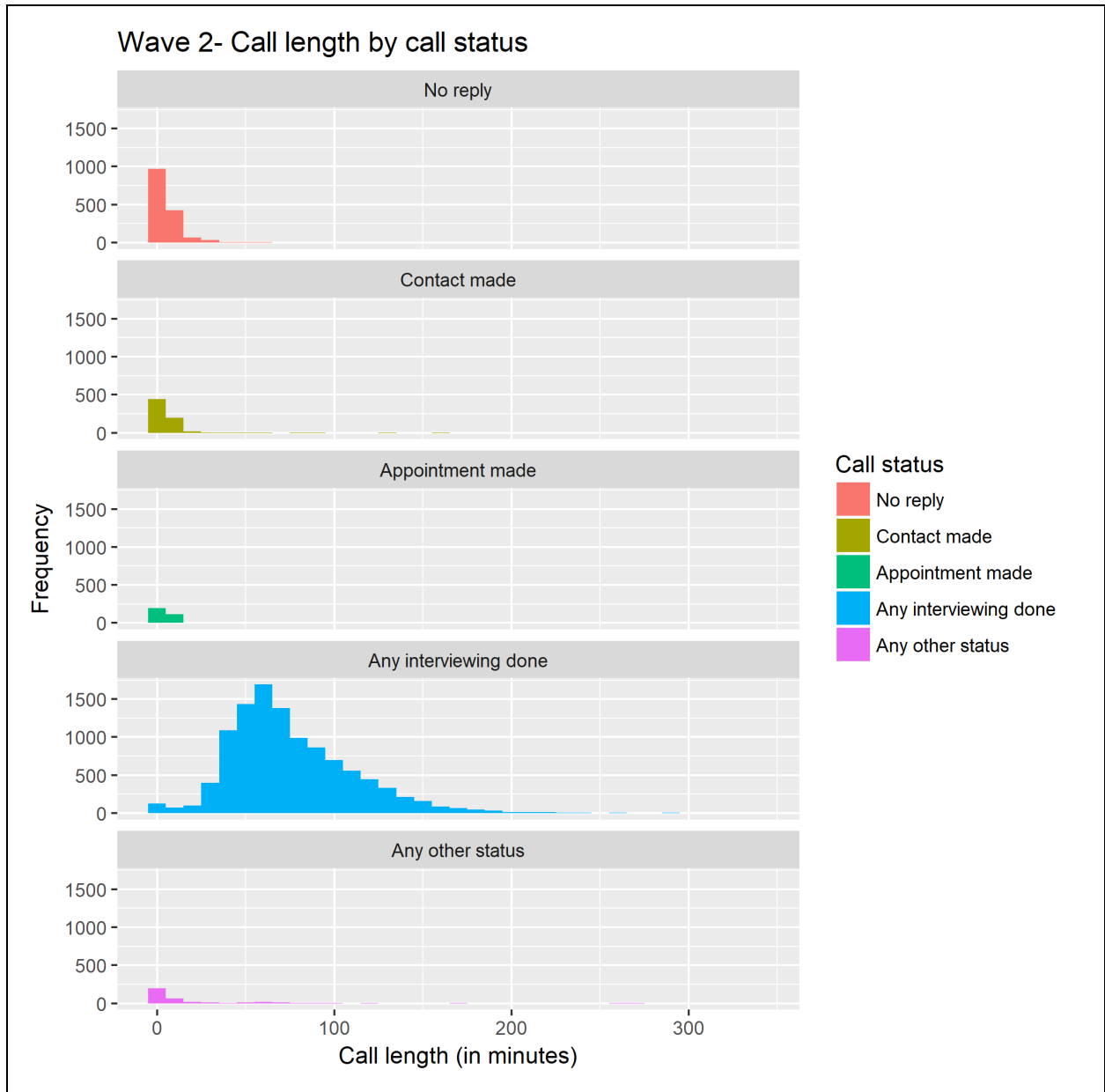


Figure A16A.2 Histograms of wave 3 nurse visit call length by call status with outlier of 464 minutes removed from the 'any interviewing done' category

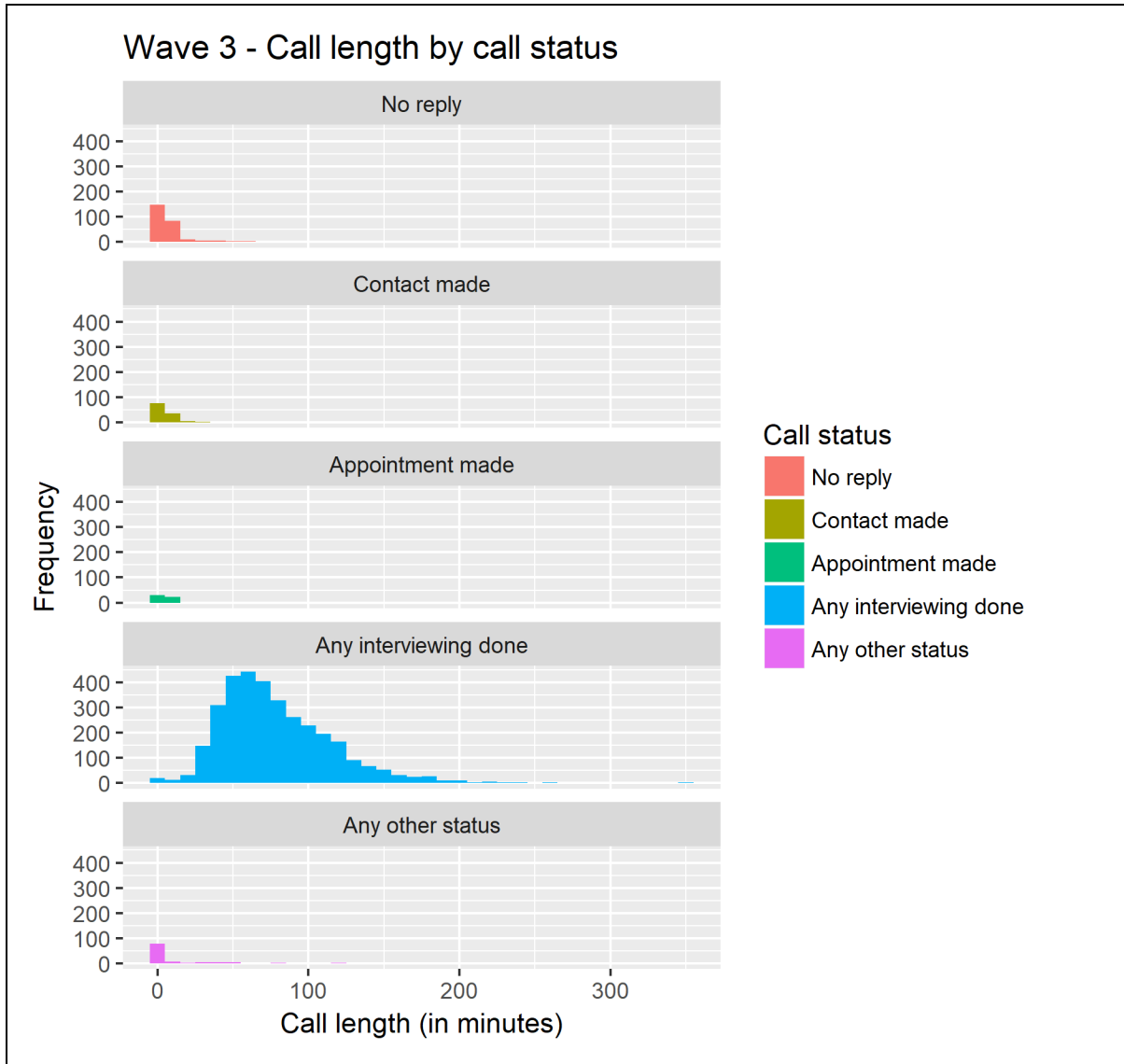


Figure A16A.3 Bar chart of total number of calls per household at UKHLS wave 2 nurse visit

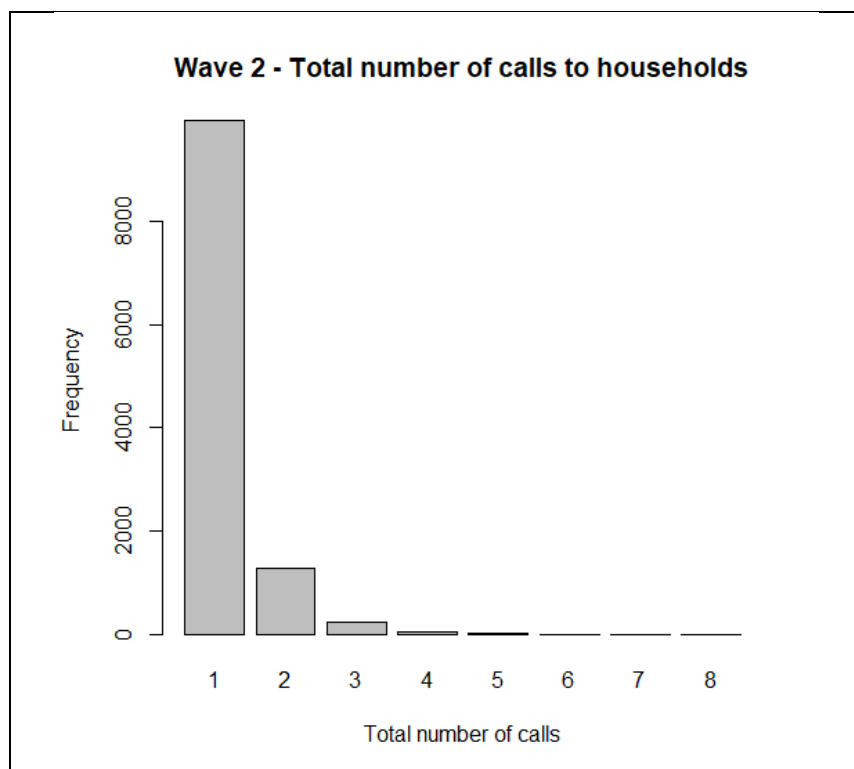


Figure A16A.4 Bar chart of total number of calls per household at UKHLS wave 3 nurse visit

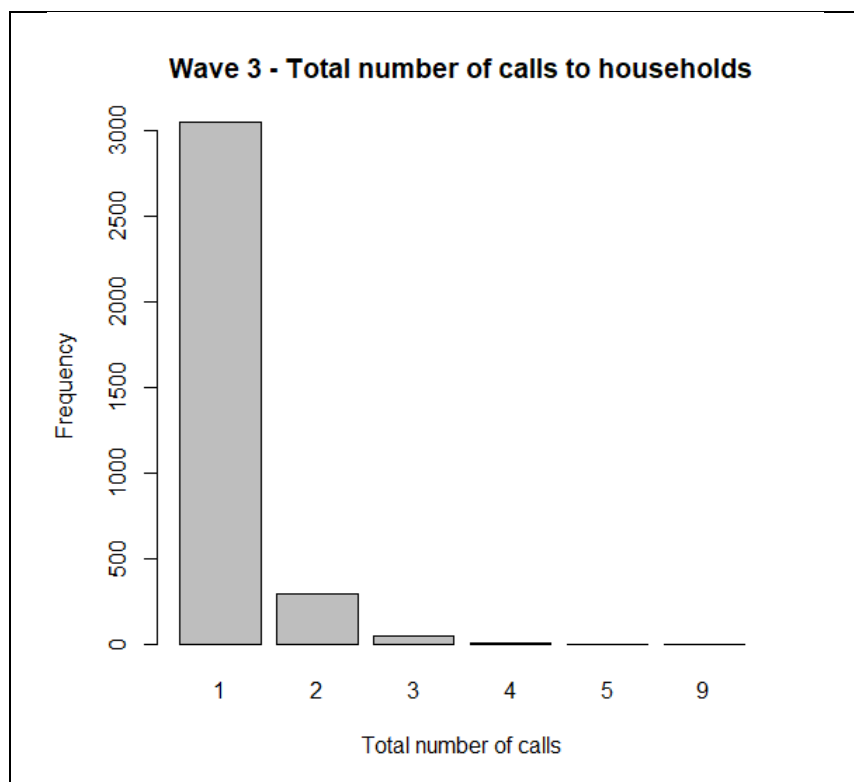


Figure A16A.5 Histogram of total nurse visit time in minutes – wave 2

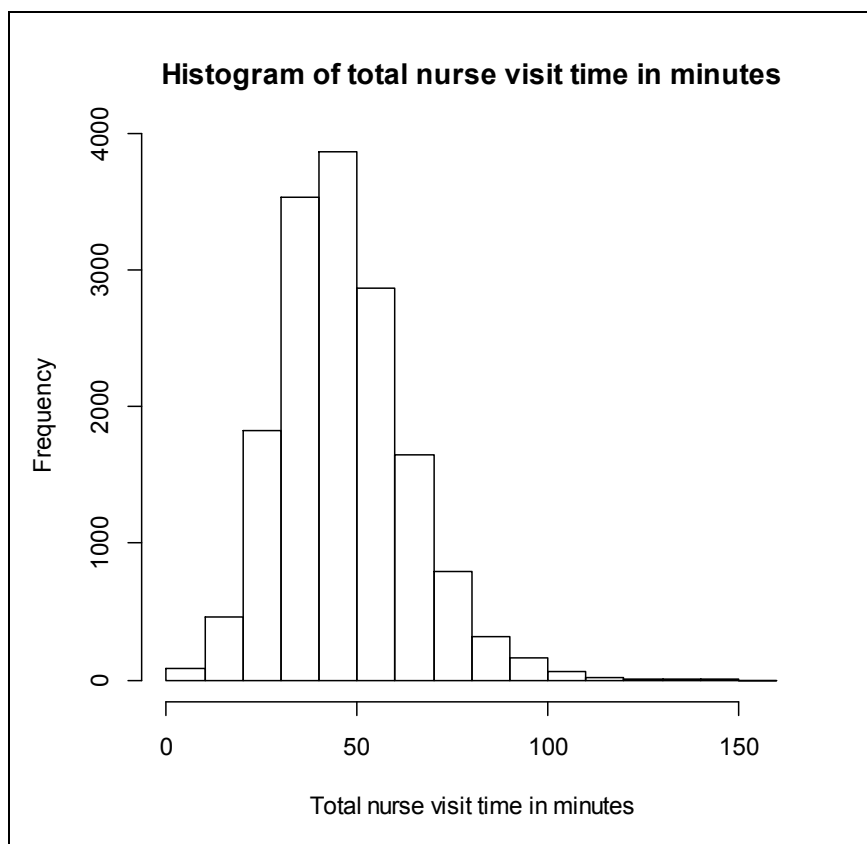
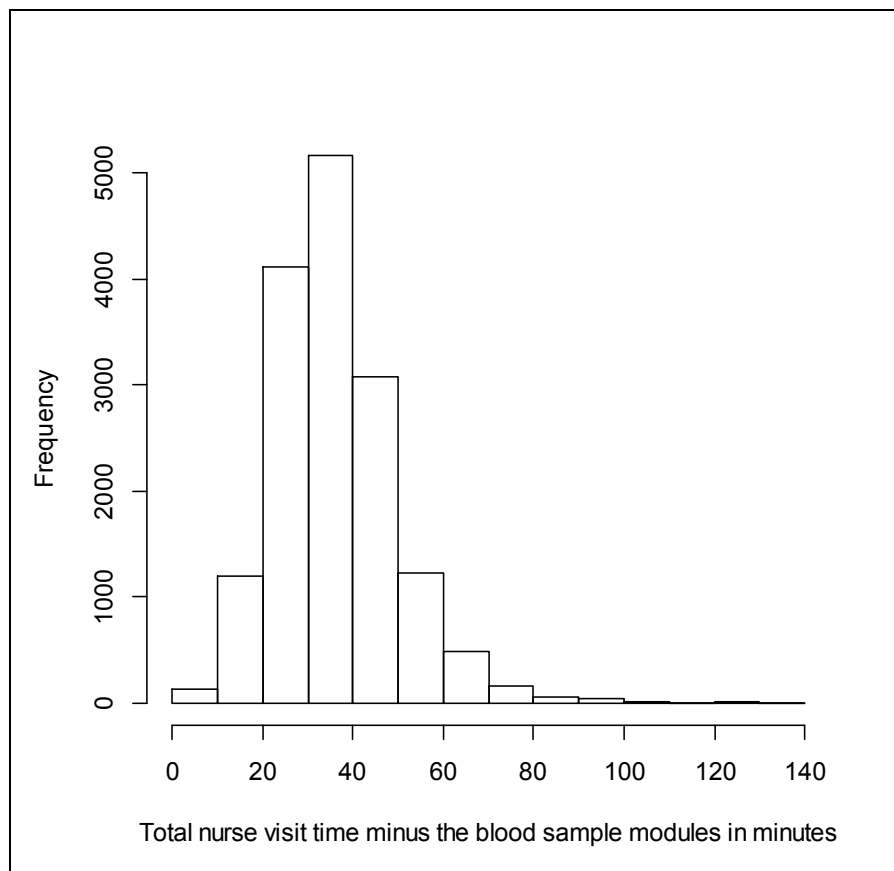


Figure A16A.6 Histogram of total nurse visit time in minutes minus the blood sample modules – wave 2



Appendix 16B: Full Results from Regression Models Corresponding to Tables 16.4-16.12 in Main Body

Table A16B.1 Results from cross-classified multilevel logistic regression models for the log-odds of participating in the wave 2 nurse visit using nurse characteristics and paradata variables. Corresponds to table 16.4 in main body.

	Model 1	Model 2	Model 3
Intercept	1.10*** (0.12)	1.09*** (0.11)	-0.99*** (0.18)
Sex	0.05 (0.04)	0.05 (0.04)	0.15** (0.06)
Age/100	2.49*** (0.21)	2.50*** (0.21)	2.84*** (0.32)
Marital status (ref=single)			
Married/civil partner	0.25*** (0.07)	0.25*** (0.07)	0.49*** (0.10)
Separated/divorced/widowed	0.11 (0.07)	0.11 (0.07)	0.32** (0.12)
Living as a couple	0.18* (0.08)	0.18* (0.08)	0.43*** (0.11)
Employment (ref=employed)			
Self-employed	-0.06 (0.07)	-0.06 (0.07)	-0.01 (0.11)
Unemployed	0.02 (0.08)	0.02 (0.08)	-0.04 (0.12)
Retired	0.05 (0.07)	0.06 (0.07)	-0.01 (0.11)
Looking after family/home	0.11 (0.08)	0.11 (0.08)	0.18 (0.12)
Student	0.17 (0.09)	0.17* (0.09)	0.01 (0.12)
Long-term sick/disabled	0.25* (0.11)	0.26* (0.11)	0.34 (0.18)
Other job status	0.17 (0.16)	0.16 (0.16)	0.48 (0.26)
Qualifications (ref=none)			
GCSE etc	0.33*** (0.07)	0.34*** (0.07)	0.40*** (0.10)
A-level etc	0.32*** (0.07)	0.32*** (0.07)	0.29** (0.11)
Degree	0.48*** (0.07)	0.48*** (0.07)	0.35** (0.11)

Other higher degree	0.38*** (0.07)	0.38*** (0.07)	0.37** (0.12)
Other qual	0.26*** (0.07)	0.26*** (0.07)	0.13 (0.11)
Race (non-white)	-0.23*** (0.07)	-0.23*** (0.07)	-0.17 (0.10)
Number of adults in household (ref=1)			
2 adults	-0.29*** (0.07)	-0.29*** (0.07)	-1.03*** (0.11)
3+ adults	-0.44*** (0.07)	-0.44*** (0.07)	-1.46*** (0.11)
Children	-0.01 (0.05)	-0.01 (0.05)	-0.03 (0.07)
Housing tenure (ref=owned outright)			
Mortgage	-0.04 (0.05)	-0.04 (0.05)	0.22** (0.08)
Social housing	-0.32*** (0.06)	-0.31*** (0.06)	0.02 (0.10)
Rented private unfurnished	-0.28*** (0.08)	-0.27*** (0.08)	0.19 (0.12)
Rented private furnished	-0.23* (0.10)	-0.23* (0.10)	0.37* (0.16)
Other housing	-0.50** (0.17)	-0.51** (0.17)	0.19 (0.28)
London	-0.19 (0.11)	-0.23* (0.11)	-0.03 (0.14)
Rural	-0.03 (0.06)	-0.03 (0.06)	-0.11 (0.08)
Long-standing illness	0.17*** (0.05)	0.17*** (0.05)	0.11 (0.07)
Self-rated health (ref=excellent)			
Very good health	0.13* (0.05)	0.13* (0.05)	0.19* (0.08)
Good health	-0.01 (0.06)	-0.01 (0.06)	0.16 (0.08)
Fair health	0.08 (0.07)	0.08 (0.07)	0.23* (0.11)
Poor health	-0.16 (0.10)	-0.15 (0.10)	0.19 (0.15)
Number of calls for main interview (ref=1-2)			
3-6 calls	-0.08 (0.04)	-0.07 (0.04)	-0.02 (0.06)

7+ calls	-0.40*** (0.06)	-0.40*** (0.06)	-0.08 (0.09)
Interviewer observations (main survey)			
Uncooperative	-0.67*** (0.11)	-0.67*** (0.11)	-0.64*** (0.16)
Suspicious	-0.69*** (0.10)	-0.69*** (0.10)	-0.62*** (0.15)
Nurse characteristics			
Nurse age		2.00*** (0.52)	1.35* (0.59)
Nurse experience		1.14 (0.95)	-0.53 (1.06)
Outcome of first call (ref=no reply)			
Contact made			0.02 (0.13)
Appointment made			2.48*** (0.19)
Any interviewing done			3.90*** (0.10)
Any other status			0.01 (0.16)
Missing contact info			-3.65*** (0.19)
Main interview length			-0.03 (0.03)
AIC	21747.81	21730.87	10839.49
BIC	22065.41	22064.35	11220.61
Log Likelihood	-10833.91	-10823.43	-5371.75
Num. obs.	20743	20743	20743
Num. groups: b_psu.x	2219	2219	2219
Num. groups: b_nsintnum	155	155	155
Area-level variance	0.46	0.46	0.43
Nurse-level variance	0.22	0.17	0.17

*** p < 0.001, ** p < 0.01, * p < 0.05

Table A16B.2 Results from cross-classified logistic regression models of the log-odds of consenting to the blood sample in the wave 2 nurse visit using nurse characteristics and paradata variables. Corresponds to table 16.5 in main body.

	Model 1	Model 2	Model 3
Intercept	1.41*** (0.14)	1.41*** (0.14)	0.92*** (0.21)
Sex	0.01 (0.05)	0.01 (0.05)	0.01 (0.05)
Age/100	2.37*** (0.26)	2.36*** (0.26)	2.23*** (0.26)
Marital status (ref=single)			
Married/civil partner	0.09 (0.09)	0.09 (0.09)	0.10 (0.09)
Separated/divorced/widowed	0.06 (0.09)	0.05 (0.09)	0.04 (0.09)
Living as a couple	0.05 (0.10)	0.05 (0.10)	0.07 (0.10)
Employment (ref=employed)			
Self-employed	-0.14 (0.09)	-0.14 (0.09)	-0.14 (0.09)
Unemployed	-0.12 (0.11)	-0.12 (0.11)	-0.11 (0.11)
Retired	-0.13 (0.08)	-0.13 (0.08)	-0.13 (0.08)
Looking after family/home	-0.26** (0.09)	-0.26** (0.09)	-0.26** (0.09)
Student	-0.29* (0.12)	-0.29* (0.12)	-0.30** (0.12)
Long-term sick/disabled	0.08 (0.14)	0.08 (0.14)	0.08 (0.14)
Other job status	-0.35 (0.19)	-0.36 (0.19)	-0.37* (0.19)
Qualifications (ref=none)			
GCSE etc	0.13 (0.08)	0.13 (0.08)	0.11 (0.08)
A-level etc	0.18* (0.08)	0.18* (0.08)	0.17* (0.09)
Degree	0.11 (0.08)	0.11 (0.08)	0.09 (0.08)
Other higher degree	0.26** (0.09)	0.26** (0.09)	0.25** (0.09)
Other qual	0.14	0.14	0.13

	(0.09)	(0.09)	(0.09)
Race (non-white)	-0.58***	-0.58***	-0.59***
	(0.09)	(0.09)	(0.09)
Number of adults in household (ref=1)			
2 adults	-0.04	-0.04	-0.02
	(0.09)	(0.09)	(0.09)
3+ adults	0.08	0.08	0.10
	(0.09)	(0.09)	(0.09)
Children	-0.02	-0.02	-0.02
	(0.06)	(0.06)	(0.06)
Housing tenure (ref=owned outright)			
Mortgage	0.06	0.05	0.06
	(0.06)	(0.06)	(0.06)
Social housing	-0.08	-0.08	-0.06
	(0.08)	(0.08)	(0.08)
Rented private unfurnished	-0.04	-0.04	-0.04
	(0.10)	(0.10)	(0.10)
Rented private furnished	-0.16	-0.16	-0.16
	(0.13)	(0.13)	(0.13)
Other housing	0.16	0.16	0.16
	(0.25)	(0.25)	(0.25)
London	0.00	0.01	-0.01
	(0.12)	(0.12)	(0.12)
Rural	-0.04	-0.04	-0.05
	(0.06)	(0.06)	(0.06)
Long-standing illness	0.13*	0.13*	0.12*
	(0.06)	(0.06)	(0.06)
Self-rated health (ref=excellent)			
Very good health	-0.07	-0.07	-0.07
	(0.07)	(0.07)	(0.07)
Good health	-0.14	-0.14	-0.14
	(0.07)	(0.07)	(0.07)
Fair health	-0.09	-0.09	-0.10
	(0.09)	(0.09)	(0.09)
Poor health	-0.38**	-0.38**	-0.40**
	(0.12)	(0.12)	(0.12)
Number of calls for main interview (ref=1-2)			
3-6 calls	-0.07	-0.07	-0.07
	(0.05)	(0.05)	(0.05)
7+ calls	-0.07	-0.07	-0.06
	(0.08)	(0.08)	(0.08)
Interviewer observations (main survey)			

Uncooperative	0.04 (0.17)	0.04 (0.17)	0.04 (0.17)
Suspicious	-0.70*** (0.13)	-0.70*** (0.13)	-0.70*** (0.14)
Nurse performance			
Nurse age		0.40 (0.59)	0.15 (0.60)
Nurse experience		-1.07 (1.06)	-0.22 (1.09)
Outcome of first call (ref=no reply)			
Contact made			-0.38 (0.22)
Appointment made			-0.10 (0.22)
Any interviewing done			0.16 (0.14)
Any other status			0.20 (0.31)
Missing contact info			1.65* (0.65)
Main interview length			0.06* (0.03)
Non-blood visit length			0.91*** (0.22)
<hr/>			
AIC	14086.66	14089.55	14062.46
BIC	14388.41	14406.39	14432.10
Log Likelihood	-7003.33	-7002.77	-6982.23
Num. obs.	13958	13958	13958
Num. groups: b_psu.x	2081	2081	2081
Num. groups: b_nsintnum	155	155	155
Area-level variance	0.19	0.19	0.20
Nurse-level variance	0.24	0.23	0.24

*** p < 0.001, ** p < 0.01, * p < 0.05

Table A16B.3 Results from cross-classified logistic regression models of the log-odds of obtaining the blood sample in the wave 2 nurse visit using nurse characteristics and paradata variables. Corresponds to table 16.6 in main body.

	Model 1	Model 2	Model 3
Intercept	2.78*** (0.21)	2.78*** (0.21)	2.43*** (0.32)
Sex (female)	-0.35*** (0.07)	-0.35*** (0.07)	-0.35*** (0.07)
Age/100	-0.45 (0.39)	-0.44 (0.39)	-0.51 (0.39)
Marital status (ref=single)			
Married/civil partner	0.34* (0.14)	0.34* (0.14)	0.34* (0.14)
Separated/divorced/widowed	0.07 (0.13)	0.07 (0.13)	0.06 (0.13)
Living as a couple	0.23 (0.16)	0.23 (0.16)	0.22 (0.16)
Employment (ref=employed)			
Self-employed	0.09 (0.15)	0.09 (0.15)	0.08 (0.15)
Unemployed	-0.25 (0.16)	-0.25 (0.16)	-0.25 (0.16)
Retired	-0.07 (0.12)	-0.07 (0.12)	-0.07 (0.12)
Looking after family/home	0.19 (0.16)	0.19 (0.16)	0.19 (0.16)
Student	-0.21 (0.21)	-0.21 (0.21)	-0.23 (0.21)
Long-term sick/disabled	-0.23 (0.18)	-0.23 (0.18)	-0.24 (0.18)
Other job status	-0.34 (0.29)	-0.34 (0.29)	-0.35 (0.29)
Qualifications (ref=none)			
GCSE etc	-0.01 (0.12)	-0.01 (0.12)	-0.00 (0.12)
A-level etc	0.01 (0.12)	0.01 (0.12)	0.01 (0.12)
Degree	-0.02 (0.12)	-0.01 (0.12)	-0.02 (0.12)
Other higher degree	0.15 (0.13)	0.15 (0.13)	0.14 (0.13)
Other qual	-0.09	-0.09	-0.09

	(0.12)	(0.12)	(0.12)
Race (non-white)	-0.47***	-0.47***	-0.46**
	(0.14)	(0.14)	(0.14)
Number of adults in household (ref=1)			
2 adults	-0.26*	-0.27*	-0.25*
	(0.13)	(0.13)	(0.13)
3+ adults	-0.28*	-0.28*	-0.27*
	(0.13)	(0.13)	(0.13)
Children	-0.09	-0.09	-0.09
	(0.09)	(0.09)	(0.09)
Housing tenure (ref=owned outright)			
Mortgage	0.03	0.03	0.03
	(0.10)	(0.10)	(0.10)
Social housing	-0.09	-0.09	-0.08
	(0.11)	(0.11)	(0.11)
Rented private unfurnished	0.00	0.01	0.01
	(0.15)	(0.15)	(0.15)
Rented private furnished	0.16	0.16	0.17
	(0.23)	(0.23)	(0.23)
Other housing	0.14	0.14	0.14
	(0.38)	(0.38)	(0.38)
London	-0.16	-0.17	-0.18
	(0.16)	(0.16)	(0.16)
Rural	-0.05	-0.05	-0.07
	(0.09)	(0.09)	(0.09)
Long-standing illness	-0.11	-0.11	-0.12
	(0.08)	(0.08)	(0.08)
Self-rated health (ref=excellent)			
Very good health	0.13	0.13	0.13
	(0.11)	(0.11)	(0.11)
Good health	-0.09	-0.09	-0.09
	(0.11)	(0.11)	(0.11)
Fair health	-0.14	-0.14	-0.15
	(0.13)	(0.13)	(0.13)
Poor health	-0.63***	-0.63***	-0.65***
	(0.16)	(0.16)	(0.17)
Number of calls for main interview (ref=1-2)			
3-6 calls	-0.02	-0.02	-0.01
	(0.07)	(0.07)	(0.07)
7+ calls	0.01	0.02	0.03
	(0.13)	(0.13)	(0.13)
Interviewer observations (main survey)			

Uncooperative	-0.63**	-0.63**	-0.62**
	(0.21)	(0.21)	(0.21)
Suspicious	0.08	0.08	0.07
	(0.24)	(0.24)	(0.24)
Nurse characteristics			
Nurse age		0.71	0.62
		(0.85)	(0.86)
Nurse experience		2.17	2.64
		(1.56)	(1.58)
Outcome of first call (ref=no reply)			
Contact made			-0.10
			(0.36)
Appointment made			-0.01
			(0.35)
Any interviewing done			0.20
			(0.22)
Any other status			0.35
			(0.45)
Missing contact info			-0.35
			(0.54)
Main interview length			-0.11**
			(0.03)
Non-blood visit length			0.58
			(0.31)
<hr/>			
AIC	6784.10	6784.17	6783.34
BIC	7075.68	7090.32	7140.52
Log Likelihood	-3352.05	-3350.09	-3342.67
Num. obs.	10822	10822	10822
Num. groups: b_psu.x	2045	2045	2045
Num. groups: b_nsintnum	154	154	154
Area-level variance	0.04	0.04	0.04
Nurse-level variance	0.51	0.49	0.49

*** p < 0.001, ** p < 0.01, * p < 0.05

Table A16.4 Results from cross-classified logistic regression models of the log-odds of participating in the wave 3 nurse visit using nurse characteristics and paradata variables. Corresponds to table 16.7 in main body.

	Model 1	Model 2	Model 3
Intercept	1.42*** (0.22)	1.38*** (0.22)	-0.31 (0.37)
Sex	0.09 (0.07)	0.09 (0.07)	0.24* (0.10)
Age/100	2.16*** (0.39)	2.16*** (0.39)	3.36*** (0.60)
Marital status (ref=single)			
Married/civil partner	0.41** (0.14)	0.41** (0.14)	0.55** (0.20)
Separated/divorced/widowed	0.28 (0.15)	0.28 (0.15)	0.47 (0.25)
Living as a couple	0.29* (0.14)	0.30* (0.14)	0.50* (0.20)
Employment (ref=employed)			
Self-employed	-0.37** (0.12)	-0.37** (0.12)	-0.48** (0.18)
Unemployed	-0.01 (0.16)	-0.01 (0.16)	-0.05 (0.23)
Retired	0.04 (0.14)	0.05 (0.14)	-0.46* (0.22)
Looking after family/home	-0.06 (0.16)	-0.05 (0.16)	-0.03 (0.25)
Student	0.30* (0.15)	0.31* (0.15)	0.41* (0.20)
Long-term sick/disabled	0.28 (0.21)	0.29 (0.21)	0.75* (0.38)
Other job status	-0.17 (0.26)	-0.17 (0.26)	-0.09 (0.39)
Qualifications (ref=none)			
GCSE etc	0.43*** (0.13)	0.43*** (0.13)	0.53** (0.19)
A-level etc	0.26* (0.13)	0.27* (0.13)	0.39* (0.19)
Degree	0.32* (0.14)	0.32* (0.14)	0.45* (0.21)
Other higher degree	0.46** (0.15)	0.47** (0.15)	0.71** (0.24)
Other qual	0.20	0.21	0.27

	(0.15)	(0.15)	(0.23)
Race (non-white)	-0.00	-0.00	-0.01
	(0.18)	(0.18)	(0.26)
Number of adults in household (ref=1)			
2 adults	-0.27	-0.27	-0.96***
	(0.14)	(0.14)	(0.23)
3+ adults	-0.56***	-0.56***	-1.46***
	(0.14)	(0.14)	(0.22)
Children	-0.11	-0.12	-0.03
	(0.08)	(0.08)	(0.12)
Housing tenure (ref=owned outright)			
Mortgage	-0.00	-0.00	-0.10
	(0.10)	(0.10)	(0.14)
Social housing	-0.35**	-0.35**	-0.01
	(0.12)	(0.12)	(0.19)
Rented private unfurnished	0.02	0.02	0.26
	(0.16)	(0.16)	(0.23)
Rented private furnished	0.13	0.13	0.19
	(0.22)	(0.22)	(0.31)
Other housing	-0.41	-0.42	-0.16
	(0.28)	(0.28)	(0.43)
London	-0.16	-0.15	0.19
	(0.23)	(0.22)	(0.29)
Rural	-0.02	-0.03	0.02
	(0.09)	(0.09)	(0.12)
Long-standing illness	0.14	0.15	0.07
	(0.08)	(0.09)	(0.13)
Self-rated health (ref=excellent)			
Very good health	-0.13	-0.12	-0.14
	(0.10)	(0.10)	(0.15)
Good health	-0.09	-0.09	-0.01
	(0.11)	(0.11)	(0.16)
Fair health	-0.20	-0.21	-0.16
	(0.13)	(0.13)	(0.20)
Poor health	-0.32	-0.32	-0.13
	(0.19)	(0.19)	(0.29)
Number of calls for main interview (ref=1-2)			
3-6 calls	-0.26***	-0.25***	-0.08
	(0.07)	(0.07)	(0.11)
7+ calls	-0.34*	-0.34*	-0.21
	(0.14)	(0.14)	(0.20)
Interviewer observations (main survey)			

Uncooperative	-0.30 (0.24)	-0.29 (0.24)	0.46 (0.40)
Suspicious	-0.46 (0.23)	-0.45 (0.23)	-0.35 (0.34)
Nurse characteristics			
Nurse age		2.72** (0.92)	-0.01 (1.02)
Nurse experience		0.32 (1.57)	1.30 (1.73)
Outcome of first call (ref=no reply)			
Contact made			0.09 (0.28)
Appointment made			2.28*** (0.42)
Any interviewing done			3.38*** (0.20)
Any other status			-0.19 (0.29)
Missing contact info			-4.92*** (0.49)
Main interview length			0.01 (0.07)
<hr/>			
AIC	6321.36	6315.34	3257.60
BIC	6591.86	6599.36	3582.20
Log Likelihood	-3120.68	-3115.67	-1580.80
Num. obs.	6390	6390	6390
Num. groups: c_psu.x	397	397	397
Num. groups: c_nsintnum	129	129	129
Area-level variance	0.28	0.29	0.17
Nurse-level variance	0.45	0.40	0.32

*** p < 0.001, ** p < 0.01, * p < 0.05

Table A16B.5 Results from cross-classified logistic regression models of the log-odds of consenting to the blood sample in the wave 3 nurse visit using nurse characteristics and paradata variables. Corresponds to table 16.8 in main body.

	Model 1	Model 2	Model 3
Intercept	1.42*** (0.25)	1.39*** (0.25)	1.24** (0.41)
Sex (female)	-0.01 (0.08)	-0.01 (0.08)	-0.01 (0.08)
Age/100	2.54*** (0.44)	2.55*** (0.44)	2.53*** (0.45)
Married/civil partner	0.05 (0.16)	0.05 (0.16)	0.05 (0.16)
Separated/divorced/widowed	0.22 (0.17)	0.21 (0.17)	0.22 (0.17)
Living as a couple	-0.10 (0.16)	-0.11 (0.16)	-0.11 (0.16)
Self-employed	-0.23 (0.15)	-0.23 (0.15)	-0.23 (0.15)
Unemployed	-0.23 (0.19)	-0.23 (0.19)	-0.24 (0.20)
Retired	-0.14 (0.15)	-0.14 (0.15)	-0.15 (0.15)
Looking after family/home	0.01 (0.19)	0.01 (0.19)	0.01 (0.19)
Student	-0.22 (0.19)	-0.21 (0.19)	-0.22 (0.19)
Long-term sick/disabled	-0.31 (0.24)	-0.31 (0.24)	-0.31 (0.24)
Other job status	-0.52 (0.30)	-0.53 (0.30)	-0.53 (0.30)
GCSE etc	0.06 (0.15)	0.06 (0.15)	0.06 (0.15)
A-level etc	0.13 (0.15)	0.13 (0.15)	0.13 (0.15)
Degree	0.19 (0.16)	0.19 (0.16)	0.20 (0.16)
Other higher degree	0.04 (0.17)	0.04 (0.17)	0.04 (0.17)
Other qual	-0.20 (0.17)	-0.20 (0.17)	-0.20 (0.17)
Race (non-white)	-0.64** (0.20)	-0.64** (0.20)	-0.64** (0.20)

2 adults	0.02 (0.16)	0.02 (0.16)	0.02 (0.16)
3+ adults	-0.03 (0.16)	-0.03 (0.16)	-0.02 (0.16)
Children	0.16 (0.10)	0.15 (0.10)	0.15 (0.10)
Mortgage	-0.14 (0.11)	-0.14 (0.11)	-0.14 (0.11)
Social housing	-0.33* (0.14)	-0.33* (0.14)	-0.33* (0.14)
Rented private unfurnished	-0.37* (0.17)	-0.36* (0.17)	-0.36* (0.17)
Rented private furnished	-0.13 (0.24)	-0.13 (0.24)	-0.13 (0.24)
Other housing	-0.73* (0.32)	-0.73* (0.32)	-0.74* (0.32)
London	0.31 (0.24)	0.31 (0.24)	0.31 (0.24)
Rural	-0.08 (0.09)	-0.08 (0.09)	-0.08 (0.09)
Long-standing illness	0.02 (0.10)	0.02 (0.10)	0.01 (0.10)
Very good health	-0.02 (0.11)	-0.02 (0.11)	-0.02 (0.11)
Good health	0.04 (0.12)	0.04 (0.12)	0.05 (0.12)
Fair health	-0.05 (0.15)	-0.05 (0.15)	-0.05 (0.15)
Poor health	0.03 (0.22)	0.03 (0.22)	0.03 (0.22)
3-6 calls	0.10 (0.08)	0.10 (0.08)	0.11 (0.08)
7+ calls	0.07 (0.17)	0.08 (0.17)	0.08 (0.17)
Uncooperative	-0.02 (0.30)	-0.02 (0.30)	-0.01 (0.30)
Suspicious	-0.54* (0.26)	-0.54* (0.26)	-0.54* (0.26)
Nurse age		1.23 (0.92)	1.19 (0.93)
Nurse experience		0.74 (1.58)	0.79 (1.61)

Contact made	0.14 (0.46)
Appointment made	0.17 (0.48)
Any interviewing done	0.11 (0.29)
Any other status	0.03 (0.48)
Missing contact info	0.42 (1.20)
Main interview length	0.04 (0.06)
Non-blood visit length	0.03 (0.41)

AIC	4774.83	4776.06	4789.16
BIC	5033.10	5047.24	5105.54
Log Likelihood	-2347.41	-2346.03	-2345.58
Num. obs.	4707	4707	4707
Num. groups: c_psu.x	396	396	396
Num. groups: c_nsintnum	128	128	128
Area-level variance	0.10	0.10	0.10
Nurse-level variance	0.36	0.35	0.35

*** p < 0.001, ** p < 0.01, * p < 0.05

Table A16B.6 Results from cross-classified multilevel logistic regression models of the log-odds of obtaining the blood sample in the wave 3 nurse visit using nurse characteristics and paradata variables. Corresponds to table 16.9 in main body.

	Model 1	Model 2	Model 3
Intercept	2.33*** (0.35)	2.32*** (0.35)	2.48*** (0.63)
Sex (female)	-0.40** (0.12)	-0.40** (0.12)	-0.40** (0.12)
Age/100	-0.93 (0.66)	-0.93 (0.66)	-0.92 (0.67)
Marital status (ref=single)			
Married/civil partner	0.83*** (0.23)	0.83*** (0.23)	0.81*** (0.23)
Separated/divorced/widowed	0.88*** (0.24)	0.88*** (0.24)	0.88*** (0.24)
Living as a couple	0.70** (0.26)	0.69** (0.26)	0.70** (0.26)
Employment (ref=employed)			
Self-employed	0.57 (0.30)	0.58 (0.30)	0.58 (0.30)
Unemployed	0.71 (0.43)	0.70 (0.43)	0.73 (0.43)
Retired	0.11 (0.22)	0.11 (0.22)	0.12 (0.22)
Looking after family/home	-0.26 (0.28)	-0.26 (0.28)	-0.26 (0.28)
Student	-0.32 (0.30)	-0.32 (0.30)	-0.33 (0.30)
Long-term sick/disabled	0.53 (0.35)	0.54 (0.35)	0.57 (0.35)
Other job status	-0.92* (0.44)	-0.93* (0.45)	-0.93* (0.45)
Qualifications (ref=none)			
GCSE etc	0.04 (0.21)	0.04 (0.21)	0.03 (0.21)
A-level etc	0.00 (0.21)	0.00 (0.21)	0.00 (0.21)
Degree	0.17 (0.24)	0.18 (0.24)	0.18 (0.24)

Other higher degree	-0.12 (0.24)	-0.12 (0.24)	-0.12 (0.24)
Other qual	-0.40 (0.23)	-0.39 (0.23)	-0.38 (0.23)
Race (non-white)	-0.19 (0.33)	-0.18 (0.33)	-0.16 (0.34)
Number of adults in household (ref=1)			
2 adults	-0.19 (0.23)	-0.18 (0.23)	-0.18 (0.23)
3+ adults	-0.18 (0.23)	-0.17 (0.23)	-0.17 (0.23)
Children	0.07 (0.16)	0.07 (0.16)	0.07 (0.16)
Housing tenure (ref=owned outright)			
Mortgage	0.05 (0.17)	0.05 (0.17)	0.05 (0.17)
Social housing	-0.18 (0.20)	-0.18 (0.20)	-0.20 (0.20)
Rented private unfurnished	-0.12 (0.28)	-0.12 (0.28)	-0.12 (0.28)
Rented private furnished	-0.67* (0.32)	-0.66* (0.32)	-0.68* (0.32)
Other housing	-0.10 (0.58)	-0.09 (0.58)	-0.08 (0.58)
London	-0.30 (0.29)	-0.32 (0.29)	-0.29 (0.29)
Rural	-0.04 (0.14)	-0.04 (0.14)	-0.05 (0.14)
Long-standing illness	0.20 (0.15)	0.19 (0.15)	0.20 (0.15)
Self-rated health (ref=excellent)			
Very good health	-0.18 (0.19)	-0.18 (0.19)	-0.18 (0.19)
Good health	-0.06 (0.20)	-0.06 (0.20)	-0.06 (0.20)
Fair health	-0.39 (0.24)	-0.38 (0.24)	-0.37 (0.24)
Poor health	-1.42*** (0.28)	-1.43*** (0.29)	-1.42*** (0.29)
Number of calls for main interview (ref=1-2)			
3-6 calls	-0.16 (0.12)	-0.15 (0.12)	-0.16 (0.12)

7+ calls	0.19 (0.29)	0.20 (0.29)	0.19 (0.29)
Interviewer observations (main survey)			
Uncooperative	0.14 (0.45)	0.14 (0.45)	0.13 (0.45)
Suspicious	-0.06 (0.47)	-0.06 (0.47)	-0.05 (0.47)
Nurse characteristics			
Nurse age		-0.59 (1.11)	-0.41 (1.13)
Nurse experience		2.76 (1.94)	2.42 (1.98)
Outcome of first call (ref=no reply)			
Contact made			-0.49 (0.69)
Appointment made			-0.30 (0.71)
Any interviewing done			0.03 (0.48)
Any other status			0.18 (0.80)
Missing contact info			12.71 (181.08)
Main interview length			-0.03 (0.07)
Non-blood visit length			-0.48 (0.60)
<hr/>			
AIC	2394.38	2396.26	2407.24
BIC	2642.34	2656.63	2711.00
Log Likelihood	-1157.19	-1156.13	-1154.62
Num. obs.	3638	3638	3638
Num. groups: c_psu.x	395	395	395
Num. groups: c_nsintnum	127	127	127
Area-level variance	0.12	0.15	0.14
Nurse-level variance	0.30	0.31	0.31

*** p < 0.001, ** p < 0.01, * p < 0.05

Table A16B.7 Results from cross-classified logistic regression models of the log-odds of participating in the wave 3 nurse visit using nurse performance indicators. Corresponds to table 16.10 in main body.

	Model 1	Model 2
Intercept	1.42*** (0.22)	1.50*** (0.22)
Sex (female)	0.09 (0.07)	0.09 (0.07)
Age/100	2.16*** (0.39)	2.14*** (0.39)
Marital status (ref=single)		
Married/civil partner	0.41** (0.14)	0.41** (0.14)
Separated/divorced/widowed	0.28 (0.15)	0.29 (0.15)
Living as a couple	0.29* (0.14)	0.30* (0.14)
Employment (ref=employed)		
Self-employed	-0.37** (0.12)	-0.36** (0.12)
Unemployed	-0.01 (0.16)	-0.01 (0.16)
Retired	0.04 (0.14)	0.04 (0.14)
Looking after family/home	-0.06 (0.16)	-0.06 (0.16)
Student	0.30* (0.15)	0.30 (0.15)
Long-term sick/disabled	0.28 (0.21)	0.30 (0.21)
Other job status	-0.17 (0.26)	-0.14 (0.26)
Qualifications (ref=none)		
GCSE etc	0.43*** (0.13)	0.42*** (0.13)
A-level etc	0.26* (0.13)	0.26* (0.13)
Degree	0.32* (0.14)	0.32* (0.14)
Other higher degree	0.46** (0.15)	0.48** (0.15)
Other qual	0.20	0.20

	(0.15)	(0.15)
Race (non-white)	-0.00	0.01
	(0.18)	(0.18)
Number of adults in household (ref=1)		
2 adults	-0.27	-0.27
	(0.14)	(0.14)
3+ adults	-0.56***	-0.57***
	(0.14)	(0.14)
Children	-0.11	-0.12
	(0.08)	(0.08)
Housing tenure (ref=owned outright)		
Mortgage	-0.00	-0.00
	(0.10)	(0.10)
Social housing	-0.35**	-0.35**
	(0.12)	(0.12)
Rented private unfurnished	0.02	0.02
	(0.16)	(0.16)
Rented private furnished	0.13	0.14
	(0.22)	(0.22)
Other housing	-0.41	-0.44
	(0.28)	(0.28)
London	-0.16	-0.00
	(0.23)	(0.21)
Rural	-0.02	-0.03
	(0.09)	(0.09)
Long-standing illness	0.14	0.14
	(0.08)	(0.08)
Self-rated health (ref=excellent)		
Very good health	-0.13	-0.13
	(0.10)	(0.10)
Good health	-0.09	-0.09
	(0.11)	(0.11)
Fair health	-0.20	-0.21
	(0.13)	(0.13)
Poor health	-0.32	-0.33
	(0.19)	(0.19)
Number of calls for main interview (ref=1-2)		
3-6 calls	-0.26***	-0.25***
	(0.07)	(0.07)
7+ calls	-0.34*	-0.35*
	(0.14)	(0.14)
Interviewer observations (main survey)		

Uncooperative	-0.30 (0.24)	-0.29 (0.24)
Suspicious	-0.46 (0.23)	-0.47* (0.23)
Nurse performance		
‘Above-average interviewer’		0.63** (0.22)
‘Below-average interviewer’		-0.71*** (0.16)
<hr/>		
AIC	6321.36	6296.10
BIC	6591.86	6580.13
Log Likelihood	-3120.68	-3106.05
Num. obs.	6390	6390
Num. groups: c_psu.x	397	397
Num. groups: c_nsintnum	129	129
Area-level variance	0.28	0.28
Nurse-level variance	0.45	0.28

***p < 0.001, **p < 0.01, *p < 0.05

Table A16B.8 Results from cross-classified logistic regression models of the log-odds of consenting to the blood sample in the wave 3 nurse visit using nurse performance indicators. Corresponds to table 16.11 in main body.

	Model 1	Model 2
Intercept	1.42***	1.49***
	(0.25)	(0.25)
Sex (female)	-0.01	-0.01
	(0.08)	(0.08)
Age/100	2.54***	2.55***
	(0.44)	(0.44)
Marital status (ref=single)		
Married/civil partner	0.05	0.05
	(0.16)	(0.16)
Separated/divorced/widowed	0.22	0.22
	(0.17)	(0.17)
Living as a couple	-0.10	-0.11
	(0.16)	(0.16)
Employment (ref=employed)		
Self-employed	-0.23	-0.23
	(0.15)	(0.15)
Unemployed	-0.23	-0.23
	(0.19)	(0.19)
Retired	-0.14	-0.14
	(0.15)	(0.15)
Looking after family/home	0.01	0.00
	(0.19)	(0.19)
Student	-0.22	-0.21
	(0.19)	(0.19)
Long-term sick/disabled	-0.31	-0.31
	(0.24)	(0.24)
Other job status	-0.52	-0.51
	(0.30)	(0.30)
Qualifications (ref=none)		
GCSE etc	0.06	0.06
	(0.15)	(0.15)
A-level etc	0.13	0.13
	(0.15)	(0.15)
Degree	0.19	0.19
	(0.16)	(0.16)
Other higher degree	0.04	0.04
	(0.17)	(0.17)
Other qual	-0.20	-0.20

	(0.17)	(0.17)
Race (non-white)	-0.64**	-0.64**
	(0.20)	(0.20)
Number of adults in household (ref=1)		
2 adults	0.02	0.02
	(0.16)	(0.16)
3+ adults	-0.03	-0.03
	(0.16)	(0.16)
Children	0.16	0.16
	(0.10)	(0.10)
Housing tenure (ref=owned outright)		
Mortgage	-0.14	-0.14
	(0.11)	(0.11)
Social housing	-0.33*	-0.33*
	(0.14)	(0.14)
Rented private unfurnished	-0.37*	-0.37*
	(0.17)	(0.17)
Rented private furnished	-0.13	-0.13
	(0.24)	(0.24)
Other housing	-0.73*	-0.73*
	(0.32)	(0.32)
London	0.31	0.32
	(0.24)	(0.24)
Rural	-0.08	-0.08
	(0.09)	(0.09)
Long-standing illness	0.02	0.02
	(0.10)	(0.10)
Self-rated health (ref=excellent)		
Very good health	-0.02	-0.02
	(0.11)	(0.11)
Good health	0.04	0.04
	(0.12)	(0.12)
Fair health	-0.05	-0.05
	(0.15)	(0.15)
Poor health	0.03	0.03
	(0.22)	(0.22)
Number of calls for main interview (ref=1-2)		
3-6 calls	0.10	0.10
	(0.08)	(0.08)
7+ calls	0.07	0.07
	(0.17)	(0.17)
Interviewer observations (main survey)		

Uncooperative	-0.02 (0.30)	-0.01 (0.30)
Suspicious	-0.54* (0.26)	-0.55* (0.26)
Nurse performance		
‘Above-average interviewer’		-0.22 (0.23)
‘Below-average interviewer’		-0.22 (0.18)
<hr/>		
AIC	4774.83	4776.80
BIC	5033.10	5047.99
Log Likelihood	-2347.41	-2346.40
Num. obs.	4707	4707
Num. groups: c_psu.x	396	396
Num. groups: c_nsintnum	128	128
Area-level variance	0.10	0.10
Nurse-level variance	0.36	0.35

***p < 0.001, **p < 0.01, *p < 0.05

Table A16B.9 Results from cross-classified logistic regression models of the log-odds of obtaining the blood sample in the wave 3 nurse visit using nurse performance indicators. Corresponds to table 16.12 in main body.

	Model 1	Model 2
Intercept	2.33*** (0.35)	2.39*** (0.36)
Sex (female)	-0.40** (0.12)	-0.40** (0.12)
Age/100	-0.93 (0.66)	-0.93 (0.66)
Marital status (ref=single)		
Married/civil partner	0.83*** (0.23)	0.83*** (0.23)
Separated/divorced/widowed	0.88*** (0.24)	0.88*** (0.24)
Living as a couple	0.70** (0.26)	0.70** (0.26)
Employment (ref=employed)		
Self-employed	0.57 (0.30)	0.58 (0.30)
Unemployed	0.71 (0.43)	0.71 (0.43)
Retired	0.11 (0.22)	0.11 (0.22)
Looking after family/home	-0.26 (0.28)	-0.27 (0.28)
Student	-0.32 (0.30)	-0.31 (0.30)
Long-term sick/disabled	0.53 (0.35)	0.53 (0.35)
Other job status	-0.92* (0.44)	-0.90* (0.45)
Qualifications (ref=none)		
GCSE etc	0.04 (0.21)	0.04 (0.21)
A-level etc	0.00 (0.21)	0.00 (0.21)
Degree	0.17 (0.24)	0.18 (0.23)
Other higher degree	-0.12 (0.24)	-0.12 (0.24)
Other qual	-0.40	-0.39

	(0.23)	(0.23)
Race (non-white)	-0.19	-0.19
	(0.33)	(0.33)
Number of adults in household (ref=1)		
2 adults	-0.19	-0.18
	(0.23)	(0.23)
3+ adults	-0.18	-0.18
	(0.23)	(0.23)
Children	0.07	0.07
	(0.16)	(0.16)
Housing tenure (ref=owned outright)		
Mortgage	0.05	0.05
	(0.17)	(0.17)
Social housing	-0.18	-0.18
	(0.20)	(0.20)
Rented private unfurnished	-0.12	-0.12
	(0.28)	(0.28)
Rented private furnished	-0.67*	-0.68*
	(0.32)	(0.32)
Other housing	-0.10	-0.11
	(0.58)	(0.58)
London	-0.30	-0.30
	(0.29)	(0.29)
Rural	-0.04	-0.04
	(0.14)	(0.14)
Long-standing illness	0.20	0.20
	(0.15)	(0.15)
Self-rated health (ref=excellent)		
Very good health	-0.18	-0.18
	(0.19)	(0.19)
Good health	-0.06	-0.06
	(0.20)	(0.20)
Fair health	-0.39	-0.39
	(0.24)	(0.24)
Poor health	-1.42***	-1.41***
	(0.28)	(0.29)
Number of calls for main interview (ref=1-2)		
3-6 calls	-0.16	-0.16
	(0.12)	(0.12)
7+ calls	0.19	0.19
	(0.29)	(0.29)
Interviewer observations (main survey)		

Uncooperative	0.14	0.14
	(0.45)	(0.45)
Suspicious	-0.06	-0.05
	(0.47)	(0.46)
Nurse performance		
‘Above-average interviewer’		-0.27
		(0.26)
‘Below-average interviewer’		-0.18
		(0.22)
<hr/>		
AIC	2394.38	2396.87
BIC	2642.34	2657.23
Log Likelihood	-1157.19	-1156.43
Num. obs.	3638	3638
Num. groups: c_psu.x	395	395
Num. groups: c_nsintnum	127	127
Area-level variance	0.12	0.13
Nurse-level variance	0.30	0.31

***p < 0.001, **p < 0.01, *p < 0.05

Appendix 16C: Quantile-Quantile plot of nurse residuals for the model of having call records in wave 2

Figure A16C.1 Quantile-Quantile plot of nurse residuals with 95% confidence intervals from the model of having call records in wave 2. The green oval indicates the nurses with above-average call recording and the red oval indicates the nurses with below-average call recording.

