

Appendix 1. Maternal Mortality Rates Adjusted for Maternal Age, United States, 2000-2002, and 2015-2018

Methods

Data for analysis was obtained from the 3 reports on maternal mortality published by the National Center for Health Statistics [1-3], the Births and Detailed Mortality databases of the CDC Wonder online databases (<https://wonder.cdc.gov/>), and the Mortality Multiple Causes of Death database (https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm) for 2018. All classifications of race and ethnicity in the data were those made within the data files of the National Center for Health Statistics.

Age-adjustment to assess temporal trends was carried out using indirect standardization [4] to estimate Standardized Mortality Ratios (SMR) for the years 2000, 2001, 2002, 2015, 2016, 2017 and 2018. The choice of indirect standardization was dictated by availability of maternal age distributions for all live births, the total number of maternal deaths and the age distribution of maternal deaths for the year 2000. Direct standardization and regression analysis were not possible for several reasons including the absence of information on the age distribution of maternal deaths for 2015-2017. 2000 was chosen as the reference year and SMRs, 95% confidence intervals and tests for statistical significance were calculated [4].

References

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Appendix 1 (continued).

Age-Specific Maternal Deaths*, Live Births, and Maternal Death Rates in the United States for the Year 2000, and Live Births, Expected Maternal Deaths, Observed Maternal Deaths, and Standardized Mortality Ratios for 2001, 2002, and 2015-2018

Maternal age	2000			2001		2002		2015		2016		2017		2018	
	Live births	Maternal deaths		Live births	Exp. deaths	Live births	Exp. deaths	Live births	Exp. deaths	Live births	Exp. deaths	Live births	Exp. deaths	Live births	Exp. deaths
		No.	Rate												
<15	8519	0	0.0	7781	0	7315	0	2500	0	2253	0	1917	0	1736	0
15-19	468990	18	3.8	445944	17	425493	16	229715	9	209809	8	194377	7	179871	7
20-24	1017806	75	7.4	1021627	75	1022106	75	850509	63	803978	59	764780	56	726175	54
25-29	1087547	86	7.9	1058265	84	1060391	84	1152311	91	1149122	91	1123577	89	1099491	87
30-34	929278	93	10.0	942697	94	951219	95	1094693	110	1111042	111	1091917	109	1090697	109
35-39	452057	86	19.0	451723	86	453927	86	527996	100	547488	104	554796	106	566786	108
40-44	90013	33	36.7	92813	34	95788	35	111848	41	113140	41	114813	42	117381	43
45-49	4349	4	92.0	4844	4	5224	5	8171	8	8257	8	8483	8	8616	8
50+	255	1	392.2	239	1	263	1	754	3	786	3	840	3	959	4
Total	4058814	396	9.8	4025933	396	4021726	398	3978497	424	3945875	426	3855500	421	3791712	419
Observed deaths		396		399		357		345		345		442		331	
Expected deaths		396		396		398		424		426		421		419	
Std mortality ratio		1.00		1.01		0.90		0.81		0.81		1.05		0.79	
95% CI		0.90-1.10		0.91-1.11		0.81-0.99		0.74-0.89		0.74-0.89		0.95-1.16		0.72-0.87	
P value		-		0.87		0.03		<0.001		<0.001		0.30		<0.001	

*Maternal death counts in the United States, identified without use of the pregnancy checkbox [6-8].

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Appendix 2. Temporal Trends in Broad Cause of Death Categories of Maternal Death, United States, 1999-2018

Numbers and Rates of Maternal Death Within Underlying Cause-of-Death Categories Unaffected by the Introduction of the Pregnancy Checkbox*, United States, 1999-2018

Year	Live births	Abortive outcomes		Hypertensive disorders		Other maternal disorders		Fetal, amniotic or delivery problems		Labor and delivery complications		Puerperal complications		Mental or CNS disorders		Respiratory system diseases	
		No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1999	3959417	31	7.8	82	20.7	20	5.1	41	10.4	60	15.2	84	21.2	0	0.1	3	1.1
2000	4058814	37	9.1	63	15.5	32	7.9	23	5.7	66	16.3	93	22.9	1	0.1	6	0.8
2001	4025933	38	9.4	70	17.4	23	5.7	31	7.7	61	15.2	101	25.1	0	0.2	1	0.7
2002	4021726	22	5.5	50	12.4	25	6.2	21	5.2	58	14.4	82	20.4	2	0.3	1	0.9
2003	4089950	40	9.8	65	15.9	34	8.3	28	6.8	74	18.1	88	21.5	2	0.7	9	2.0
2004	4112052	32	7.8	54	13.1	34	8.3	36	8.8	47	11.4	102	24.8	4	1.4	14	2.4
2005	4138349	33	8.0	59	14.3	45	10.9	26	6.3	51	12.3	122	29.5	11	1.9	7	1.9
2006	4265555	26	6.1	56	13.1	39	9.1	22	5.2	66	15.5	109	25.6	9	2.0	3	1.3
2007	4316233	31	7.2	57	13.2	41	9.5	20	4.6	58	13.4	93	21.5	5	1.6	6	1.5
2008	4247694	34	8.0	65	15.3	50	11.8	30	7.1	62	14.6	114	26.8	6	2.4	10	3.0
2009	4130665	34	8.2	62	15.0	51	12.3	24	5.8	46	11.1	112	27.1	19	2.7	22	4.3
2010	3999386	37	9.3	63	15.8	48	12.0	32	8.0	48	12.0	101	25.3	8	3.1	21	4.6
2011	3953590	27	6.8	80	20.2	61	15.4	34	8.6	50	12.6	96	24.3	10	2.8	13	3.9
2012	3952841	17	4.3	60	15.2	48	12.1	24	6.1	43	10.9	89	22.5	15	3.9	13	3.6
2013	3932181	27	6.9	71	18.1	73	18.6	28	7.1	33	8.4	128	32.6	21	4.1	17	4.3
2014	3988076	28	7.0	55	13.8	83	20.8	34	8.5	26	6.5	92	23.1	13	4.1	21	3.5
2015	3978497	19	4.8	63	15.8	63	15.8	22	5.5	39	9.8	94	23.6	15	4.2	4	3.1
2016	3945875	22	5.6	62	15.7	82	20.8	33	8.4	45	11.4	91	23.1	22	4.4	12	2.0
2017	3855500	19	4.9	70	18.2	89	23.1	43	11.2	38	9.9	93	24.1	15	4.1	8	2.5
2018	3791712	29	7.6	54	14.2	54	14.2	39	10.3	51	13.5	71	18.7	11	3.4	9	2.2
P value for trend		0.005		0.89		<0.001		0.06		<0.001		0.80		<0.001		<0.001	

Rates expressed per 1,000,000 live births.

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Appendix 2 (continued).

Numbers and Rates of Maternal Death Within Underlying Cause-of-Death Categories Unaffected by the Introduction of the Pregnancy Checkbox*, United States, 1999-2018 (Rates Expressed per 1,000,000 Live Births)

* Cause-of-death categories unaffected by the pregnancy checkbox refer to those categories which showed negligible/modest changes because of the pregnancy checkbox according to the National Center for Health Statistics [7; pp. 13, 24].

Abortive outcomes include deaths with a ICD-10 O00-O08 code as the underlying cause of death; Hypertensive disorders of pregnancy O10-O16 excluding O12; Other maternal disorders O20-O29 excluding O26.8; Maternal care related to fetus, amniotic cavity or delivery problems O30-O48; Complications of labor and delivery O60-O75; Complications related to the puerperium O85-O92; Mental disorders and CNS disease complicating pregnancy, childbirth or the puerperium O99.3; Respiratory diseases complicating pregnancy, childbirth or the puerperium O99.5.

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Appendix 3. Temporal Trends by Underlying Causes of Death Subcategories Within Categories Unaffected by the Introduction of the Pregnancy Checkbox, United States 1999-2018. Data from the CDC Wonder Detailed Mortality Database and the CDC Wonder Births Database. Accessed February 19, 2021.
<https://wonder.cdc.gov/WelcomeA.html>

Numbers and Rates of Maternal Death in Two Periods (1991-2001 vs 2016-2018) in Underlying Cause-of-Death Subcategories (Within Categories Unaffected by the Introduction of the Pregnancy Checkbox*), United States, 1999-2018

Condition	1999-2001		2016-2018		Rate ratio	95% confidence interval	P value	P value for trend
	Number	Rate	Number	Rate				
Live births	12,044,164	-	11,593,087	-	-	-	-	-
Pregnancy with abortive outcomes (O00-O07)	106	8.80	70	6.04	0.69	0.51-0.93	0.01	0.005
-Ectopic pregnancy (O00)	67	5.56	51	4.40	0.79	0.55-1.14	0.21	0.09
Tubal ectopic pregnancy (O001)	21	1.74	13	1.12	0.64	0.32-1.28	0.21	0.49
Ectopic pregnancy unspecified (O009)	44	3.65	35	3.02	0.83	0.53-1.29	0.40	0.11
-Hydatidiform mole (O01)	1	0.08	2	0.17	2.08	0.19-22.9	0.62	0.51
-Other abnormal products of conception (O02)	3	0.25	0	0.00	-	-	0.12	0.41
-Spontaneous abortion (O03)	15	1.25	8	0.69	0.55	0.23-1.31	0.21	0.25
-Medical abortion (O04)	5	0.42	0	0.00	-	-	0.03	0.01
-Other abortion (O05)	0	0.00	3	0.26	-	-	0.12	0.003
-Unspecified abortion (O06)	11	0.91	4	0.35	0.38	0.12-1.19	0.12	0.03
-Failed abortion (O07)	4	0.33	2	0.17	0.52	0.01-2.84	0.44	0.25
Hypertensive disorders (O10, O11, O12-O16)	215	17.9	186	16.0	0.90	0.74-1.09	0.29	0.89
-Chronic hypertension (O10, O11)	15	1.25	87	7.50	6.03	3.48-10.4	<0.001	<0.001
-Preeclampsia-eclampsia (O11, O14, O15)	198	16.4	103	8.88	0.54	0.43-0.69	<0.001	<0.001
-Edema and proteinuria (O12)	2	0.17	2	0.17	1.04	0.15-7.38	1.00	0.49
-Gestational hypertension (O13)	6	0.50	1	0.09	0.17	0.02-1.44	0.13	0.22
-Unspecified hypertension (O16)	30	2.49	36	3.11	1.25	0.77-2.02	0.37	0.03
Other maternal disorders (O20-O29)	75	6.23	225	19.4	3.12	2.40-4.05	<0.001	<0.001
-Early pregnancy hemorrhage (O20)	1	0.08	0	0.00	-	-	1.00	0.85
-Excessive vomiting (O21)	2	0.17	4	0.35	2.08	0.38-11.3	0.44	0.61
-Venous complications (O22)	28	2.32	32	2.76	1.19	0.72-1.97	0.51	0.10
-Genitourinary tract infections (O23)	7	0.58	17	1.47	2.52	1.05-6.08	0.04	<0.001

Rates expressed per 1,000,000 live births.

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Appendix 3 (continued).

Numbers and Rates of Maternal Death in Two Periods (1991-2001 vs 2016-2018) in Underlying Cause-of-Death Subcategories (Within Categories Unaffected by the Introduction of the Pregnancy Checkbox*), United States, 1999-2018

Condition	1999-2001		2016-2018		Rate ratio	95% confidence interval	P value	P value for trend
	Number	Rate	Number	Rate				
-Diabetes mellitus (O24)	11	0.91	57	4.92	5.38	2.82-10.3	<0.001	<0.001
-Malnutrition (O25)	0	0.00	7	0.60	-	-	0.007	0.007
-Other conditions (O26) excluding O268*	15	1.25	107	9.23	7.41	4.32-12.7	<0.001	<0.001
Liver disorders (O266)	15	1.25	102	8.80	7.06	4.11-12.1	<0.001	<0.001
-Abnormal antenatal screen (O28)	0	0.00	0	0.00	-	-	-	-
-Anesthesia in pregnancy (O29)	11	0.91	1	0.09	0.09	0.01-0.73	0.006	<0.001
Fetus, amniotic cavity, delivery problems (O30-O48)	95	7.89	115	9.92	1.26	0.96-1.65	0.10	0.06
-Multiple gestation complications (O30, O31)	4	0.33	4	0.35	1.04	0.26-4.15	1.00	0.76
-Malpresentation or disproportion (O32, O33)	2	0.17	0	0.00	-	-	0.50	0.03
-Pelvic organ abnormalities (O34)	2	0.17	0	0.00	-	-	0.50	0.69
-Fetal anomalies (O35)	1	0.08	0	0.00	-	-	1.00	0.19
-Known or suspected fetal problems (O36)	16	1.33	18	1.55	1.17	0.60-2.29	0.65	0.57
-Polyhydramnios (O40)	0	0.00	0	0.00	-	-	-	-
-Other disorders of amniotic fluid (O41)	7	0.58	15	1.29	2.23	0.91-5.46	0.09	0.002
-Premature rupture of membranes (O42)	6	0.50	3	0.26	0.52	0.13-2.08	0.35	0.23
Placental disorders (O43)	1	0.08	16	1.38	16.6	2.20-125.3	<0.001	<0.001
Adherent placenta (O432)	0	0.00	16	1.38	-	-	<0.001	<0.001
Placenta previa (O44)	5	0.42	2	0.17	0.42	0.08-2.14	0.45	0.48
Placental abruption (O45)	25	2.08	19	1.64	0.79	0.43-1.43	0.44	0.18
-Antepartum hemorrhage NEC (O46)	26	2.16	38	3.28	1.52	0.92-2.50	0.10	0.21
APH with coagulation defect (O460)	5	0.42	8	0.69	1.66	0.54-5.08	0.42	0.76
Other APH (O468)	7	0.58	2	0.17	0.30	0.06-1.43	0.18	0.36
APH unspecified (O469)	14	1.16	28	2.42	2.08	1.09-3.95	0.02	0.08
-False labour (O47)	0	0.00	0	0.00	-	-	-	-

Rates expressed per 1,000,000 live births. All subcategories (irrespective of temporal change between 1991-2001 and 2016-2018) are shown.

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Appendix 3 (continued).

Numbers and Rates of Maternal Death in Two Periods (1991-2001 vs 2016-2018) in Underlying Cause-of-Death Subcategories (Within Categories Unaffected by the Introduction of the Pregnancy Checkbox*), United States, 1999-2018

Condition	1999-2001		2016-2018		Rate ratio	95% confidence interval	P value	P value for trend
	Number	Rate	Number	Rate				
-Prolonged pregnancy (O48)	0	0.00	0	0.00	-	-	-	-
Labour and delivery complications (O60-O75)	187	15.5	134	11.6	0.74	0.60-0.93	0.009	<0.001
-Preterm birth (O60)	1	0.08	3	0.26	3.12	0.32-30.0	0.37	0.14
-Failed induction (O61)	0	0.00	-	0.00	-	-	-	-
-Abnormality forces of labor (O62)	6	0.50	5	0.43	0.87	0.26-2.84	1.00	0.43
-Long labour (O63)	0	0.00	1	0.09	-	-	0.49	0.23
-Obstructed labour (O64, O65, O66)	0	0.00	0	0.00	-	-	-	-
-Intrapartum hemorrhage NEC (O67)	17	1.41	2	0.17	0.12	0.03-0.53	<0.001	<0.001
-Fetal stress, cord complications (O68, O69)	0	0.00	1	0.09	-	-	0.49	0.98
-Perineal trauma (O70)	1	0.08	1	0.09	1.04	0.07-16.6	1.00	0.39
-Other obstet trauma incl rupture uterus (O71)	14	1.16	12	1.04	0.89	0.41-1.93	0.77	0.67
-Postpartum hemorrhage (O72)	45	3.74	33	2.85	0.76	0.49-1.19	0.23	0.05
-Anesthesia in labour or delivery (O74)	9	0.75	2	0.17	0.23	0.05-1.07	0.07	<0.001
-Other complications NEC (O75)	94	7.80	73	6.30	0.81	0.59-1.10	0.17	0.002
Shock (O751)	14	1.16	6	0.52	0.45	0.17-1.16	0.12	0.06
Other complications of surgery (O754)	38	3.16	46	3.97	1.26	0.82-1.93	0.29	0.70
Other complications (O758, O759)	40	3.32	21	1.81	0.55	0.32-0.93	0.02	<0.001
Puerperal complications (O85-O92)	278	23.1	255	22.0	0.95	0.80-1.13	0.58	0.80
-Puerperal sepsis, other infections (O85, O86)	15	1.25	21	1.81	1.45	0.75-2.82	0.32	0.05
-Venous complications (O87)	4	0.33	2	0.17	0.52	0.10-2.84	0.69	0.40
-Obstetric embolism (O88)	180	14.9	135	11.6	0.78	0.62-0.97	0.03	0.03
Amniotic fluid embolism (O881)	122	10.1	62	5.35	0.53	0.39-0.72	<0.001	<0.001
Blood-clot embolism (O882)	54	4.48	67	5.78	1.29	0.90-1.84	0.16	0.07
-Anesthesia complications (O89)	3	0.25	0	0.00	-	-	0.25	0.09

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Appendix 3 (continued).

Numbers and Rates of Maternal Death in Two Periods (1991-2001 vs 2016-2018) in Underlying Cause-of-Death Subcategories (Within Categories Unaffected by the Introduction of the Pregnancy Checkbox*), United States, 1999-2018

Condition	1999-2001		2016-2018		Rate ratio	95% confidence interval	P value	P value for trend
	Number	Rate	Number	Rate				
-Puerperal complications NEC (O90)	76	6.31	97	8.37	1.33	0.98-1.79	0.06	0.009
Cardiomyopathy (O903)		74	6	85	7.33	1.19	0.87-1.63	0.27
Other complications NEC (O908)	2	0.17	8	0.69	4.16	0.88-19.6	0.06	<0.001
-Breast infections and disorders (O91, O92)	0	-	0	-	-	-	-	-
Mental and CNS disorders (O993)	1	0.08	48	4.14	49.9	6.88-361.3	<0.001	<0.001
Diseases of the respiratory system (O995)	10	0.83	29	2.50	3.01	1.47-6.18	0.002	<0.001

*O26.8 Other specified pregnancy-related conditions excluded because this code was affected by the introduction of the pregnancy checkbox.

Bold type used to identify P value for difference (between 1999-2001 vs 2016-2018) or P value for linear trend (1999 to 2018) <0.05.

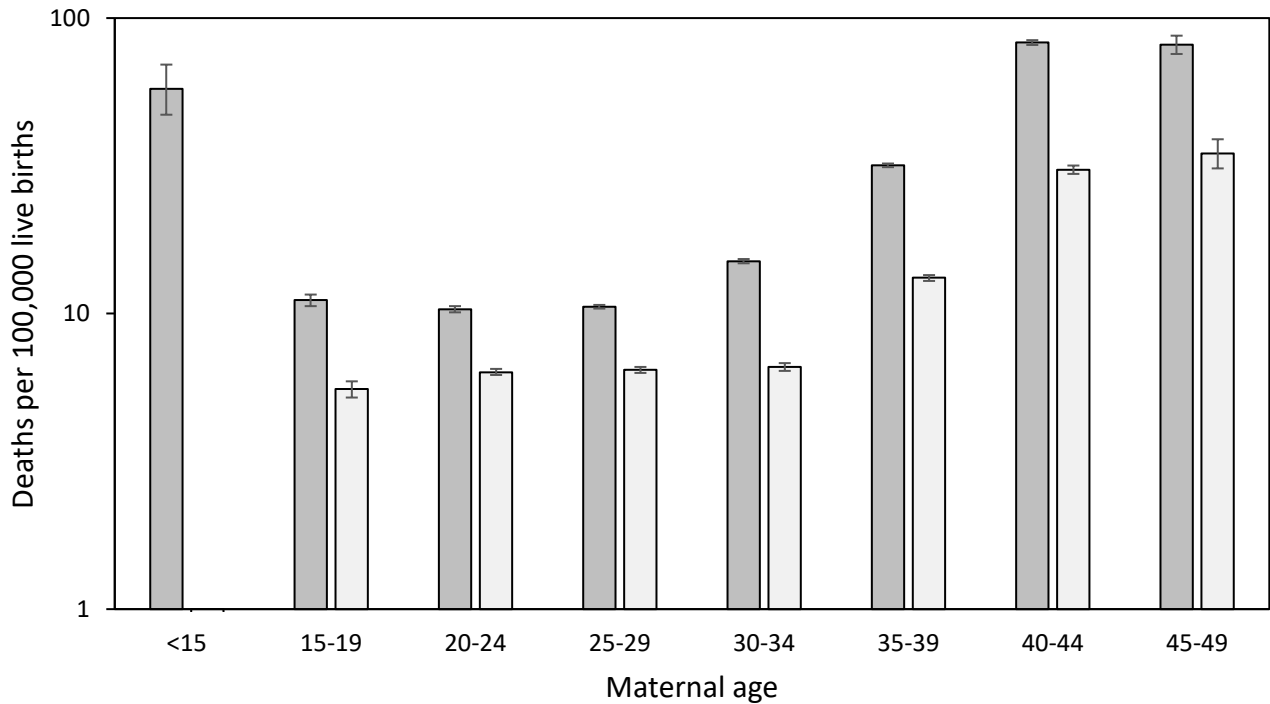
Rates expressed per 1,000,000 live births. All subcategories (irrespective of temporal change Between 1991-2001 and 2016-2018) are shown.

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Appendix 4. Age-specific rates of maternal death and late maternal death, United States, 2018. Vital Statistics Data Online Portal. National Center for Health Statistics. Accessed February 19, 2021. https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm



Note: Although maternal mortality rates showed a strong association with maternal age between 20-24 years and 40-44 years, there was no difference in maternal mortality rates between women aged 40-44 years versus those aged 45-49 years. The latter unexpected finding is likely the result of pregnancy checkbox use being restricted to women 10-44 years of age in 2018. Such differential use of the pregnancy checkbox results in some misclassification of non-maternal deaths (as maternal deaths) in the 10-44 years age range but not in the 45-49 years age group. An uncorrected overestimation of maternal deaths in the 40-44 years age group would have led to the lack of difference in maternal mortality rates between women 40-44 years and 45-49 years of age.

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Appendix 5. Continued Misclassification of Some Nonmaternal Deaths as Maternal Deaths

Misclassification of deaths among women 10-44 years

There are several reasons to suspect some misclassification of non-maternal deaths (as maternal deaths) among women 10-44 years in 2018 including the lack of difference in MMRs between women aged 40-44 years versus 45-49 years. Restricting pregnancy checkbox use to women 10-44 years of age curtailed misclassification of non-maternal deaths among women 45-49 years. However, uncorrected over-estimation of MMRs among women 40-44 years of age likely resulted in similar death rates among women 40-44 and 45-49 years of age.

Discrepant temporal trends between related causes of death (e.g., declines in preeclampsia deaths vs increases in deaths from chronic hypertension; Figure 2A) and the high proportion of maternal deaths due to less informative and potentially incidental causes of death are other indicators suggesting misclassification. Whereas obstetric causes of death on a death certificate (e.g., preeclampsia and amniotic fluid embolism) would be unaffected by the incorrect use of the pregnancy checkbox, non-obstetric causes of death among non-pregnant women (e.g., chronic hypertension and pulmonary embolism) would be misclassified as maternal deaths if the pregnancy checkbox was ticked erroneously. The 503% increase in MMRs from chronic hypertension between 1999-2001 and 2016-2018 (Appendix 3 above) far exceeds the documented 6-7% per year rise in chronic hypertension among pregnant women in the United States [1], and is likely due to a misclassification of non-maternal deaths due to chronic hypertension. Non-maternal deaths from hypertensive diseases among reproductive age women far exceed maternal deaths from chronic hypertension so that a small misclassification of non-maternal deaths from hypertensive diseases (due to a checkbox error) would significantly impact maternal deaths from chronic hypertension (see the table and figure in Appendix 5 below).

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Appendix 5 (continued).

Nonmaternal Deaths from Hypertensive Diseases Compared With Maternal Deaths From Chronic Hypertension

ICD-10 codes: Hypertensive diseases (non-maternal)

I10: Essential (primary) hypertension

I11: Hypertensive heart disease

I12: Hypertensive renal disease

I13: Hypertensive heart and renal disease

I15: Secondary hypertension

ICD-10 codes: Pre-existing hypertension in pregnancy, childbirth and the puerperium (maternal)

O100: Pre-existing essential hypertension complicating pregnancy, childbirth and the puerperium

O101: Pre-existing essential hypertensive heart disease complicating pregnancy, childbirth and the puerperium

O102: Pre-existing essential hypertensive renal disease complicating pregnancy, childbirth and the puerperium

O103: Pre-existing essential hypertensive heart and renal disease complicating pregnancy, childbirth and the puerperium

O104: Pre-existing secondary hypertension complicating pregnancy, childbirth and the puerperium

O109: Unspecified pre-existing hypertension complicating pregnancy, childbirth and the puerperium

O11: Pre-existing hypertensive disorder with superimposed proteinuria

Data from the CDC Wonder Database. National Center for Health Statistics Mortality. Centers for Disease Control and Prevention. Accessed February 19, 2021. <https://wonder.cdc.gov/Deaths-by-Underlying-Cause.html>

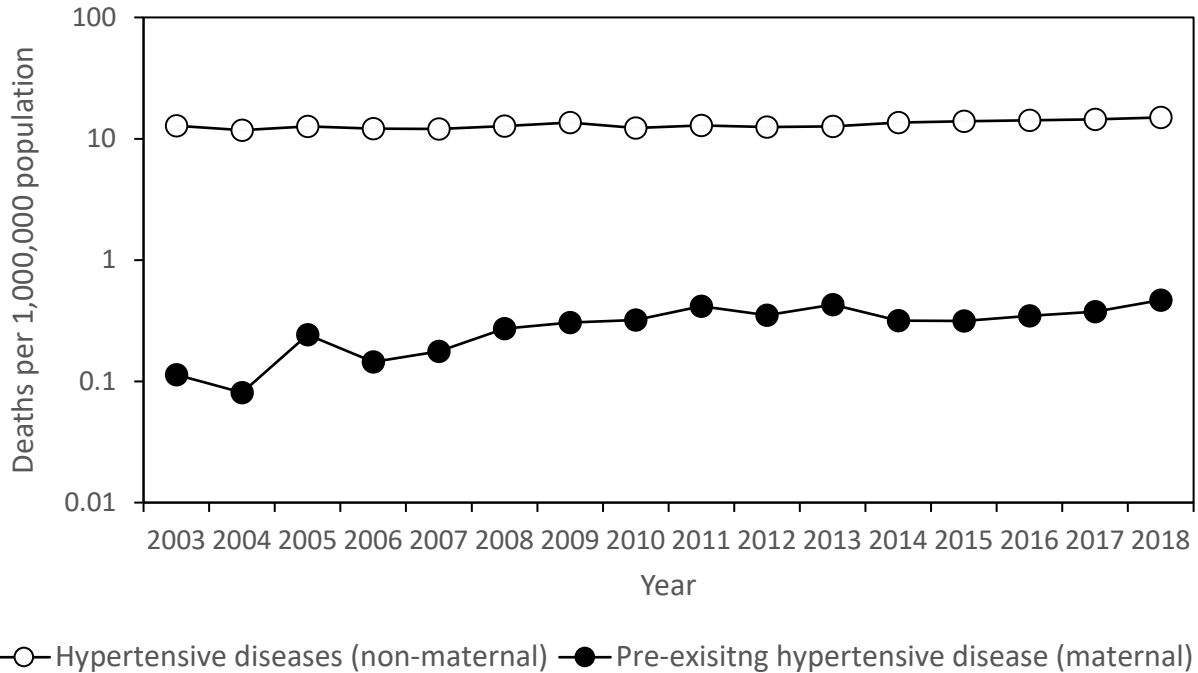
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Appendix 5 (continued).

Rates of death from hypertensive diseases (nonmaternal deaths ICD-10 I10 to I15) and rates of deaths from pre-existing hypertension complicating pregnancy, childbirth and the puerperium (O10 and O11) among women aged 15-44 years, United States, 2003-2018. Rates expressed per 1,000,000 (female) population. Data from the CDC Wonder Database. National Center for Health Statistics Mortality. Centers for Disease Control and Prevention. Accessed February 19, 2021. <https://wonder.cdc.gov/Deaths-by-Underlying-Cause.html>



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Appendix 5 (continued).

Numbers and Rates of Death From Hypertensive Diseases (i.e., Nonmaternal Deaths, ICD-10 Codes I10 to I15) and Deaths From Pre-existing Hypertension Complicating Pregnancy, Childbirth, and the Puerperium (Maternal Deaths, ICD-10 Codes O10 and O11) Among Women Aged 15-44 Years, United States, 2003-2018

Year	Number of women aged 15-44 years	Non-maternal deaths from chronic hypertension (ICD-10 I10-I15)		Maternal deaths from chronic hypertension (ICD-10 O10, O11)	
		Number	Rate per 1,000,000 women	Number	Rate per 1000,000 women
2003	61,887,915	793	12.8	7	0.11
2004	61,969,393	729	11.8	5	0.08
2005	62,070,636	785	12.6	15	0.24
2006	62,190,028	751	12.1	9	0.14
2007	62,292,084	750	12.0	11	0.18
2008	62,359,858	792	12.7	17	0.27
2009	62,373,024	846	13.6	19	0.30
2010	62,374,964	767	12.3	20	0.32
2011	62,517,048	805	12.9	26	0.42
2012	62,744,930	784	12.5	22	0.35
2013	62,939,772	794	12.6	27	0.43
2014	63,356,565	860	13.6	20	0.32
2015	63,606,765	884	13.9	20	0.31
2016	63,613,014	901	14.2	22	0.35
2017	63,958,243	923	14.4	24	0.38
2018	64,171,698	961	15.0	30	0.47

Data from the CDC Wonder Database. National Center for Health Statistics Mortality. Centers for Disease Control and Prevention. Accessed February 19, 2021. <https://wonder.cdc.gov/Deaths-by-Underlying-Cause.html>

Note: Misclassification of a small fraction of non-maternal deaths from chronic hypertension could result in a substantial change in the rate of maternal deaths from chronic hypertension.

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Appendix 6. Identifying Cases Where the Pregnancy Checkbox Provided the Sole Indication That the Case Was a Maternal or Late Maternal Death

Details of maternal deaths in 2018 including multiple causes of death were obtained from the 2018 Mortality Multiple Causes of Death database. This file was used to first identify maternal deaths and late maternal deaths using appropriate International Classification of Diseases (ICD10) codes in the underlying cause of death field. Entity axis and Record axis data were then analysed to obtain information on multiple cause-of-death diagnoses associated with specific underlying cause of death categories such as ‘Other specified maternal conditions’ (O268), ‘Liver disorders complicating pregnancy’ (O266), ‘Chronic hypertension’ (O10) and late maternal deaths (O96, O97).

These multiple causes-of-death analyses also provide evidence of misclassification of non-maternal deaths (as maternal deaths). Of the 180 deaths due to other specified maternal conditions (ICD-10 O268) in 2018, 143 deaths were identified as maternal deaths based solely on information from the pregnancy checkbox. Similarly, 15 of 30 deaths from chronic hypertension (O10), 23 of 29 cases of liver disease (O266), and a majority of the late maternal deaths (O96, O97) were identified as maternal deaths based solely on the pregnancy checkbox. Multiple causes-of-death diagnoses associated with the above-mentioned 23 maternal deaths from liver disease included alcoholic liver disease (8 cases), hepatic failure (10 cases), and fibrosis and cirrhosis of the liver (4 cases). It is likely that some such deaths occurred among non-pregnant women and erroneous use of the checkbox led to misclassification of these non-maternal deaths.

Data from Mortality Multiple Causes of Death database 2018. Vital Statistics Data Online Portal. National Center for Health Statistics. Accessed February 19, 2021. https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm

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