

## Supplementary Online Content

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**eTable 1.** *International Classification of Diseases (ICD)-10* Codes for Underlying Cause of Death

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This supplementary material has been provided by the authors to give readers additional information about their work.

<b>eTable1. International Classification of Diseases (ICD)-10 Codes for Underlying Cause of Death</b>		
<b>Underlying Cause of Death Categorization</b>		<b>ICD-10</b>
Natural Causes		
<i>Certain infectious and parasitic diseases (A00-B99)</i>	Sepsis	A40-A41
	Viral hepatitis	B15-B19
	HIV disease	B20-B24
	Other and unspecified infectious and parasitic diseases and their sequelae	A00, A05, A20-A36, A42-A44, A48-A49, A54-A79, A81-A82, A85.0-A85.1, A85.8, A86-B04, B06-B09, B25-B49, B55-B99
<i>Neoplasms (C00-D48)</i>	Malignant neoplasms of lip, oral cavity, pharynx, larynx	C00-C14, C32
	Malignant neoplasm of esophagus	C15
	Malignant neoplasms of colon, rectum and anus	C18-C21
	Malignant neoplasms of liver and intrahepatic bile ducts	C22, D37.6
	Malignant neoplasm of pancreas	C25
	Malignant neoplasms of trachea, bronchus and lung	C33-C34, D38.1
	Malignant neoplasm of breast, cervix uteri, corpus uteri and uterus, ovary	C50, C53-C56
	Malignant neoplasm of prostate	C61
	Malignant neoplasms of lymphoid, hematopoietic and related tissue	C81-C96
All other and unspecified malignant neoplasms (e.g., bladder, brain, stomach, skin, kidney and renal pelvis)	C17, C23-C24, C26-C31, C37-C41, C44-C49, C51-C52, C57-C60, C62-C63, C66, C68-C69, C73-C80, C97	
<i>Diseases of the blood (D50-D89)</i>	Diseases of the blood (anemias, hemorrhagic conditions, disorders involving the immune mechanism)	D50-D89
<i>Endocrine, nutritional and metabolic diseases (E00-E90)</i>	Diabetes mellitus	E10-E14
	All other endocrine, nutritional and metabolic diseases	E00-E32, E34.0-E34.2, E34.4-E34.9, E65-E83, E85, E88
<i>Mental and behavioral disorders</i>	Dementia and delirium	F01-F05, G30
	Psychoactive substance use disorder	F10-F19

<i>(F00-F99)</i>	Alcohol use disorder	F10
	Other substance use disorders	F11-F19
	Other and unspecified mental and behavioral disorders	F06-F07, F09, F20-F48, F50-F99
<i>Diseases of the nervous system (G00-G99)</i>	Anoxic brain injury	G93.1
	Other diseases of nervous system	G04, G06-G11, G12.1-G12.9, G20-G72, G81-G92, G93.0, G93.2-G93.9, G95-G98
<i>Diseases of the circulatory system (I00-I99)</i>	Major cardiovascular diseases	I00-I78
	Cerebrovascular diseases	I60-I69
	Other disorders of circulatory system	I80-I99
<i>Diseases of the respiratory system (J00-J99)</i>	Influenza and pneumonia	J09-J18
	Chronic lower respiratory diseases (COPD, chronic bronchitis and asthma)	J40-J47
	Other and unspecified diseases of respiratory system	J00-J06, J30-J39, J67, J70-J98
<i>Diseases of the digestive system (K00-K93)</i>	Liver disease	K70-K77
	All other and unspecified diseases of digestive system	K00-K14, K20-K31, K35-K38, K40-K46, K50-K52, K55-K67, K80-K87, K90-K93
<i>Diseases of the skin and subcutaneous tissue (L00-L99)</i>	Diseases of the skin and subcutaneous tissue	L00-L99
<i>Diseases of the musculoskeletal system and connective tissue (M00-M99)</i>	Diseases of the musculoskeletal system and connective tissue	M00-M99
<i>Diseases of the genitourinary system (N00-N99)</i>	Renal failure and other disorders of kidney	N17-N19, N25, N27
	Other and unspecified diseases of genitourinary system	N00-N15, N20-N23, N26, N28-N95
<i>Pregnancy, childbirth and the puerperium (O00-O99)</i>	Pregnancy, childbirth and the puerperium	O00-O99
<i>Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)</i>	Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99

<i>Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)</i>	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00-R99
External Causes		
<i>Accidents (V01-X59, Y10-Y34)</i>	Transport accidents	V01-V99, Y85
	Non-transport accidents (non-poisoning)	W00-X59, Y86
	Drug overdose	X40-X44, Y10-Y14
	Alcohol poisoning	X45, Y15
<i>Intentional self-harm (X60-X84)</i>	Suicide	U03, X60-X84, Y87.0
<i>Assault (X85-Y09)</i>	Homicide	U01-U02, X85-Y09, Y87.1
<i>Legal interventions and operations of war (Y35-Y36)</i>	Legal interventions and operations of war	Y35, Y89.0
<i>Complications of medical and surgical care (Y40-Y84)</i>	Complications of medical and surgical care	Y40-Y84, Y88
Adapted from: Heron M. Deaths: Leading causes for 2017. National Vital Statistics Reports; vol 68 no 6. Hyattsville, MD: National Center for Health Statistics. 2019.		

**eTable 2. Mortality Rate Differences for the 5 Leading Causes of Death Among Women in the BHCHP Cohort Compared to Women in the Urban Northeast US Population, 2003-2018**

	Entire BHCHP Cohort		Black, Non-Hispanic/Latinx		Hispanic/Latinx		White, Non-Hispanic/Latinx	
Age strata	COD	Rate Difference (95% CI)	COD	Rate Difference (95% CI)	COD	Rate Difference (95% CI)	COD	Rate Difference (95% CI)
18-34	Drug overdose	182.7 (151.1-214.2)	Drug overdose	24.7 (1.4-48.0)	Drug overdose	81.2 (39.4-122.9)	Drug overdose	444.4 (357.2-531.6)
	PSUD	34.9 (21.2-48.5)	Diabetes	12.6 (-3.8-29.1)	PSUD	15.5 (-2.6-33.5)	PSUD	68.8 (34.8-102.8)
	Suicide	17.1 (6.8-27.5)	Homicide	6.5 (-10.0-22.9)	NA	NA	Suicide	39.5 (12.6-66.4)
	Ill-defined	10.7 (2.7-18.7)	CVD	7.1 (-9.4-23.5)	NA	NA	Ill-defined	33.1 (9.0-57.2)
	Other accidents <sup>a</sup>	1.5 (-5.6-8.6)	PSUD	13.8 (-2.7-30.2)	NA	NA	Other accidents <sup>a</sup>	9.5 (-9.5-28.5)
35-49	Drug overdose	285.9 (244.1-327.7)	Drug overdose	118.2 (66.2-170.2)	Drug overdose	136.0 (74.1-198.0)	Drug overdose	566.6 (469.4-663.7)
	CVD	50.3 (29.6-71.1)	CVD	17.6 (-19.2-54.4)	Liver disease	58.1 (17.5-98.6)	PSUD	131.2 (84.7-177.6)
	PSUD	68.1 (47.7-88.4)	Cancer	-16.8 (-50.6-17.1)	CVD	40.4 (2.2-78.6)	CVD	87.5 (46.4-128.6)
	Cancer	8.4 (-10.2-26.9)	HIV	14.6 (-16.0-45.2)	PSUD	38.8 (5.7-71.9)	Cancer	27.5 (-7.4-62.3)
	Liver disease	38.5 (22.5-54.5)	PSUD <sup>b</sup>	26.8 (1.8-51.7)	HIV	21.9 (-8.4-52.1)	Liver disease	56.4 (24.6-88.2)
50-64	Cancer	64.9 (13.6-116.2)	Cancer	60.4 (-38.0-158.8)	CVD	66.2 (-34.4-166.8)	Drug overdose	349.9 (259.5-440.4)
	Drug overdose	226.2 (178.9-273.6)	CVD	84.0 (-5.6-173.6)	Drug overdose	100.7 (13.6-187.8)	Cancer	80.0 (-2.9-162.9)
	CVD	125.5 (78.3-172.6)	Drug overdose	119.9 (57.4-182.3)	Liver disease	94.7 (7.6-181.8)	Liver disease	213.0 (141.2-284.8)
	Liver disease	129.3 (92.5-166.0)	HIV	46.9 (1.5-92.2)	Cancer	-49.4 (-129.0-30.1)	CVD	132.8 (61.9-203.6)
	PSUD	69.1 (42.9-95.3)	Liver disease	48.7 (5.7-91.7)	PSUD	69.3 (-1.8-140.4)	Lower resp.	85.4 (36.6-134.1)
65-79	Cancer	-12.0 (-181.6-157.6)	Cancer	93.6 (-272.8-460.0)	CVD	-180.8 (-439.4-77.9)	Drug overdose	88.4 (-14.1-191.0)

	CVD	-56.4 (-204.3-91.5)	CVD	-196.9 (-496.1-102.3)	NA	NA	CVD	108.3 (-156.5-373.2)
	Lower resp.	82.3 (-10.6-175.2)	Cerebrovascular disease	61.5 (-111.3-234.2)	NA	NA	Lower resp.	231.8 (26.7-437.0)
	Liver disease	75.2 (7.3-143.0)	Sepsis	74.5 (-75.0-224.1)	NA	NA	Liver disease	127.3 (-5.1-259.7)
	Cerebrovascular disease	2.3 (-61.2-65.8)	NA	NA	NA	NA	Viral hepatitis <sup>c</sup>	87.6 (-15.0-190.2)

<sup>a</sup> Other accidents ICD-10: W00-X59, Y16-Y36, Y86.

<sup>b</sup> Tie in number of deaths; cause of death with largest rate difference displayed in table. Other cause = lower respiratory disease, rate difference: 25.3 (0.3-50.3)

<sup>c</sup> Tie in number of deaths; cause of death with largest rate difference displayed in table. Other causes = Cancer, rate difference: 68.9 (-227.3-365.0); Diabetes, rate difference: 41.1 (-61.5-143.6); Other digestive diseases, rate difference: 48.6 (-54.0-151.2).

Abbreviation legend: "BHCHP"=Boston Health Care for the Homeless Program; "CVD"=cardiovascular disease; "HIV"= human immunodeficiency virus; "Lower resp."=chronic lower respiratory disease; "PSUD"=psychoactive substance use disorder; "NA"=not available

"PSUD" includes ICD-10 codes for mental and behavioral disorders due to psychoactive substance use (codes F10-19) and is generally intended for deaths related to a chronic pattern or sequelae of substance use rather than acute poisoning which is documented as "drug overdose" (codes X40-X44, Y10-Y14)

**eTable 3. Mortality Rate Differences for the 5 Leading Causes of Death Among Men in the BHCHP Cohort Compared to Men in the Urban Northeast US Population, 2003-2018**

	Entire BHCHP Cohort		Black, Non-Hispanic/Latinx		Hispanic/Latinx		White, Non-Hispanic/Latinx	
Age strata	COD	Rate Difference (95% CI)	COD	Rate Difference (95% CI)	COD	Rate Difference (95% CI)	COD	Rate Difference (95% CI)
18-34	Drug overdose	466.4 (410.4, 522.4)	Drug overdose	103.1 (45.9-160.3)	Drug overdose	204.4 (124.4-284.3)	Drug overdose	763.8 (656.7-871.0)
	Suicide	36.8 (19.1-54.5)	Homicide	-22.5 (-73.8-28.7)	PSUD	43.3 (6.9-79.6)	Suicide	68.6 (34.2-103.0)
	PSUD	47.3 (29.6-64.9)	CVD	23.0 (-10.0-56.0)	Ill-defined	19.7 (-6.0-45.4)	PSUD	69.9 (37.9-101.9)
	Homicide	4.1 (-11.0-19.1)	Suicide	9.7 (-15.9-35.3)	Homicide	1.0 (-24.7-26.7)	Ill-defined	52.4 (23.9-80.8)
	Ill-defined	28.2 (13.9-42.5)	Cancer	13.8 (-11.8-39.4)	NA	NA	Transport accident	16.0 (-3.4-35.4)
35-49	Drug overdose	398.1 (361.4-434.8)	Drug overdose	108.8 (68.2-149.4)	Drug overdose	280.4 (212.6-348.2)	Drug overdose	656.3 (584.0-728.6)
	CVD	59.0 (40.0-78.0)	CVD	-4.8 (-38.7-29.1)	CVD	24.8 (-5.7-55.4)	CVD	114.0 (79.0-148.9)
	PSUD	73.3 (57.4-89.2)	Cancer	-8.2 (-32.2-15.7)	PSUD	42.4 (14.7-70.1)	PSUD	140.6 (107.3-173.8)
	Cancer	26.3 (11.7-40.8)	HIV	-10.3 (-32.1-11.5)	HIV	23.8 (-3.0-50.5)	Liver disease	93.3 (65.2-121.4)
	Liver disease	46.8 (33.3-60.2)	Homicide	-6.6 (-25.9-12.7)	Cancer	5.9 (-17.5-29.3)	Cancer	52.2 (25.9-78.4)
50-64	CVD	176.8 (139.3-214.3)	Cancer	22.6 (-39.7-84.9)	Drug overdose	246.0 (162.3-329.7)	CVD	372.2 (307.8-436.7)
	Cancer	144.0 (107.9-180.1)	CVD	-82.3 (-140.5--24.1)	Cancer	56.7 (-22.1-135.5)	Cancer	247.0 (188.3-305.6)
	Drug overdose	288.6 (256.3-320.8)	Drug overdose	130.5 (86.4-174.6)	Liver disease	122.7 (57.6-187.8)	Drug overdose	412.3 (357.5-467.1)
	PSUD	159.0 (135.2-182.7)	PSUD	68.9 (37.8-100.1)	CVD	-34.9 (-98.8-29.1)	PSUD	260.3 (217.2-303.4)

	Liver disease	129.6 (106.4-152.8)	Liver disease	43.3 (14.0-72.7)	HIV	50.8 (3.0-98.6)	Liver disease	201.2 (160.9-241.4)
65-79	Cancer	185.8 (56.0-315.6)	Cancer	288.6 (3.3-573.9)	Cancer	-55.8 (-343.4-231.9)	CVD	366.1 (174.5-557.7)
	CVD	174.3 (44.5-304.1)	CVD	-192.3 (-439.0-54.5)	CVD	-250.0 (-511.2-11.1)	Cancer	166.3 (-12.8-345.5)
	Lower resp.	103.8 (43.6-164.1)	Diabetes	79.7 (-42.7-202.0)	Lower resp.	174.1 (-10.3-358.6)	Lower resp.	134.5 (43.3-225.6)
	Diabetes	59.1 (8.8-109.4)	Lower resp.	12.8 (-79.0-104.5)	PSUD	128.2 (-11.2-267.6)	Drug overdose	149.9 (82.0-217.8)
	Drug overdose	115.1 (71.0-159.2)	Renal failure <sup>a</sup>	22.9 (-58.0-103.8)	Cerebrovascular disease	53.3 (-86.1-192.8)	Other resp. diseases <sup>b</sup>	84.3 (19.9-148.8)

<sup>a</sup>Tie in number of deaths; cause of death with largest rate difference displayed in table. Other causes = Cerebrovascular disease, rate difference: -46.8 (-127.9-34.2)

<sup>b</sup>Other resp. diseases ICD-10: J00-J06, J20-J22, J30-J39, J60-J70, J80-J84, J85-J86, J90-J94, J96-J98.

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