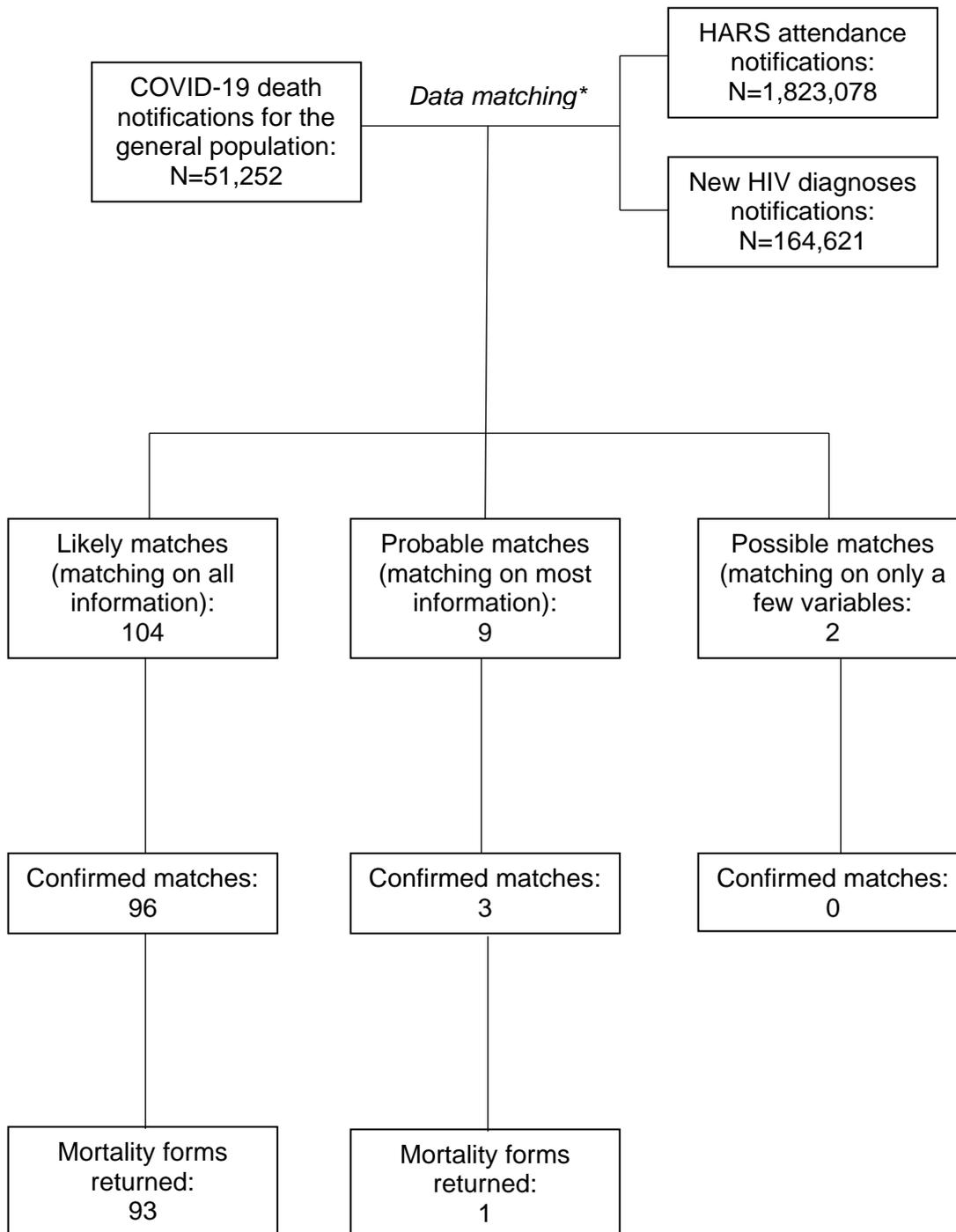


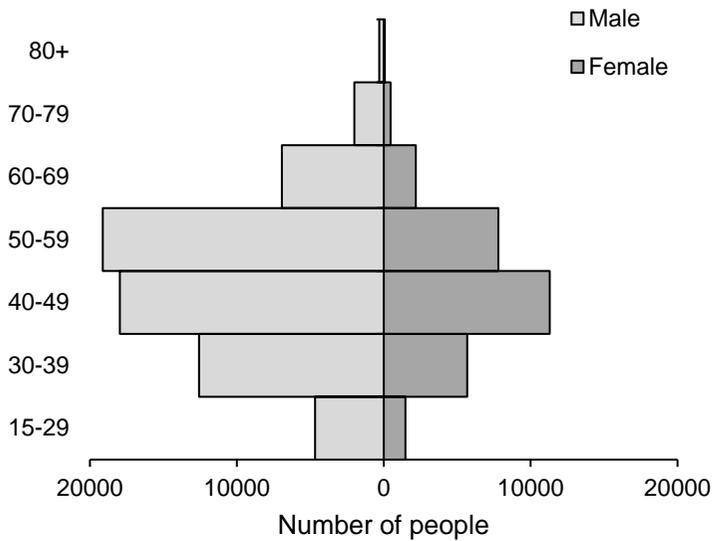
**Supplementary Figure 1:** Matching COVID-19 death data to the national HIV surveillance dataset: England, June 2020



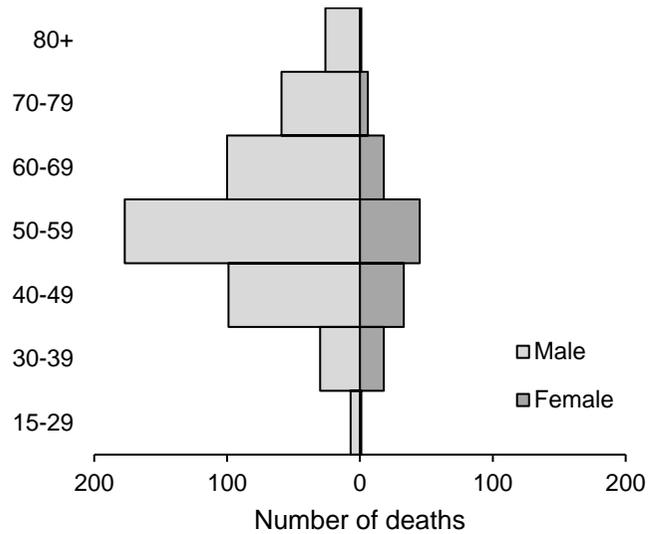
\*Matching based on Soundex (scrambled surname), first initial, date of birth, gender and lower super output area (LSOA) of residence

**Supplementary Figure 2: Age and sex pyramid of population size and deaths in those with diagnosed HIV and those without: England**

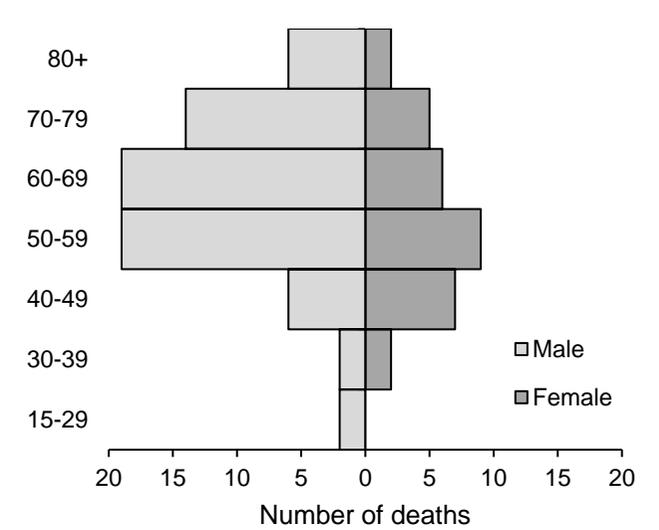
a) Diagnosed HIV population (England, 2019)



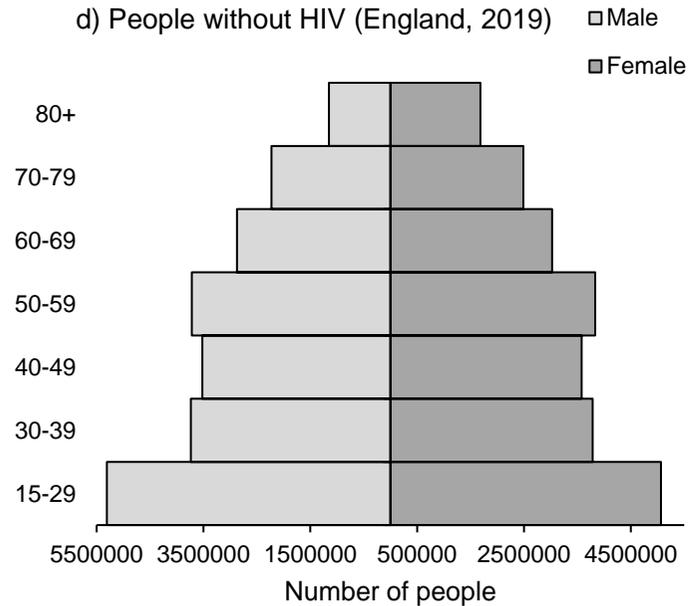
b) All deaths in people with diagnosed HIV (England, 2019)



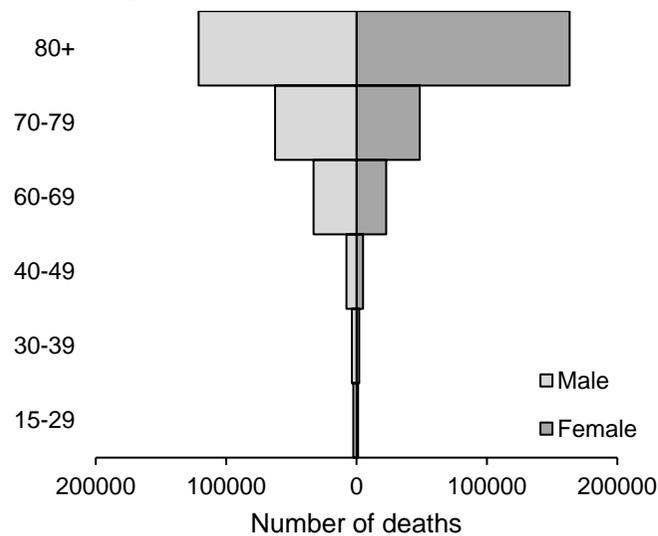
c) COVID-19 deaths in people with diagnosed HIV (England, Mar-Jun 2020)



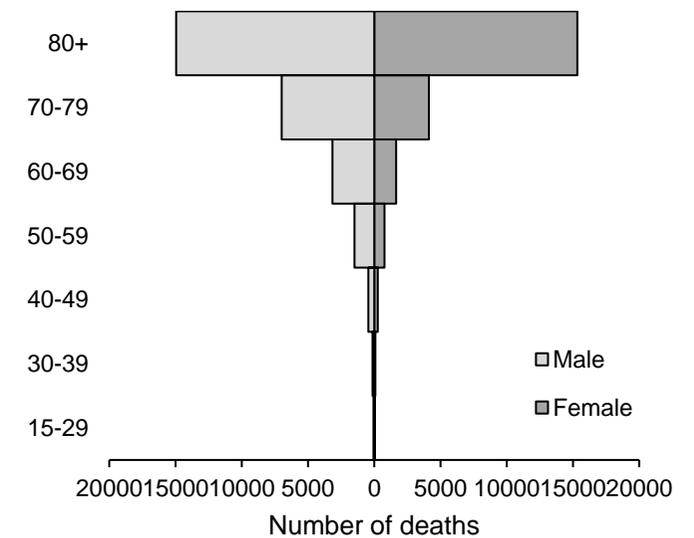
d) People without HIV (England, 2019)



e) All deaths in people without HIV (England, 2019)



f) COVID-19 deaths in people without HIV (England Mar-Jun 2020)



**Supplementary Table 1: Characteristics of people living with HIV\* by gender and ethnicity: England**

		All			Gender						Ethnicity								
					Men			Women			White			Black			Other		
		n	N	%	n	N	%	n	N	%	n	N	%	n	N	%	n	N	%
<b>Total</b>		<b>92,643</b>			<b>63,585</b>			<b>28,978</b>			<b>48,526</b>			<b>32,480</b>			<b>9,465</b>		
Year diagnosed with HIV	2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2018-2019	7,401	92,643	8.0%	5,631	63,585	8.9%	2,053	28,978	7.1%	3,700	48,526	7.6%	1,759	32,480	5.4%	1,126	9,465	12%
	2006-2017	48,706	92,643	53%	34,535	63,585	54%	14,150	28,978	49%	26,581	48,526	55%	15,702	32,480	48%	5,532	9,465	58%
	<2006	31,574	92,643	34%	20,463	63,585	32%	11,109	28,978	38%	16,126	48,526	33%	13,119	32,480	40%	2,302	9,465	24%
Median time living with diagnosed HIV [IQR]		11 years [5-16 years]			10 years [5-16 years]			12 years [7-16 years]			10 years [5-16 years]			13 years [7-16 years]			8 years [4-14 years]		
Ever on HIV treatment		90,346	91,921	98%	62,017	63,156	98%	28,060	28,685	98%	47,446	48,526	98%	31,928	32,480	98%	9,220	9,465	97%
Median time since HIV treatment initiation [IQR]		9 years [4-14years]			8 years [4-14 years]			11 years [6-15 years]			8 years [4-14years]			11 years [6-15 years]			7 years [3-12 years]		
HIV treatment at last attendance		90,049	91,921	98%	61,768	63,156	98%	27,984	28,685	98%	47,512	48,526	98%	31,640	32,480	97%	9,162	9,465	97%
CD4 count (cells/mm <sup>3</sup> )**	<50	411	44,709	0.92%	262	30,155	0.87%	149	14,513	1.0%	169	23,240	0.73%	176	16,010	1.1%	42	4,428	0.95%
	50-199	2,635	44,709	5.9%	1,753	30,155	5.8%	877	14,513	6.0%	1,205	23,240	5.2%	1,085	16,010	6.8%	252	4,428	5.7%
	200-349	6,162	44,709	14%	4,276	30,155	14%	1,882	14,513	13%	2,817	23,240	12%	2,521	16,010	16%	627	4,428	14%
	350-499	9,182	44,709	21%	6,314	30,155	21%	2,861	14,513	20%	4,430	23,240	19%	3,542	16,010	22%	1,005	4,428	23%
	≥500	26,319	44,709	59%	17,550	30,155	58%	8,744	14,513	60%	14,619	23,240	63%	8,686	16,010	54%	2,502	4,428	57%
Viral load measurement (copies/mL)**	<50	75,585	82,950	91%	52,605	57,558	91%	22,941	25,340	91%	41,120	44,694	92%	25,537	28,306	90%	7,634	8,444	90%
	50-199	3,488	82,950	4.2%	2,495	57,558	4.3%	989	25,340	3.9%	1,822	44,694	4.1%	1,230	28,306	4.3%	352	8,444	4.2%
	200-1,499	1,479	82,950	1.8%	928	57,558	1.6%	545	25,340	2.2%	626	44,694	1.4%	648	28,306	2.3%	163	8,444	1.9%
	≥1500	2,398	82,950	2.9%	1,530	57,558	2.7%	865	25,340	3.4%	1,126	44,694	2.5%	891	28,306	3.1%	295	8,444	3.5%
Body mass index (BMI)†	Underweight	78	3,966	2.0%	48	2,903	1.6%	27	979	2.5%	48	2,487	1.9%	15	917	1.6%	13	512	2.7%
	Normal weight	1,691	3,966	41%	1,393	2,903	47%	269	979	27%	1,218	2,487	49%	194	917	21%	262	512	50%
	Overweight	1,323	3,966	33%	1,012	2,903	35%	286	979	28%	835	2,487	34%	317	917	33%	156	512	31%
	Obese	874	3,966	24%	450	2,903	16%	397	979	42%	386	2,487	15%	391	917	44%	81	512	17%
Co-morbidities†	Any comorbidity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	CVD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hypertension	935	4,058	24%	660	2,882	24%	255	1,089	24%	521	2,436	22%	294	1,040	29%	104	528	21%
	Diabetes mellitus	279	3,982	7.7%	180	2,843	6.8%	88	1,055	9.0%	145	2,405	6.3%	92	1,002	9.8%	39	525	8.3%
	COPD	151	4,052	3.6%	125	2,907	4.2%	25	1,063	2.4%	127	2,460	5.1%	13	1,022	1.5%	11	518	2.6%
	Kidney disease	196	4,019	5.2%	148	2,875	5.3%	42	1,060	4.9%	111	2,423	4.7%	53	1,026	5.3%	30	519	6.8%
	Dementia/cognitive impairment	14	4,023	0.36%	8	2,873	0.27%	5	1,066	0.50%	9	2,424	0.32%	4	1,028	0.46%	1	518	0.36%

*IQR=interquartile range; CVD=cardiovascular disease; COPD=chronic obstructive pulmonary disease*

*\*People living with HIV - people who accessed HIV care in 2019, last seen for HIV care in 2018 and not known to have died by the end of 2019 and newly diagnosed with HIV in 2018 and 2019 but not yet seen for care; clinical data (CD4, viral load and ART at death) as of last HIV outpatient attendance*

*\*\*Measured within a year of last attendance*

*†Data from Positive Voices 2017 on self-reported diagnosed conditions. Raw numbers and weighted proportions are presented.*

*Proportions may not add up to 100% due to rounding.*

**Supplementary Table 2:** Impact of region of residence and deprivation on with dying of/with COVID-19: England, 2nd March to 16th June 2020

Exposure variables		Number of deaths	Adjusted Risk Ratio <sup>†</sup>			Adjusted Risk Ratio <sup>††</sup>			Adjusted Risk Ratio <sup>†††</sup>			Adjusted Risk Ratio <sup>††††</sup>		
			aRR	95% CI	p value <sup>**</sup>	aRR	95% CI	p value <sup>‡</sup>	aRR	95% CI	p value <sup>**</sup>	aRR	95% CI	p value <sup>‡</sup>
Gender	Men	27,272	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
	Women	22,310	0.58	0.52-0.65	<0.001	0.59	0.55-0.63	<0.001	0.56	0.49-0.65	<0.001	0.58	0.54-0.61	<0.001
Age at death*	15-19	13	1.77	1.74-1.80	<0.001	1.79	1.78-1.81	<0.001	1.77	1.74-1.81	<0.001	1.79	1.78-1.81	<0.001
	20-29	80												
	30-39	226												
	40-49	726												
	50-59	2,290												
	60-69	4,840												
	70-79	11,120												
	≥90	10,745												
Region	London	8,704	1.00	-	-	1.00	-	-						
	South	9,996	0.28	0.24-0.35		0.34	0.30-0.38							
	Midlands	15,054	0.46	0.39-0.54		0.53	0.48-0.59							
	North	15,448	0.47	0.39-0.55	<0.001	0.57	0.51-0.63	<0.001						
	Unknown	380	-	-	-	-	-	-						
IMD	1 – most deprived	11,261							1.00	-	-	1.00	-	-
	2	10,608							0.78	0.65-0.94		0.79	0.71-0.86	
	3	9,556							0.56	0.46-0.67		0.56	0.51-0.62	
	4	9,324							0.44	0.36-0.53		0.47	0.43-0.52	
	5 – least deprived	8,444							0.36	0.29-0.43	<0.001	0.39	0.35-0.43	<0.001
	Unknown	389							-	-	-	-	-	-
HIV status	Without HIV	49,483	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
	With HIV	99	3.45	2.74-4.35	<0.001	2.61	2.10-3.25	<0.001	3.74	2.94-4.75	<0.001	3.00	2.44-3.69	<0.001

IMD=index of multiple deprivation; aRR=adjusted risk ratio; CI=confidence interval

\*Age at death modelled as a continuous variable

\*\* $\chi^2$  test

† Adjusted for age at death and each explanatory variable (gender, HIV status or region of residence)

†† Adjusted for all explanatory variables (gender, age at death, HIV status and region of residence)

††† Adjusted for age at death and each explanatory variable (gender, HIV status or IMD)

†††† Adjusted for all explanatory variables (gender, age at death, HIV status and IMD)

‡ Likelihood ratio test

