

Guidance for Use of Connecticut Vital Statistics by Race and Ethnicity Across Data Collection and Classification Changes



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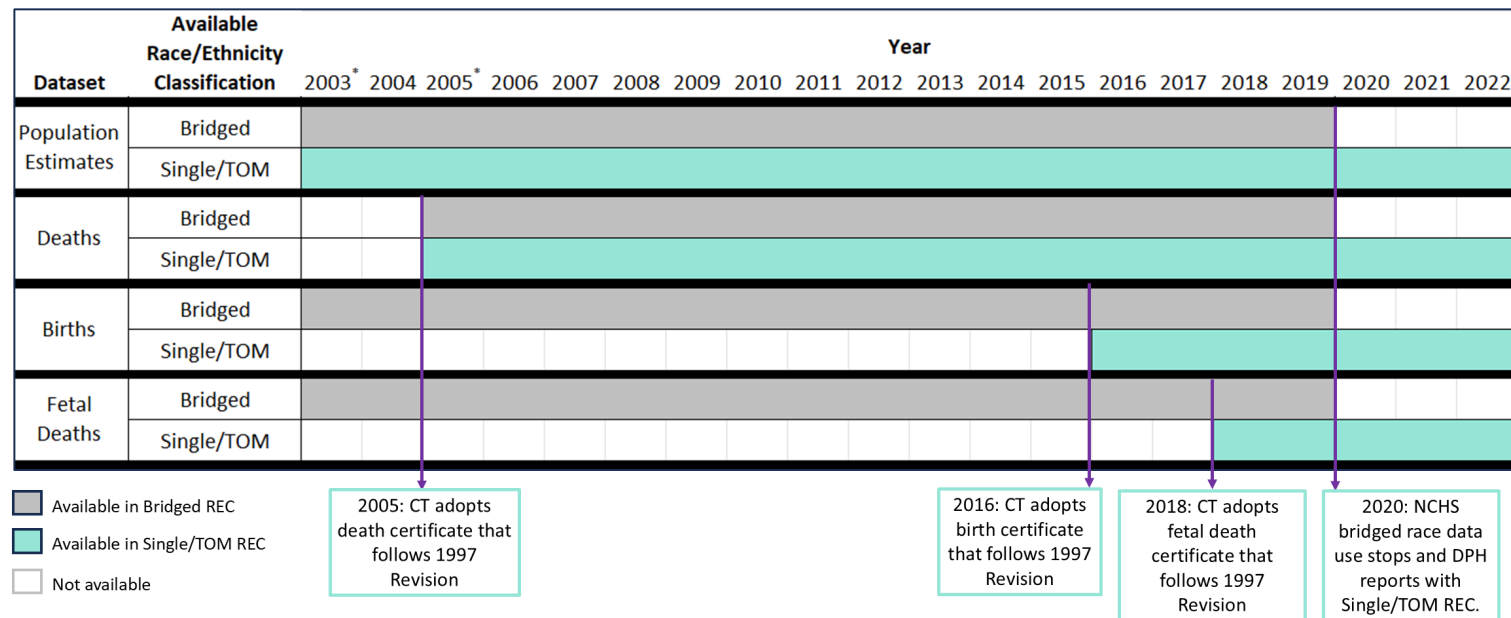
This fact sheet provides technical guidance for users of Connecticut vital statistics interested in aggregating or assessing trends over time by race and ethnicity. The Connecticut Department of Public Health (DPH) adopted the *Race-Ethnicity Classification* (REC) of *Single and Two or More Races* (Single/TOM) for vital statistics data years 2020+. Single/TOM REC differs from the previously-used *Bridged* REC by the addition of a new reporting group, non-Hispanic Two or More Races (NH TOM), and omission of NH TOM data from NH single-race groups (White, Black, Asian, or American Indian/Alaskan Native) to which they would have been re-allocated by the National Center for Health Statistics (NCHS) under Bridged REC.¹ This change, required by updates to state vital certificates from the federal 1977 Office of Management and Budget (OMB) Race and Ethnicity Standard to the 1997 Revised Standard², created a discontinuity for NH single race-group membership over time with potential impacts on data analysis.

Data Availability in Bridged versus Single/TOM REC

Data users seeking to analyze vital statistics before 2020 (the Single/TOM REC adoption year) are advised:

- Data collected 1) based on the 1977 OMB Standard, or 2) during years after 1997 Revision update to vital certificates but before NCHS stopped regularly providing Bridged-race assignments (2019) can be used for reporting by Bridged REC (Fig. 1).
- Only data collected under the 1997 OMB Standard Revision can be used for reporting by Single/TOM REC (Fig. 1).
- Although DPH adopted Single/TOM REC for reporting vital statistics for only data years 2020+, deaths, births, and fetal death data are available by request in Single/TOM as early as 2005, 2016, and 2018, respectively (Fig. 1) and population estimates as early as 2000 (Fig.1; 2000-02 availability not shown).

Figure 1: Availability of population and vital event data in Bridged or Single/TOM REC depends on year of conversion of vital certificates to 1997 OMB Revised Standard and DPH adoption of Single/TOM REC for vital statistics reporting.



*Pre-2003 Birth and fetal death and pre-2005 death data are not used for standard DPH reporting due to quality concerns with some data elements.

¹ SAR, HSS. Connecticut DPH Vital Statistics: Single and Two or More (TOM) Race-Ethnicity Classification, *Fact Sheet*, CT DPH, Hartford, CT; 2023.

² Office of Management and Budget (OMB). Revisions to the standards for the classification of federal data on race and ethnicity. *Federal Register*. 1997;62(210).

Considerations for Aggregating or Conducting Trend Analyses on Vital Statistics Across Bridged and Single/TOM Race and Ethnicity Classifications

Collection of Connecticut vital statistics under the 1977 OMB Standard versus the 1997 Revised Standard and the associated REC reporting change only altered the composition of NH single race groups. Use guidance for data analysts interested in analyzing Connecticut vital statistics for NH White, NH Black, and NH Asian over periods that include timepoints shown in Figure 1 depends on the source datasets for the statistics:

Nativity: Analysis results shown in Table 1 suggest no meaningful difference between rates based on Bridged versus Single/TOM Classification for natality statistics evaluated (those for which numerators are birth counts and denominators are birth or population counts).

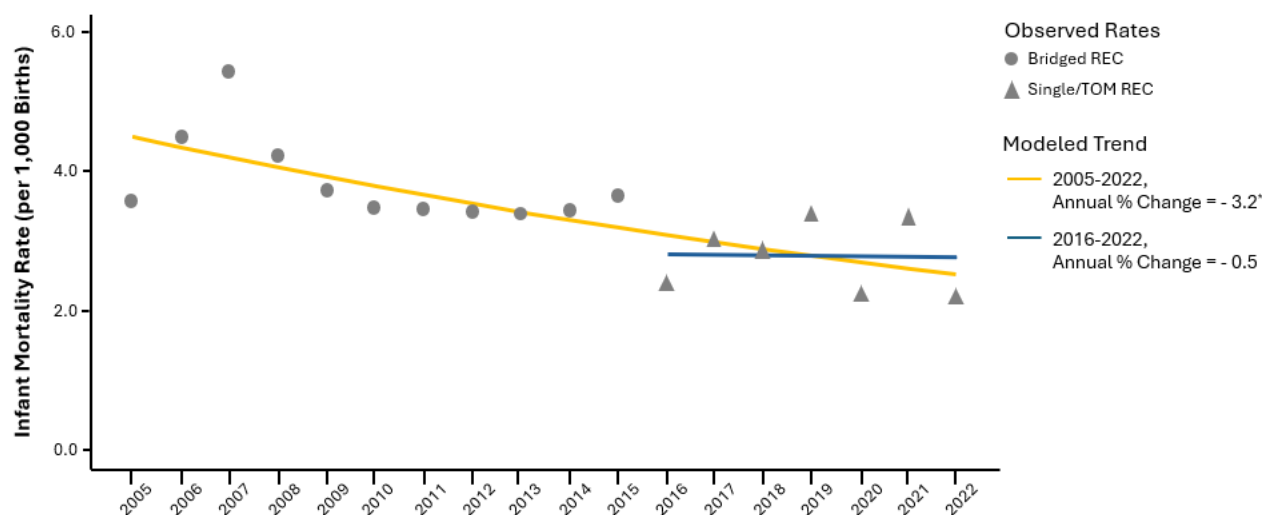
- *Use Guidance 1:* Natality statistics for NH single-race groups can be meaningfully aggregated over years before and after 2016 for most analytical and reporting purposes, indicators shown in Table 1, and for short time periods. Annotation that data are based on combined RECs is advised.
- *Use Guidance 2:* Trends based on data years 2016+ are specific to NH single-race groups as classified by Single/TOM Classification, but statistical power to detect emergent trends are limited by exclusion of historical data years (Fig. 2). See a recent analytical report for more information.²

Infant Mortality: Use guidance for infant mortality statistics *for which numerators are infant death counts and denominators are birth counts* is the same as that for natality statistics. For infant mortality statistics *for which both numerators and denominators are death counts*, see non-Infant Mortality directly below.

Non-Infant Mortality: For all mortality statistics outside of infant mortality (those for which numerators are all deaths except infant deaths and denominators are death or population totals), the transition from the 1977 to 1997 OMB Standard and REC change is not a concern, as data are available in Single/TOM REC starting with data year 2005. For analysis of pre-2005 NH single-race data, for which data quality review is needed, see an NCHS report.³

Fetal Mortality: Small numbers may result in limited statistical power to detect differences in rates between Bridged versus Single/TOM REC using analyses detailed in Table 1. Caution is warranted for conducting trend analyses of annual fetal death rates by race and ethnicity for Connecticut due to small numbers.

Figure 2. Connecticut NH White Infant Mortality Rates are declining according to analysis of 2005-2015 data in Bridged REC combined with 2016-2022 data in Single/TOM REC. However, the rates show no significant pattern of change over the years 2016-2022, when data are uniformly available in Single/TOM REC.²



² Surveillance Analysis and Reporting Unit, Health Statistics and Surveillance Section. 2025. Natality and Infant Mortality Trends in Connecticut by Race and Ethnicity, 2003-2022, *Vital Statistics Report*, Hartford, CT: Connecticut Department of Public Health.

³ Heron, M. 2021. Comparability of Race-specific Mortality Data Based on 1977 Versus 1997 Reporting Standards. *Natl Vital Stat Rep*: 70(3), pp.1-31.

Evaluation of Natality/Infant Mortality Rates Between Bridged versus Single/TOM REC

The availability of Connecticut mortality statistics (except infant) in Single/TOM REC as far back as 2005 resolves concerns over impacts of the change from Bridged to Single/TOM REC on NH single race trend analyses in most cases. However, the limited availability for Connecticut natality and infant mortality statistics in Single/TOM REC to ensure consistent classification of rates for recent trend analyses or aggregation prompted additional evaluation using Comparability Ratios (CRs, *inset*). DPH analyzed rates aggregated 2016-2019, when data were available in both Bridged and Single/TOM REC, for representative natality and infant mortality indicators for NH White, NH Black, and NH Asian. (NH American Indian/Alaskan Native was not evaluated due to exclusion from DPH standard reporting due to small numbers.) **Results showed minimal impact of the REC change for the three NH single races analyzed.** This conclusion was based on:

1. Percent Differences in numerators and denominators for Bridged versus Single/TOM REC rates were uniformly under 7% and mostly under 5% (Table 1).
2. None of the CRs for indicators evaluated were significantly different than 1 ($p < 0.05$). These results indicate that there is no difference in rates between Bridged versus Single/TOM REC for these indicators (Table 1).

Comparability Ratios

A Comparability Ratio (CR) is the ratio of the rate of a health event in a new coding system compared to the old system rate:

$$CR = \frac{\text{Rate (New Coding System)}}{\text{Rate (Old Coding System)}}$$

Evaluation of CRs is a standard approach to assess the impacts of coding system changes on health indicators.⁴

CR = 1 indicates no difference in rates between two coding systems.

Table 1: Comparability Ratios and precursor statistics for representative Connecticut natality and infant mortality indicators*, 2016-2019, used to assess the impact of the change from Bridged to Single/TOM REC.

Indicator	Bridged Numerator	Single/TOM Numerator	Percent Difference	Bridged Denominator	Single/TOM Denominator	Percent Difference	Bridged Rate (95% Confidence Interval)	Single/TOM Rate (95% Confidence Interval)	Calculated CR (95% Confidence Interval)
Singleton Low Birth Weight Rate							<i>Per 100 births</i>	<i>Per 100 births</i>	
NH White	3,255	3,176	2.4%	72,759	71,264	2.1%	4.47 (4.32, 4.63)	4.46 (4.30, 4.61)	1.00 (0.95, 1.05)
NH Black	1,737	1,657	4.6%	17,539	16,466	6.1%	9.90 (9.44, 10.37)	10.06 (9.58, 10.55)	1.02 (0.95, 1.09)
NH Asian	636	619	2.7%	9,405	9,216	2.0%	6.76 (6.24, 7.29)	6.72 (6.19, 7.29)	0.99 (0.89, 1.11)
Singleton Preterm Birth Rate							<i>Per 100 births</i>	<i>Per 100 births</i>	
NH White	4,627	4,505	2.6%	72,747	71,252	2.1%	6.36 (6.18, 6.54)	6.32 (6.14, 6.51)	0.99 (0.95, 1.04)
NH Black	1,840	1,754	4.7%	17,540	16,467	6.1%	10.49 (10.01, 10.97)	10.65 (10.15, 11.15)	1.02 (0.95, 1.08)
NH Asian	631	610	3.3%	9,404	9,215	2.0%	6.71 (6.19, 7.23)	6.62 (6.09, 7.15)	0.98 (0.88, 1.10)
Early Prenatal Care Rate							<i>Per 100 births</i>	<i>Per 100 births</i>	
NH White	65,925	64,727	1.8%	74,723	73,222	2.0%	88.23 (87.55, 88.90)	88.40 (87.72, 89.08)	1.00 (0.99, 1.01)
NH Black	13,764	12,878	6.4%	17,798	16,708	6.1%	77.33 (76.04, 78.63)	77.08 (75.75, 78.41)	1.00 (0.97, 1.02)
NH Asian	8,058	7,906	1.9%	9,622	9,422	2.1%	83.75 (81.92, 85.57)	83.91 (82.06, 85.76)	1.00 (0.97, 1.03)
Infant Mortality Rate							<i>Per 1,000 births</i>	<i>Per 1,000 births</i>	
NH White	232	216	6.9%	76,074	74,758	1.7%	3.05 (2.68, 3.47)	2.89 (2.53, 3.30)	0.95 (0.79, 1.14)
NH Black	170	162	4.7%	18,361	17,277	5.9%	9.26 (7.97, 10.76)	9.38 (8.03, 10.94)	1.01 (0.82, 1.26)
NH Asian	39	38	2.6%	9,773	9,455	3.3%	3.99 (2.92, 5.46)	4.02 (2.92, 5.52)	1.01 (0.64, 1.57)
General Fertility Rate							<i>Per 1,000 population</i>	<i>Per 1,000 population</i>	
NH White	76,074	74,541	2.0%	1,609,780	1,582,303	1.7%	47.26 (46.92, 47.59)	47.11 (46.92, 47.59)	1.00 (0.99, 1.01)
NH Black	18,361	17,231	6.2%	343,501	322,919	6.0%	53.45 (52.69, 54.23)	53.36 (52.57, 54.16)	1.00 (0.98, 1.02)
NH Asian	9,773	9,570	2.1%	178,407	171,260	4.0%	54.78 (53.70, 55.88)	55.88 (54.77, 57.01)	1.02 (0.99, 1.05)

*95% Confidence Intervals of CRs associated with Very Low Birthweight, Teen Births, Neonatal Mortality, and Post-neonatal Mortality (not shown) uniformly include 1.

⁴ Anderson, RN et al. 2001. Comparability of cause of death between ICD-9 and ICD-10; preliminary estimates. Natl Vital Stat Rep: 49 (2), pp. 1-32.

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For additional information, please contact Connecticut DPH Surveillance Analysis and Reporting Unit at DPH.VitalStats@ct.gov.